

Obviously, the above view is an extreme one. Development is not undertaken to provide opportunities to any particular group. It seeks to promote wider national interests for the benefits of all. No doubt those who consider the present manner of development as iniquitous have a point. Their concern for the poor is entirely laudable. But many who see nothing good coming out of development, and have amassed data pointing to its detrimental effects on the lives of the poor only paint a one-sided picture.

In many parts of the Third world degrading poverty is pervasive. Can governments in this context legitimately abandon their development plans simply because things did not always go well in the past? Projects, which cause displacement, are basic to development and poverty alleviation. Without irrigation works, it is impossible to meet the demand of growing populations for food; without hydropower the programs of industrial growth will come to a halt; without transportation and such basic amenities as housing, water, etc. the lives in cities just cannot move on. If, for some reasons the poorer groups suffered in the process far more than others, the mitigatory measures can be incorporated in ongoing and future plans to improve performance. The solution lies in learning from experience and acting prudently, not in throwing up hands in despair and giving up the effort.

Projects to promote development of water, mineral and other resources will continue to impinge on tribal life. But under compulsions of promoting development at a rapid pace this cannot be prevented and need not be lamented provided the tribal people are not made victims but become partners in development whose benefits are theirs to share. That tribal homelands have been ravaged in the past without thought to their sensibilities or welfare does not mean that this must inevitably happen, but that it must not be allowed to happen again. This is possible. To suggest that the tribal people can be cocooned in their pristine state and kept away from development is to treat them as unequal citizens. But they can surely be shielded from economic trauma and culture shock and enabled to develop in a manner and at a pace that avoids social injury. They too want change and improvement without loss of identity.

The fact also needs to be faced that the process of development affects different groups differently. Some stands to gain, while others lose. This seems to be a perennial dilemma in development. But in some ways it should still be possible to harmonize the interests of everybody. As Toye concludes, the "development policy is all about the dilemmas of balancing the gains of one group against the losses of others". Simply because certain human costs are involved in development is no valid argument for giving it up. The question to consider should be: How best to reduce the human costs, so as to make resettlement as painless as possible".

6 **Resettlement:** In the past resettlement rarely worked well. Many failures of these efforts are traceable to administrative weaknesses. Traditionally, project authorities have not viewed resettlement as their responsibility, and tended to dump the job on local authorities. Then, local authorities, on whose shoulders the responsibility for resettlement fell, usually lacked the capacity to cope with such challenges. Their view of the people living in areas of project operations as obstacles to land acquisition, who must be got out of the way as quickly as possible with payment of nominal compensation if necessary, further complicated matters.

(i) By and large, resettlement has remained out of the project preparation, appraisal, monitoring and supervisory processes. The emphasis mostly has been on engineering, finance and such other components. The process of development entailed some social costs of disorganization, dislocation and rehabilitation, but in view of the overall good to the society, these were negligible. Hence the problems of submergence, dislocation, rehabilitation and resettlement were seldom considered as issues.

*TARR AK
is a chapter* Resettlement plans, where developed, were purely ad hoc. They were not based on any detailed planning studies indicating the numbers to be resettled and the cost of resettlement. Often, the plans underestimated the number of people to be resettled. The numbers were based on mere guesswork. In several projects the estimates indicated for populations in need of resettlement were later found to be much lower than actual numbers. Hastily drawn up, these plans without budgets, time tables, institutional muscle, or legal base were of little avail in aiding resettlement.

Examples of underfinanced resettlement plans are not uncommon. Anticipating funding shortage, the project authorities anxious to see that the project got approval, deliberately indicated their requirements for funds on the lower side. When it came to making payments for compensation such plans naturally fell short of their goals.

A major flaw of these plans was that they did not give adequate consideration to people related factors. The affected people - settlers as well as hosts - were usually left out of planning considerations. Often, authorities did not even share with the people information about the project that was going to change the whole pattern of their existence.

In the past, resettlement has often been considered synonymous with compensation paid in cash for the property lost. This scarcely helped in resettlement in the true sense of the term.

- (i) 1. The compensation in cash was payable only to those who had lost their lands, houses or other immovable property. In villages it is only a handful of affluent people who own such property. A majority of people who were forced to move have thus remained uncompensated.
- (ii) 2. The quantum of compensation has on many occasions been arbitrary and certainly insufficient for families to re-establish themselves in new places. On arbitrariness of the people displaced by a dam in North India, it was recently argued: "The compensation was undervalued since their stone structure houses were considered to be inferior to brick houses though in reality they often are stronger and last for generations".
- (iii) 3. The long time-taken to make payment causes enormous hardships to the people who have already lost their belongings but must struggle to re-establish themselves sooner rather than later. It was recently noted: "Compensation payments are sometimes severely delayed which obviously devalues the compensation award". Sometimes payment is made in installments which forces people to stay back in makeshift structures, delaying their move to relocation sites.
- (iv) 4. Lurking in the vicinity all the time are liquor vendors, petty traders and others ready to sell their wares through all manner of enticement, and the displaced people, especially the tribal people, with little experience in handling cash, often lose it on such purchases in no time. In the excitement they forget that the cash is means to sustain them in future. Experience indicates that people tend to spend their monetary windfall on various types of unproductive expenditures. Cash awards do not necessarily restore productivity and well being of the displaced populations.

People-Oriented Approaches to Resettlement: For quite some time now, planners have been aware that a carefully devised approach will be necessary to address the complex resettlement issues. The first steps in formulating a policy were taken by the World Bank in the beginning of the 1980s. Countries facing problems of development related resettlement have also since initiated the process. In India, the States provide in their laws for payment of compensation to development-displaced populations in cash as well as in kind. Provision is also made for awards by the tribunals occasionally set up to deal with the specific project problems. The formal establishment of a national policy on resettlement is currently a subject of discussion in India.

As the World Bank has devoted considerable attention to these issues, a discussion of the Bank policy on resettlement would be appropriate. In 1980 the Bank issued for its staff a statement outlining a policy to guide operations in this sensitive and difficult area with the aim of protecting the interests of populations displaced by development projects. This was for the first time that any major development agency instituted a policy to deal specifically with the problem of involuntary resettlement. For a long time the Bank remained the only international developmental agency with a resettlement policy.

The policy has undergone several revisions. Lessons learnt from the application of policy have provided the basis for these changes. A new, strengthened version of the policy document appeared in 1988. This too has undergone some revision lately, and an updated operational directive came into effect in 1990.

Grounded largely in anthropological research findings and other social science knowledge, the policy was formulated by a Bank staff group. The policy guidelines that have emerged reflect anthropological and sociological thinking. This is evident from the way the process of involuntary resettlement is visualized. As the guidelines see it, the very nature of involuntary resettlement gives rise to special social and technical problems, which are to a great extent different from, and usually more severe than, those encountered in cases of voluntary resettlement. A feeling of powerlessness and alienation is often engendered in those who are relocated, especially when entire communities are uprooted from familiar surroundings. To the extent that pre-existing community groups are dispersed to new locations, social cohesion is weakened, and the potential group action is diminished.

The policy recognizes that in any involuntary resettlement situation the human suffering is inevitable. As its very first requirement, the policy therefore states that involuntary resettlement must be avoided wherever possible. When it is unavoidable, it must be minimized. To encourage exploration of alternative solutions, the bank guidelines require the project preparation teams "to examine, in case of all large construction projects, and determine at the time of identification and appraisal, whether people must be displaced, and, if displacement is unavoidable, to reduce it to a minimum compatible with the purpose of the project"

- (1) ✓ The basic approach is to treat resettlement as a development question. The emphasis is on providing resettled people with new and better economic opportunities. The policy is that the families affected by a bank-financed project should share in benefits from the project and as a result be better off than before. The idea simply is that since involuntary settlement dismantles existing production systems, all resettlement programs must at the same time be development programs. The bank stresses that resettlement operations should not only return resettled populations to their former living standards, but also that, whenever possible, they should improve peoples' welfare in environmentally sustainable ways.

R&FT
⑧ LARR Act
tries to address
these anomalies
and the
impact will be
been watched
for...

Projects have been designed and appraised in the past that made no provision for resettlement. Subsequently when it was discovered that resettlement was necessary, the lack of resources for the purpose only complicated the implementation of otherwise sound projects. In order to prevent the recurrence of such cases, the Bank guidelines insist that the costs of resettlement be included in the overall project costs.

As the resettlement planning decisions impinge on the lives of the displaced groups, agencies concerned are enjoined to encourage community participation in planning and implementing resettlements. A related recommendation concerns the involvement of local groups and non-governmental organizations. Being closer to the people, they are undoubtedly in a better position to articulate resettler's needs and defend their rights.

Effects of the resettler's induction on the host population in the receiving areas are often not given due consideration in the planning process. A sudden increase of population in receiving areas can upset the existing man-land ratio, leading to reduction in the availability of natural resources for hosts as well as resettlers on a sustainable basis. The economic, social and cultural integration of the settlers with the host population cannot be achieved through administrative decrees, but a planning process that takes into accounts the development needs of both the groups can certainly help accelerate it.

The Bank policy regards as of particular importance the welfare and development of the indigenous groups, ethnic minorities and pastoralists whose rights to the land and other resources acquired for the project may be no more than usufructuary or customary. Even without legal title, these adversely affected groups are to be eligible for full compensation as well as resettlement.

Learning from Experience: When resettlement plan is not adequate, development projects that ought to be seen by populations as beneficial instead become rallying points for opposition to government plans. Against the backdrop of similar other experiences elsewhere, the importance of careful preparation of plans for resettlement is coming to be increasingly recognized. Resettlement performance has also lately begun to improve as a result. Experience indicates, however, that some operations have been more successful than others. This means that further improvements in performance are possible provided

those involved in the planning and management of resettlement become willing to use in their operations the new approaches to resettlement. As one observer recently remarked, even the best planned programs carry with them risks for the people who must move but the approaches suggested by adequate research, planning and resources can help relocated communities re-establish with greater confidence.

Development of Forest Policy and Tribes (notes Pg - 70)

There is a symbiotic relationship between the tribes and forests. Forests are closely associated with the tribal economy and culture. They depend on forests for food, fuel, wood, housing material, herbal medicines and fodder for cattle and material for agricultural implements. Their culture is also influenced by forests. They worship many trees.

*✓ forest policy
TSSS*

In the past, the tribes enjoyed considerable freedom in the use of forest resources. They were virtually lords of forests. With the introduction of State management of the forests, particularly since the close of 19th century, the relationship between the tribes and the forests has undergone considerable change. The first national policy on forests was formulated in 1894. It introduced State control over forests in public interest which resulted in the curtailment of rights and privileges of the tribes over the forest resources. The policy also envisaged clearing of forests without any commensurate efforts on their regeneration through plantation programs. The exact impact of the policy was not realized during the pre-Independence period as the forests were in plenty then. It was only after the Independence that the damage caused by the clearing of forests was realized and efforts were made for their economic development. Accordingly, a new forest policy was formulated in 1952 and it recognized six vital needs:

1. Evolution of a system of balanced and complementary land use,
2. Checking of soil erosion,
3. Establishment of tree lands,
4. Creation of small woods for grazing and collecting wood for agricultural implements and fuel purposes.
5. Supply of timber for national needs, and
6. Realization of maximum annual revenue.

The new forest policy was a departure from the old policy of 1894 in the following aspects that are of considerable significance to the tribes:

1. Withdrawal of concessions on the release of forest land for cultivation,
- ✓ 2. Establishment of village forests for meeting the forest based needs of the villagers,
3. Bringing the private forests under the State control,
4. Withdrawal of facility of free grazing in forests and introduction of grazing fee, and
5. Making efforts to wean away the tribes from the traditional practice of shifting cultivation.

As a result of the new policy, the tribes who considered themselves the masters of the forests became their subjects. They were placed under the control of the Forest Department. The traditional rights of the tribes were reduced to mere concessions.

✓ 1952 policy

The new policy classified the forests into four categories:

1. The protected forests which are to be preserved for physical and climatic conditions,
2. The national forests for meeting the needs of defense, communication, industries, etc.,

3. The village forests for providing fuel, timber, grazing and agricultural requirements, and
4. The tree lands for preservation of environment of the country.

However, the functional classification of forests could not be adopted because of their multiple uses. The emphasis continued on regulatory, policing and revenue earning aspects of the policy. The latter resulted in the over exploitation of the forests. The implementation of the policy in practice further accentuated the difficulties of the tribes. The curtailment of the rights and concessions of the tribes very often resulted in conflicts between them and the forest officers.

In the enthusiasm to increase the forest area, the Forest Department claimed the treeless land as forestland. For instance, in Spiti the entire uncultivated area of about 800 square kilometers, with hardly 800 trees, has been declared as a forest area. Similarly, in Rajasthan, Gujarat and Maharashtra large areas of land with hardly any trees have been declared as forest areas. Such areas were traditionally under the occupation of the tribes. They have been declared encroachers in the absence of the record of land holdings and are being harassed by the Forest Department with constant threat of eviction.

The emphasis in the new policy on collection of maximum revenue from the forest resources has led to the involvement of the contractors in various forestry operations. The damage caused by them in connivance with the forest personnel have not only devastated the forests but have also caused uncontrolled exploitation of the tribes. The tribes being ignorant of the laws are completely left at the mercy of the contractors who dictate terms to them for purchase of the forest produce.

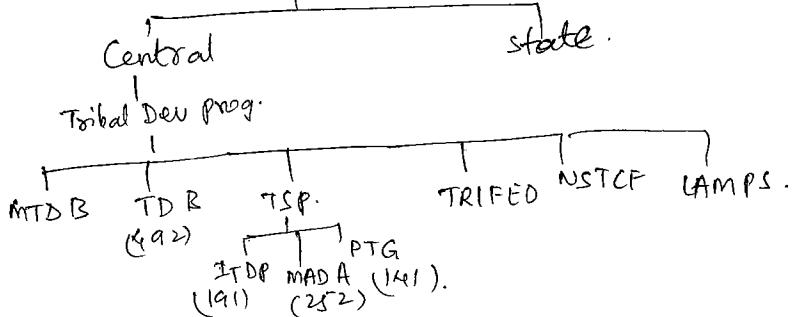
The tribes who had been traditionally recognized as protectors of forests are now branded as its destroyers. They are alleged to destroy the forests for timber and other forest produce. Such charges are laid against them by the contractors to malign them. The tribes have no means of transport, and cannot carry away the timber or any other major forest produce out of the forest. They can only carry fuel wood and other items of minor forest produce on their heads. More often than not, the crafty contractors use them for felling the trees. The tribes in fact do not even get the minimum wages and the contractors with the connivance of the forest personnel reap the real benefits.

Minor Forest Produce (Recent announcement of MSP for MFP is a right step)

① Definition
(See last page)

Minor forest produce provides substantial sustenance to the tribes. In the earlier days it primarily met their personal requirements. But gradually some items of forest produce acquired commercial value; trade in them developed and brought cash income to the tribes. The Forest Department was given the control of the trade. It started the practice of assigning collection of minor forest produce to the traders on payment of a lump sum or royalty based on the quantity collected. The traders generally entrust the collection of the forest produce to the tribes who are paid at the rates fixed by the traders or by the Forest Department. The collection charges are generally very low and the State also gets very little revenue. Many malpractices have crept into the trade. In order to do away with those, some items of the minor forest produce have been nationalized in some states. The states have acquired monopoly rights to purchase the nationalized items. They also fixed their prices. However, the nationalization of minor forest produce has not improved the situation substantially. Under the law only the State can purchase the nationalized commodities. Collection of minor forest produce is done through three agencies, namely, (i) contractors, (ii) co-operatives, and (iii) Government Departmental agency. However, in most cases the collection is done through agents. They are appointed by the State and are generally private contractors. Appointment of such agents solves the problem of quality of collection and its handling, storage, disposal, etc. which otherwise would be the responsibility of the forest Department. The state gets the difference of the collection charges and the final sale price. This has become a main source of forest revenue but it is at the expense of the tribes. The tribes are deprived of the fair market price of the items as the increased price would amount to narrowing the margin of the profit of the state. This arrangement precludes the primary objective of removing the middleman and passing on the maximum benefit to the primary collector.

② MFP economy is fragile, but an estimated 100 million people derive their source of livelihood from collection & mktg of MFPs. (Report of National Committee on which includes significant tribal population) Forest Rights Act, 2011



Anthropology Paper 02 - Volume 03

(5) Major constraints that account for low collection of MFP are

1. Inadequate organization at the grass roots level
2. Inadequate road communication
3. Lack of storage facilities
4. Lack of processing units
5. Short period of collection
6. Financial constraints
7. Lack of technique of collection
8. Lack of knowledge on the economic use of many items
9. Presence of intermediaries who have no interest in the development of the tribes or the minor forest produce.

(6) Recent announcement of MSP for MFP is a right step.

(*) LAMPS - (notes pg-83)

National Level Marketing Organization for Forest Produce (TRIFED)

MFP SAP
Both minor forest produce and surplus agricultural produce are important activities of the Large Area Multi-Purpose Co-operative Societies (LAMPS) and the Tribal Development Co-operative Corporations (TDCCs). About 2400 LAMPS and 12 TDCCs are functioning in the country. However, they have been facing a number of difficulties in the marketing of minor forest produce and surplus agricultural produce of the tribal areas. One of the major difficulties is competing with the vested interest and the market forces. Keeping in view the various aspects, the Government of India established in August 1987 a Tribal Co-operative Marketing Development Federation of India Limited (TRIFED) as a National Level Apex Co-operative Marketing Organization. It would provide support to the State Tribal Development Federations and State Forest Corporations for the interstate and international marketing of minor forest produce and other tribal products. As per the understanding, the responsibility of procurement, transport and marketing in the state, of minor forest produce and other tribal produce will be of the State Federation and their export and marketing outside the state would be looked after by the TRIFED. It is difficult to say how far these organizations would succeed in facing the competition from the vested interest.

There are about 5,000 forest villages in the country inhabited by about 2 lakh tribal families. These villages have not received the benefits of development programs. Their inhabitants are employed as forest laborers by the Forest Department either directly or through the contractors at rates which are much less than the minimum wages. They have not been given rights over the forest lands which have been under their occupation for a long time. They are generally denied fair price of minor forest produce. The Union Ministry of Agriculture had advised the State Governments to confer long-term heritable and inalienable rights to the forest dwellers over the lands under their traditional use. But the response of the State Governments so far has not been adequate.

Tribal Cooperative Marketing Development Federation of India Limited (TRIFED)

(1) The Tribal Cooperative Marketing Development Federation of India Limited (TRIFED) was established in August 1987 by the then Ministry of Welfare, Government of India, under the Multi State Cooperative Societies Act 1984 (which has now been replaced by the Multi-State Cooperative Societies Act, 2002).

(2) TRIFED was established with the basic mandate of bringing about the socio-economic development of tribals of the country by institutionalizing the trade of Minor Forest Produce (MFP) and Surplus Agriculture Produce (SAP) collected/cultivated by them – because tribals are heavily dependent on these

natural products for their livelihood. But in many cases they did not use to get remunerative prices due to middle-men and unscrupulous traders exploiting the naïveté of Tribals.

TRIFED was expected to help tribals by ensuring purchase of their products and that too by paying them remunerative prices. Further TRIFED was required to provide marketing support to State Tribal Development Cooperative Corporations, State Forest Development Corporations and other State level Agencies engaged in procurement of such products from tribals.

(5) The total procurement of both MFP and SAP since inception till June 2002 stood at Rs. 877 crore. TRIFED was expected to perform the MFP operations as a welfare activity and not as a commercial activity. Thus TRIFED was expected to trade in MFP irrespective of the commercial prudence of purchasing goods at cheaper rates and resorting to purchase and sale only to maximize profit.

(ii) Hence losses incurred As a consequence TRIFED suffered cumulative loss of Rs. 92.62 crore till 31.3.2003, resulting in the erosion of a large part of the equity share capital provided by the Central Government.

The Ministry of Tribal Affairs used to compensate TRIFED for the losses sustained by it in MFP operations by way of grants-in-aid under the Central Sector Scheme of 'Price Support to TRIFED'. From 1990-91 to 2006-07, the Central Government had extended a total amount of Rs.51.40 crore under the 'Price Support Scheme'.

(6) Min. of Tribal Affairs extends grants-in-aid to TRIFED under the Central Sector Scheme "Market Devt of Tribal Products".

New Roadmap of TRIFED In the light of the changes in its objective, TRIFED has, for the first time, drawn a comprehensive Road Map for its activities during the 11th Plan period (2007-12). TRIFED would now concentrate on the four following activities only during these five years:

- a. Retail Marketing Development Activity
- b. MFP Marketing Development Activity
- c. Vocational Training, Skill Up-gradation and Capacity Building of ST Artisans and MFP Gatherers
- d. Research & Development/IPR Activity

Broad Categories of Tribal Products being marketed by TRIFED

A general list of items being sold at these shops/outlets are as under :

Tribal Textiles

Tribal Jewellery

Gift & Novelties

Tribal Paintings

Terracotta & Stone Pottery

Natural & Organic Food Products

Metal Craft

Cane & Bamboo

Shifting Cultivation

✓ Shifting Cultivation, commonly called Jhum or Podu, prevalent in humid areas where forests are cleared fully or partially and the biomass is burnt. The cultivation is taken up for limited period and then Jhum land is abandoned to remain fallow for a couple of years to enable it to regain its fertility. The process is repeated after a period of few years. The shifting cultivators are mostly tribes of the hill regions. About 6.4 lakh families are involved in the practice of Jhum cultivation over an approximate area of one million hectares every year. The total area affected by this practice is about five million hectares in 15 states of the country. Shifting cultivation is practiced primarily in all the North Eastern states, namely, Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. It is practiced partially in Andhra Pradesh, Bihar, Madhya Pradesh, Orissa, Kerala, Maharashtra, Karnataka and Sikkim.

✓ Shifting cultivation was the main system of the cultivation in the past on hilly terrains with sparse population. In recent years, due to increase in population and limited availability of land for agriculture, the Jhum cycle has come down to 3 to 5 years from the old cycle of 10 to 15 years. With the increasing pressure of population on land, the Jhum cycle is likely to shorten further, which would lead to unavailability of sufficient time for soil to recuperate its fertility. With the accelerated decline in soil fertility yield per unit of land is becoming progressively lower.

✓ Jhum cultivation is a primitive and uneconomic activity and is not capable of supporting even a reasonable standard of living. The shifting cultivators or Jhumias live a life of less than subsistence level. Jhum cultivation causes deterioration and loss of soil. The problem of soil erosion has assumed an alarming proportion and floods have become an annual feature. In the Brahmaputra Valley alone the annual loss has been estimated to be more than Rs.300 crores. The shifting cultivation has not only become obsolete but is a wasteful activity from ecology, forest and health point of view. The problem needs serious attention. The program for controlling shifting cultivation attempts to provide an alternative source of livelihood to Jhumias, improve their socioeconomic condition and to restore ecological balance in the hill areas.

✓ A strategy has been evolved to deal with the problem. This was a result of careful consideration of reports and recommendations of various Committees and Commissions, namely, the National Commission on Agriculture (1976), Working Group on Tribal Development during the Sixth plan (October 1980), the National Committee on the Development of Backward Areas (1981), Ministry of Home Affairs' Committee on Forests and Tribes in India (1982), Research Highlights on Shifting Cultivation and its Alternatives of ICAR Research Complex, for North Eastern Hill Region, Shillong (1982), the Task Force on Shifting Cultivation in India (October 1983), Working Group on Development of Scheduled Tribes during the Seventh Five Year Plan of Ministry of Home Affairs (December, 1984), the Fifth Meeting of the Board on Shifting Cultivation held at Kohima on 13th February, 1985 and the Open House seminar to wean away shifting cultivators held at Aizawl on 4th and 5th August, 1986. The strategy for control of shifting cultivation involves an integrated program of reclamation and development of land for settlement of Jhumias under regular agriculture, animal husbandry, horticulture and forestry. The problems of Jhum control program are threefold

1. Rehabilitation of Jhumia families
2. Development of their economy
3. Provision of advance technology and capital investment.

All these programs are capital intensive. The Task Force on shifting cultivation (1983) has estimated that taking a perspective of fifteen years, a package of measures for rehabilitation of a Jhumia family would require an investment of Rs. 30,000/- per family on an average in addition to the fund allocated under other programs of the State and Central Government. On the basis of 1983 price norm, it would require an investment of about Rs. 3,000 crores per annum to settle 50,000 Jhumia families. Keeping in view the resource constraints, it would be a difficult task to tackle this problem. The selection of package measures

and priority areas has to be done very carefully. The measures have to be both long term and short term. A beginning has been made by the Ministry of Agriculture on a small scale by earmarking an amount of Rs. 15.crores during 1988-89 as central assistance to nine states of Andhra Pradesh, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Orissa and Tripura. About 27,000 families are to be rehabilitated under various schemes. Rehabilitation of shifting cultivators would have to be closely monitored by the administrative agencies and there should be a periodical review of the progress at various levels.

Forest Policy of 1988

Roy Burman Committee - 1988

Over the years, the forests in the country have suffered serious depletion. The situation has been reviewed. In order to provide protection and development to the forests, the old forest policy has been revised in 1988. The new forest policy which was adopted on December 7, 1988, takes into consideration the symbiotic relationship between the tribal people and forests. It envisages that all the agencies responsible for forest management including the Forest Development Corporations should associate the tribal people closely in the protection, regeneration and development of forests as well as in providing gainful employment to the people living in and around the forests. The policy also concedes that life of the tribes and other poor people living within and near forests revolved around forests. The rights and concessions enjoyed by them should be fully protected. Their domestic requirements of fuel wood, fodder, minor forest produce and timber should be the first charge on forest produce. The new forest policy, if implemented sincerely, would protect the tribal interest and also the forests.

Scheduled Tribes (Recognition of Forest Rights) Bill, 2005

The rights of the forest dwelling Scheduled Tribes (FDSTs) who are inhabiting the forests for generations and are in occupation of forest land have not been adequately recognized so far resulting in historical injustice to these forest dwelling Scheduled Tribes who are integral to the very survival and sustainability of the forest ecosystem.

Background / Impetus

- Scheduled Tribes are living in forests for generations and are integral to very survival and sustainability of forests:** It is well known that the forest dwelling scheduled tribes, from times immemorial, are residing in their habitat for generations and there exists a spatial relationship between the forest dwelling scheduled tribes and the biological resources in India. They are integral to the very survival and sustainability of the forest ecosystems, including wildlife. In fact, the tribal people are inseparable with the ecosystem, including wildlife, and cannot survive in isolation.
- Non Recognition of their rights during the process of consolidation of forests:** The traditional rights of FDSTs on forest lands were, however, not adequately recognized and recorded in the consolidation of state forests during the colonial and independent India though Indian Forest Act 1927 had provided for the determination of rights. However, the reservation processes for creating forest areas coupled with historical factors prevalent at that time in respect of excluded and partially excluded areas and emphasis on production forestry somehow left the bona fide interests of the tribal community unrecognized and recorded. The problems of these communities were further compounded after passing of the Forest (Conservation) Act, 1980 when even the development activities in their habitations were termed as non-forestry activities. They still do not even have a homestead and as such address of their own. They are people without identities.
- Permanent threat of eviction from their own land:** The non-recognition of the rights of the FDSTs over land who have been living in forests since time immemorial has been attracting public attention since pre-independent India. Due to non-recognition of forest rights of FDSTs, who have been very deeply rooted in the forest areas for ages, have come to be erroneously looked upon as encroachers of forest lands and the threat of eviction consistently looms large in their psyche. Insecurity of tenure and fear of eviction from these lands where they have lived and thrived for generations are perhaps

the biggest reasons why tribal communities feel emotionally as well as physically alienated from forests and forest lands. All these factors have resulted in historical injustice to them.

4. **Non-Conferment of ownership rights over MFP in terms of Provisions of PESA, 1996:** Inadequate implementation of the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996, by non-transfer of control/ownership over the natural resources, including the Minor Forest Products to the local communities and by non-extension of PESA Act to the entire scheduled areas, including forest areas, have further compounded their miseries. Although the provisions of PESA Act gives the rights of ownership of MFP to the respective local communities, the collection and trade of most of the high value MFP is largely monopolized by the Corporations of the Forest Department of the States and poor FDSTs are just employed by the contractors only as wage earners.
5. **Fruits of Development Schemes denied:** The condition of the FDSTs traditionally living in their habitat in symbiotic relationship with the ecosystem is further becoming far more precarious and vulnerable due to displacement threats in view of ever increasing demand for conservation of forests on one hand, and tardy implementation of developmental activities for welfare of FDSTs on the other, which is mainly due to non-availability of clear cut title of land in their favor. The poor FDSTs living in forestlands for ages could take benefits even under various schemes of the Government such as "Indira Awas Yojana".
6. **Existing Legislative / Policy Frame of the Ministry of Environment and Forests:** The Government has been taking a consistent view on this central theme of integrating FDSTs living in and around forests into every aspect of managing forests. All policy statements, including the Forest Policy, 1988, circulars and guidelines issued by the Ministry of Environment and Forests have been espousing the cause of tribal communities and emphasizing the need for putting these communities at the centre of any conservation measures. Relevant excerpts from some of the important policies of MOEF are...
 - e. The Forest Policy, 1988 stresses that forests are a first charge to the tribal communities and their domestic and livelihood needs are paramount and superior to any other commercial needs.
 - f. The National Forest Policy of 1988, while recognizing the symbiotic relationship between tribal people and forests, also safeguards the customers rights and interests of the tribal people and forest dwellers on forest lands
 - g. The same policy provided for the association of tribal people closely in the protection, regeneration and development of forests with a view to provide gainful employment to the people living in and around the forest, with special attention to...
 - h. Replacement of contractors by tribal cooperatives
 - i. Protection, regeneration and optimum collection of MFP along with institutional arrangements for the marketing of such produce
 - j. Development of forest villages on par with revenue villages and family oriented schemes for improving the status of the tribal beneficiaries
 - k. Undertaking integrated area development programs to meet the needs of the tribal economy, but the fact remains that most of the high value MFP are monopolized by the State Forest Corporations and the tribals are just employed as daily wagers.
 - l. In order to fulfill the commitments as enshrined in the National Forest Policy, 1988, the Central Government in the Ministry of Environment and Forests had issued six circulars for settlement of disputed claims. As per these circulars, the pre-1980 encroachments on forest lands were considered eligible for regularization provided the State Governments had evolved certain eligibility criteria in accordance with the local needs and conditions and had taken a decision to regularize such encroachments but could not implement their decision either wholly or partly due to enactment of the Forest Act 1980.

- m. The Draft National Environment Policy 2004 states that "give legal recognition to the traditional rights of forest dwelling tribes. This would remedy a serious historical injustice, secure their livelihoods, reduce possibilities of conflict with the Forest Departments, and provide long-term incentives to the tribal to conserve the forests".

It is in this backdrop that the historical rights of the FDSTs had not been recognized despite all the legislative and policy framework of the Ministry of Environment and Forests, a decision was taken that the Ministry of Tribal Affairs would take steps to formulate a comprehensive Central Legislation to redress the historical injustice done to the tribal community and for clear assertion of their legal rights on land.

Accordingly, a Technical Support Group (TSG) comprising the representatives of the Ministries concerned and some reputed experts having rich experience and deep association with the cause of environmental protection and welfare of tribal people was constituted, under the Chairpersonship of Secretary, Tribal Affairs to formulate the Scheduled Tribes and Forest Dwellers (Recognition of Forest Rights) Bill.

After a series of meetings and deliberations, a draft Scheduled Tribes (Recognition of Forest Rights) Bill, 2005 was formulated by the Ministry of Tribal Affairs and circulated amongst the ministries concerned for their comments.

Main Features of the Draft Bill

(FRA - Target Material - page - 78) - (Critique of FRA notes pg 72)

Objective: The objective of the Bill is to undo the historical injustice by recognizing and vesting the forest rights and occupation of forest land to forest dwelling Scheduled Tribes who have been residing there for generations and who are integral to the very survival and sustainability of the forest eco-system, including wildlife, but whose rights could not be recorded.

The Rights of the Forest Dwelling Tribes: The bill in Section 4 seeks to recognize and vest Forest Rights to FDSTs where they are scheduled. These rights include...

1. To hold and live in the forest land under the individual or common occupation for habitation or for self cultivation for livelihood by a member or members of a forest dwelling Scheduled Tribe;
2. Right of access to, use or dispose of MFP;
3. Other rights of uses or entitlements such as grazing (both settled and transhumant) and traditional seasonal resource access of nomadic or pastoralist communities;
4. Right of habitat and habitation for primitive tribal groups and pre-agricultural communities
5. To be exercised for bonafide livelihood needs and not for exclusive commercial purposes;
6. Not to exceed 2.5 ha per nuclear family of the FDST; Modified to 4 hectares
7. To be heritable but not alienable or transferable;
8. To include the responsibility of protection, conservation and regeneration of forests;
9. To be registered jointly in the name of the husband and wife when it is in respect of land where a title is vested or recognized;
10. To include traditional and customary rights.

The Bill further provides that no FDST shall be evicted or removed from forest land under their occupation till the recognition and verification procedure is complete.

The Duties of Forest Right Holders include responsibility of not carrying out any activity that adversely affects the wild life, forests and biodiversity.

The Authorities and their functions include Gram Sabhas, Sub-Divisional Level Committees, District Level Committees having forest, tribal welfare and revenue officials as members.

Offences under the Act: Detailed provisions for penalty for contravention of the provisions of the Act and also the offences by Government authorities have been provided. A simple imprisonment up to 30 days with or without a fine of Rs. 5000/- has been considered appropriate and in addition, the Bill provides for de-recognition of forest rights if the offence is committed more than once.

The Nodal Agency shall be the Ministry of Tribal Affairs or any other officer or authority authorized by the Government of India in this behalf to implement the provisions of the act.

Analysis of the Draft Bill:

A closer look at the Bill reveals that it has provided for a number of checks and balances...

1. Recognition of Forest Rights of only the FDSTs, where they are scheduled; there is no distribution of land involved at all and the Bill will not cover the entire 8.2% of the ST population. Only tribes scheduled for the area living the forests will benefit. A tribal from an outside area / state will not benefit. The Bill in actual terms will only benefit the tribal population on "as is where is basis". Only occupations as per the ground situation existing for generations are being given legal recognition so as to avoid day to day harassment by the officials.
2. Recognition of the occupations existing prior to cutoff date and maximum up to 2.5 ha land only is proposed, which in fact restricts land grabbing by elites even within the tribal communities.
3. All rights would be heritable but inalienable or non-transferable.
4. The use of the forest rights has been restricted to the subsistence and livelihood needs alone.
5. The commercial use of any kind has been specifically excluded.
6. A cutoff date of 25th October, 1980 has been provided by the Bill. It is only a one time exercise to recognize the age old occupations as per the ground situation intended to put an end to so-called issue of encroachment forever. There is no question of abetment of fresh encroachment.
7. It has been provided that the forest right holder shall not indulge in any activity that adversely affects the wild life, forest and the biodiversity in the local areas.
8. The involvement of democratic institutions like Gram Sabhas is in tune with the provisions of PESA Act, 1996 and aims at empowering the local communities in management of their natural resources.
9. Specific provisions have also been made in that the rights so recognized would include the responsibility of protection, conservation and regeneration of forests.
10. There is no move to convert forest lands into agricultural holdings. The vesting of rights would be done on "as is where is basis" and definitely no clearing of forests or felling of trees would be permitted.

Concluding Remarks

The proposed new law to recognize and protect the rights of tribal people living in forests is an important step in the right direction. In much of the mainstream media today, the concerns of environmentalists and the so-called "nature lovers" are shown to be opposed to those of people who live in and around forest areas, whether it be in terms of protecting animal wildlife or preserving tree cover.

Typically, it is the local communities who are blamed for deforestation or for the destruction of natural habitats, despite the overwhelming evidence of the negative role played by commercial logging and mining interests. But this is really a major misrepresentation, since the local communities who live in and around forests are usually those who are most concerned with preserving them. And where there has

been more evidence of devastation, it has more often than not been the result of a nexus between business interests and local officialdom and politicians.

The problem is that even those who are officially in charge of dealing with these issues, say, for example, the Forest Department, are not adequately informed of the ground realities with respect to what is forest and what is not. The official data on forest cover in India is in a state of utter confusion, which actually dates from the colonial period. At independence, 26 million hectares of land was declared as forests, but without any proper survey. Now the forestland is estimated to be as much as 78 million hectares, again without proper survey, partly because in 1952 all wastelands were also declared to be forests.

Within all this supposedly forest area, there were substantial swathes of land which were actually being cultivated even then, and continue to be cultivated today. This included not just areas of shifting cultivation, but also perennially cultivated tracts. Some forests were no more than patches of trees situated within the cultivated area of villages. There was some ongoing survey work, but it was very unsatisfactory because it was haphazard, had no mechanisms for cross-checking and was completely non-transparent.

These contradictions were made even more acute in 1980 when the Forest Conservation Act stopped even the limited and inadequate official surveys. The current official description of the extent of encroachment is, therefore, based on extremely problematic and unsubstantiated guesstimates.

According to the Forest Survey of India, in 2001 the total forest cover of the country was only 67.53 million hectares, and this even includes plantations, groves, and so on. Even if all this forest cover is inside state forests, which it is not, at least 12 percent of the land classified as state forests has no forest at all. In some states, the percentage is remarkably high. In Himachal Pradesh, for example, 61 percent of the area that is described as state forest has no forest cover, while in Rajasthan the percentage is 49.

This is largely because wastelands are being classified as forests, but it also reflects the inadequate nature of the data collection. Even official data show that 83% of the forest blocks in undivided Madhya Pradesh were never surveyed. Indeed, the confusion is such that, for India as a whole, the area under non-forest cover is seven times larger than the areas under so-called encroachment.

What all this means, of course, is that the traditional land rights of many people who have for generations lived and tilled the land in some of these official forest areas are not being recognized. These are mostly tribal groups, but also include some non-tribal communities. The absence of proper surveys even in the past makes it easier to declare such people to be encroachers even when they have been traditionally involved in cultivation in these areas.

Legal judgments have not helped to reduce the confusion: the Supreme Court stayed the regularization of land and stopped recognition of pre-1980 settlers who were thereby classified as encroachers. Worse still, in May 2002 the government misinterpreted a Supreme Court ruling to issue a directive to all State Governments to evict encroachers from all forests immediately. A massive eviction drive ensued, which targeted forest communities rather than the commercial and mafia interests which have actually led to the destruction of forests. This has led to huge dislocation and suffering among already impoverished people. Lakhs of families have been rendered homeless and there were many recorded cases of excessive violence. There have been civil disobedience movements across the tribal India.

The Scheduled Tribes and Forest Dwellers (Recognition of Rights) Bill, 2005 is extremely important not only for providing justice to forest dwellers but also for conserving the forests themselves. There are two critically important aspects of this Bill: it recognizes communities' rights and it also democratizes the system of forest conservation. Both are important to maintain the health of forests and forest communities. Essentially all that the proposed law requires is that the Forest Department updates its land records to recognize what already exists on the ground. At the same time, it also requires forest rights holders to refrain from any activity that would adversely affect the forest and the biodiversity in the local area, and also enjoins the local community to stop any activity which adversely affects wildlife, forests and biodiversity.

(If on In impact see next page.)

For both In & Un
Only notes Pg - 74

+ Muni notes - pg 398

refer Pg - 253 for

Anthropology Paper 02 - Volume 03

Impact of Urbanization and Industrialization on Tribal Populations

- ✓ Urbanization is a process of social and cultural change in which the tribal and the rural India is gradually changing towards urban centers. This is because of the planned change induced by the five-year plans of the country. Urbanization in tribal India has a social dimension caused by the problems of culture contact with the tribes who were living in remote areas surrounded by the forest or at the top of the hills. But after independence it was desired constitutionally that the tribes should be brought into the mainstream of the country. Various developmental measures taken for the upliftment of tribal India caused more problems than benefiting the target groups. This does not mean that urbanization is not at all required in the tribal areas, but it is required with planning and anthropological insight and strategies. The overall impact of urbanization is clearly visible in the tribal sector. It has changed the pattern of living of the tribes in the country.

All those forces, external or internal, which broke the isolation of the tribal and the village communities and helped to bring over a change, however slight, in the traditional social order paved way for urbanization and industrialization. For, industrialization does not merely refer to the use of large and complicated machinery, and urbanization does not only mean that a great concentration of the human beings in small areas, they both require certain types of socio-economic relationships which are in conflict with the traditional social order (M.N. Srinivas).

The isolation between different areas, both rural and tribal, was broken down by the constructions of the roads and the development of communication. A uniform civil and criminal law was introduced during the British period and many measures were taken to improve the public health systems. Western education was introduced and many customs were abolished. These measures had a profound effect on the social life of the people. The establishment of the British rule in India meant that every village or other area, however remote, became a part of the widest political community. This was soon followed by the extension of the economic network, which spread over the whole world including India. The cotton famine and the civil war in US made the British manufacturers have wisdom of an alternate supply of cotton in India. The development of cotton as a cash crop effected the peasantry in several parts of the country. It brought money to the villages and tied up the fortunes of peasantry with events happening 5800 miles away, and over which they have no control. An expanding economy brings money to more groups and occasionally to the groups which are very low in the social hierarchy. When the groups low in caste hierarchy Sanskritise their way of life, certain amount of disturbance occurs in the social system.

The politico-economic forces released during the British brought about greater mobility in the caste system. If there is a stimulating urbanization and industrialization of the tribal and rural areas, extra agencies play a very crucial role. Urbanization has brought a change in the life style of the people and which also led to a change in the food habits and the dress. Allied changes have also occurred in their religious beliefs, worldviews, ethos etc. The process of urbanization has made them tolerant towards other religions. The tribal people in urban areas are no longer interested in their traditions to be maintained. Living together has inculcated tolerance for other sects and they are extending a helping hand to the followers of other sects even in matters of construction of sacred places.

✓ Urbanization has also greatly influenced their ecology. The employment pattern and occupation pattern in tribal India have also undergone change owing to urbanization. Instead of traditional employment and occupational pattern they preferred to work in offices, factories, workshops etc. The traditional craftsmen like carpenters and blacksmiths have left their traditional occupation and are working in government and private offices and factories that have nothing to do with their traditional skills. Most of them have even lost their traditional capabilities completely. Urbanization has a deterrent impact on the lifestyle, religion, political, social and economic life in tribal India.

It is evident that the Central Indian Tribal belt standing across the states of Bihar, West Bengal, Orissa, M.P. A.P. has been burgeoning into a zone of intense industrial and mining activities in the recent decade. Many industries and a chain of mining complexes have made considerable appearances and impact on the tribal life. A hoary agro-forest traditional culture has been confronted with a modern sophisticated

industrial culture. This abrupt juxtaposition has produced deleterious results for the tribes. There has been a large-scale alienation of tribal land for the public and private enterprises. Having lost the basic resources, the tribes and rural masses have not been able to secure an alternative source of livelihood. The first generation has found it nearly impossible to imbibe the skills and culture of the industrial age. It is obvious that the shock impulses generated on account of the imposition of the modern industry have been beyond the absorption capacity of the tribal and rural communities. In fact for the first generation, it has been an unmitigated disaster in as much as it has meant nearly a wholesale destruction.

The expectation that the industrialization of tribal areas and rural areas would help in improving the economic conditions of the tribal communities has proved to be largely illusory. Major industrial projects located in tribal territories, far from generating employment for the tribes, have operated to their detriment by uprooting them from their living and offering them no satisfactory alternative to their traditional methods. The attitude of projects officials has been that their responsibility to the tribes and rural folk ended with the payment of the compensation for the land acquired from them. The meagre cost compensation is soon flattered away on drinks and user products, and destitution is the price the poor tribes have to pay for the establishment of an industry in the areas inhabited by them.

Only 09

Further, no space is provided to the tribes and rural folk in the newly constructed township of the projects. They are left to construct and inhabit the dirty slums on the outskirts. These areas are without any civic amenities like tap water, garbage disposal, drainage etc.

*Impact
Industrialisation*

(i) Industrialization has disturbed the peace of tribal and rural India. There is a problem of cultural adjustment for the tribes. The tribes are accustomed to seasonal or agricultural labour, but owing to industrialization, they have to work around the year. Industrialization has broken the joint family system prevalent in rural India. Nuclear families are now predominant. Traditional authority of the elders in the family has been considerably weakened. The industrialized tribes and rural folk are abandoning traditional norms and practices. Tribes and villagers are generally advancing towards integration with the general mass of people but at the same time they are rapidly losing their traditional socio-cultural characteristics. In the traditional agrarian economy the family was functioning more or less as a unit of labour, however, in the factories it is the individual who is wanted. From the membership of a close society a tribal individual is induced to accommodate himself in a universal pattern of cosmopolitan society without education, equipment and resources. There is a crisis of identity. Industrialization has bred new drinking habits, prostitution, feuds, unionism, unemployment, migration and loss of agricultural land in tribal and village India.

*7 points
on 89-253*

The question whether industrialization planned for tribal and rural areas should not contend with the human sacrifice involved acquires significance. Should not the interests of the men and women be safeguarded therefore?

It is clear that we cannot keep in check the advancing tide of industrialization. Nevertheless, we can soften the rigors of new alien climate. The tribes can be prepared before hand to participate in industrialization or as an alternative to make gainful living. But no step should be taken which would lead to the destitution of masses. No project should be proceed without a complete analysis of the future of local communities based on study of all related aspects like the present socio-economic status, cultural profile and anthropology of perspective development by an inter-disciplinary approach.

We shall examine some specific consequences of both Urbanization and Industrialization in greater detail.

IMPACT OF INDUSTRIALIZATION

The social relations found in the modern industrial society are very complex and intricate compared to the simple and straightforward social relations found in the ancient societies. Industrialization has affected the society in every respect. The aspects of industrialization are intimately related with scientific processes. Therefore, the attitudes of the members of industrial society become scientific. People accept and demand rational explanations for every phenomenon. Reason, and not faith, is the touchstone of

every action and belief in the industrial society. The freedom of thought and individualism are the cornerstones of the industrial society.

Impact on Marriage: The institutions of marriage and family have undergone change as a result of structural processes initiated by industrialization. Traditionally the Indian society has recognized marriage to be a sacred institution and in the modern industrial society it was reduced to a contract. In the past, marriage was considered to be a permanent and inalienable bond which could not be terminated at will. But now, under the impact of industrialization, divorce and marriage go side by side.

With the impact of industrialization, the age at which marriage is contracted has increased. Moreover, the aim of marriage in India is no longer spiritual and hence many young men and women in big towns prefer to live single. The institution of marriage has been reduced to a mere device of satisfying one's sexual need and because this biological need can also be satisfied out of wedlock, marriage is no more important.

Since industrialization has now provided many platforms on which a man and woman can meet, interact, and exchange ideas and opinions, the traditional practice of the family elders selecting the spouse for their younger generations is gradually loosing its significance.

The industrial society perpetuates the philosophy of Individualism. Due to his feature, there are more chances of mental and attitudinal discordance than concordance between the husband and the wife. This resulted in an increase in the rate of divorce in the institution of marriage.

Impact on Family: Industrialization has been responsible for a change in the functions of the family. Numerous functions which were hitherto handled by the family are now taken up by other secondary institutions in the society. Traditionally, the family used to be a centre of birth, rearing and education of children. But in an industrialized society, the family is not required to fulfil these roles. Even the traditional importance accorded to the family kitchen is lost in the modern industrialized society.

The traditional and ideal family system of India, the Joint Family, is also subjected to change. As a consequence of industrialization, the joint family setup is breaking down and is being replaced by the modern nuclear family. For details, refer to the chapter on joint family.

Industrialization results in the increase of standard of living. Obviously, it is always not tenable to maintain such a standard in a big family. Hence indirectly, industrialization has been responsible for the families to be smaller compared to the traditional gaiety associated with a big family. The prevalence of the modern birth control measures has also been responsible for the prevalence of small families.

Industrialization has been responsible for the changing status of women in the society. Earlier, from both the economic and social points of view, woman was traditionally a subject of man. She enjoyed no independence at all. Industrialization had a profound impact on all these spheres of the traditional status of women. It makes the woman more independent economically and this results in their social independence also. They are made equal partners with their husbands in the decision making process. Moreover, a woman today is asserting her independence by defying the traditional laws of the society.

The traditional family is now disintegrating, as a consequence of industrialization, due to the increased spirit of individualism. This disintegration is also because of the continuous conflicts and tensions in the household, between different members constituting it.

The traditional Indian family used to nourish the principles of religious and spiritual ideals. The elders were accorded respect and the individual's goals were integrated with the familial goals. But as a consequence of industrialization, these traditional familial goals were also subjected to change.

Impact on Caste System: Industrialization has also brought in a considerable change in the field of social stratification in India. In the traditional Indian society, social stratification was based on the principle of ascriptive status, i.e., birth, closely guarded by the principles of Purity and Pollution, which is popularly known as the Caste system. Industrialization brings in new dimensions to social stratification, which now is based on the principles like occupation, education and income.

Institutions like Tajmari system have disintegrated ; festivals, rituals less observed

④ Impact of Industries on Environment

Anthropology Paper 02 Volume 03

Industrialization has thus resulted in the disintegration of the traditional caste system in the country. It led to the collapse of the traditional caste-based structure of the society. The caste-based criterion of the social classification has changed. In the modern industrialized society, it is the class and not the caste which fixes the social status of the individual.

The traditional social structure has been responsible for the dominance of certain privileged castes. Even this traditional hold of certain castes on the Indian society has gradually reduced as a consequence to industrialization. At the same time, the lower castes, who were hitherto occupying the status positions which made them deprived of all the social and economic developments, were raised in their positions in the society, as a result of economic and social independence the process of industrialization has provided for.

Apart from this, the traditional division of labour, which was based on the concept of purity and pollution and hereditary specialization, has also been changed by the impact of industrialization. This led to the abolition of the caste based functions.

As a result of Industrialization, the spectre of untouchability is relaxing its grip upon the thought and imagination of people of India. Industrialization compels people to work together irrespective of their caste backgrounds or affiliations. In fact, industrialization has indirectly been responsible for the prevalence of inter-caste marriages.

4 Impact on Religion: Industrialization perpetuates the spirits of rationalism and scepticism in mankind. For material progress, superstitions are a hurdle. The process of industrialization helps the spread and dissemination of scientific knowledge and practical reality. This philosophy subverts religious orthodoxy and superstitions.

As a result of industrialization, the outlook of the general masses in respect of religion has become broad. As a consequence of industrialization, the persons of different faiths come together and get an opportunity of knowing and understanding each other. This results in dispelling wrong notions about other faiths and an appreciation of basic unity of all faiths. Therefore, as a result of industrialization, there is a development of religious tolerance. Industrialization, on a broader scale of religious tolerance, leads to the constitution of secular states, as against the earlier theocratic states.

Impact on Moral Aspects of People: Industrialization brings about a change in the moral aspects of the general masses. It results in the development of rational and materialistic outlook, individualism, permissiveness in sex, increase in crimes and loosening of traditional social control mechanisms.

IMPACT OF URBANIZATION

The rural and tribal societies are necessarily dependent on agriculture and allied activities. But as a result of increased contact with the urban centres, this means of livelihood is forsaken by many in the lure of better prospects in industry.

Then, on the other hand, there is an influx of urban communities in the rural market. The rural folk accept the new products like consumer durables or labour saving devices.

Urbanization necessarily involves the movement of a major population to urban centers. These migrants bring back with them new way of life, culture and thinking. These introduced influences of urbanism affect the majority of the rural population and the tribal folk. The entire social structure of the rural community suffers a change. Economic relations, neighbourhoods, universality of human actions, brotherhood doctrines are thrown open to the gullible masses. As such new classes and status functions are derived in the social life. Hereditary leadership gives way to rational leadership based on legality and authority as well as on voting choice.

New forms of mass media like Radio, T.V. newspapers, magazines etc. are available to the rural folk who are influenced by these to a great extent. Individualism creeps in gradually replacing the age old collective

consciousness. Religion is less primitive, more rational. There is no more an inhibition of personality building.

The social consequences of Urbanization are discussed in detail hereunder.

1. **Decline in Social Sympathy:** The first consequence in overcrowding and increasing population is the decline in fellow feeling and sympathy.
2. **Lack of Social Control:** With the decline in the fellow feeling, sympathy and concern for others, there is also a decline in social control. There is a decline in the control of the family and caste on the behaviour of the individual. Apart from this, there is a decline in the control of religion on man due to the ever increasing philosophy of materialism.
3. **Change in the Status of the Women:** This is because of the social and economic independence women acquire as a result of change.
4. **Changes in the Institution of Marriage and Family:** This is due to the reasons already elucidated earlier.
5. **Superiority of Male Ratio in the Population:** This is due to the male dominance in the field of economy.
6. **Commercialization of Entertainment:** The family has lost its function of being a place for recreation and entertainment.
7. **Scarcity of Living Accommodation:** Due to the ever increasing urban areas and its population.
8. **Development of Slums:** A direct consequence of the scarcity of living accommodation.
9. **Change in moral values:** Due to the same forces generated by the process of industrialization.
10. **Breakdown of Joint family:** Due to increase in migration from rural and tribal areas to cities.
11. **Increase in the Incidence of Crime:** Urban centers perpetuate the manhood that is unquestionably brutalized, women dishonored and childhood poisoned at every source.
12. **Corruption, Conflict and Competition:** Due to imbalances in supply and demand.

- The attitude of people towards untouchables has not changed even today.
- The whole movement for the removal of untouchability is a movement for establishment of universal brotherhood & nothing less.

Anthropology Paper 02 - Volume 03

7.1 Problems of Exploitation and Deprivation & Constitutional Safeguards

Problems of Exploitation and Deprivation of SCs, STs and OBCs

Who are the Shudras and when and what brought the condition of degradation to them? The Vedic literature, which mainly includes the Vedas, the Brahmanas, the Aranyakas, and the older Upanishads, do not provide any evidence that the "Shudra Caste" existed in the early period. The Rig Veda only refers to the three Castes of Brahmin, Kshatriya and Vaishya in the Aryan community. It seems that the "caste of Shudras" was created by the Aryans in the closing phase of the Rig Veda. However, there are scholars like Apte and Dutt who contend that the class of Shudras was known from the time of Rig Veda. The non-mention of the word Shudra does not argue for its non-existence. In the Brahmanas however we find a repeated reference to Shudras along with Brahmins, Kshatriyas and Vaishyas forming the integral part of the Indo-Aryan society. The texts of the Brahmanas assign to the Shudras (Dasas) the lowest position and mention them as the people outside the fold of the Brahminical sacrificial religion. This is perhaps because they were racially and culturally different from the Aryans and opposed them as far as their religion was concerned. According to Kamble, they not only opposed the gods of Aryans but also did not perform sacrifices and gave no gifts to the priests. The terms and epithets used by the Aryans for the Dasas were "Anyavrata", "Anasa" and "Mridhravaka". In the matters of social privileges and religious rights, therefore, the Shudras were given a very low status. They could neither perform sacrifices nor yajnas. They were described as "despised, unholy and impure creatures whose touch caused ceremonial impurity". Ghurye has also said that only the first three orders were recognized in the Vedic age as far as religious and ritualistic life was concerned. The Shudra was systematically debarred from following the religious practices of the Aryans.

This does not mean that the Shudras were treated as untouchables. This is evident from the fact that even a carpenter's touch also caused impurity in the yajna which needed sprinkling of water to purify it. The carpenters were surely not untouchables. The idea of untouchability of the Shudras perhaps developed in the Sutra period. What underlies untouchability is the notion of pollution, defilement and contamination. Referring to the notion of purity, Ghurye has said: Before 800 B.C., we find the idea of ceremonial purity almost fully fledged and been operative in relation to not only the despised and degraded group of people called "Chandalas" but also the fourth order of the society, the Shudras. Ambedkar has, however, maintained that while the impure as a class came into existence at the time of the Dharmasutras, the untouchables came into being much later than 400 A.D. Ambedkar has further said: If anthropology is a science which can be depended upon to determine the race of the people, then the result obtained by the application of anthropometry to the various strata of Hindu society disprove that the untouchables belong to a race different from the Aryans and the Dravidians. The Brahmins and the untouchables belong to the same race. Hutton's opinion is that the origin of the position of the exterior castes is partly racial, partly religious, and partly a matter of social custom.

The economic condition of the Shudras also reveals the low position that they occupied in the hierarchy of society. The cases of Shudras possessing cattle and wealth were very rare. Mostly they worked as landless laborers on farms and as domestic servants. One Sutra mentions "Shudras have to earn their subsistence only by serving the higher varnas".

The Hindu literature emphasizes on salvation through devotion to a deity. The idea of Karma and Dharma were convenient ideologies for keeping lower castes under control. It was argued that they might suffer in this life but by observing the dharma they could get benefit in their next birth. The onus of responsibility was, therefore, on the individual and not on society. The emphasis on individual salvation gave the individual an importance that was absent in real life and therefore served to keep him quiescent and passive. But this explanation of karma is not acceptable to lower caste groups who, while supporting the notion of rebirth, do not accept that they were born low because of misdemeanours in the previous birth.

All this discussion points out to several facts:

1. The Shudras were non Aryans and the term Shudra was not understood in the sense of varna;
2. Their status - religious, social and economic - was low since early times, maybe from first century B.C.,
3. In early periods they were not untouchables
4. The problem of the origin of the Shudras remains a mystery and an unsolved riddle in the social history of India
5. The idea of purity - whether occupational or ceremonial - was the very soul of the idea and practice of untouchability since the Brahmanic period onwards (Second century A.D.)

(1) ✓ The term "Scheduled Caste" was coined by the Simon Commission in 1935 which came to be used for the people described as untouchables. According to Ambedkar, in early India, they were known as "Broken men" or "Out Castes". The British described them as "depressed classes". In 1931 census, they were classified as "exterior castes". Mahatma Gandhi designated these classes as "Harijans" - the children of God. The educated persons among the untouchable castes did not take to this nomenclature kindly as they thought that to single them out as the children of God merely means that attempts were being made to make their conditions tolerable rather than destroy the system that bred inequality. The framers of the Indian Constitution also adopted the term coined by Simon Commission.

The Simon Commission prescribed thirteen tests for including a caste in the Scheduled list. Some of these were:

- Whether caste in question pollutes high castes by their touch or proximity
- Whether caste in question is denied entry into temples
- Whether caste in question is denied the use of public places like schools, wells, etc.
- Whether the caste in question can be served by Brahmins as purohits
- Whether caste in question can be served by tailors, barbers, washermen, etc.
- Whether caste in question is one from whose hands a caste Hindu can take water
- Whether in ordinary social intercourse, a well educated member of the caste in question will be treated as an equal by a high caste man.
- Whether caste in question is merely "depressed" on account of its own ignorance, illiteracy or poverty and but for that would be subject to no social disability.
- Whether caste in question is "depressed" on account of the occupation followed and whether but for that question, it would be subject to no social disability.

The total number of SCs in 1935 was estimated as 227 with a population of 50.1 million. In 1981, their population increased to 104.75 million, which is further increased to 106.23 in 1991. The SCs comprised 15.7 % of the country's total population in 1981 but in 1991, this percentage increased to 16.73. According to the 2001 census, the Schedule Caste population constituted around 16.2% of the total population.

(2) ✓ About 84% of the SCs live in the rural areas as agriculture labor, sharecroppers, tenants, and marginal farmers. Almost all persons engaged in jobs like sweeping, scavenging and tanning belong to the SCs. In terms of occupation, 42.2% fall in the category of workers. Of these, 53.8% are working as leather workers, 12.45% as weavers, 7.9% as fishermen, 6.8% as toddy tappers, 4.6% as washermen, 3.7% as scavengers, 1.3% as artisans, 0.9% as cobblers, and 1.3% in other petty activities.

2019 ✓ About two thirds of the bonded labor is from the SCs. Literacy among the SCs is extremely low. It was only 21.4% in 1981 as against the all India average of 41.3%. Most of them live below the poverty line and are the victims of social and economic exploitation. In theory untouchability might have been abolished but in practice, these people continue to be the subjects of discrimination.

Restrictions were put on the Shudras ever since the time of the Brahmanas, that is, the Later Vedic age. They were not allowed in the hall where a sacrifice was being offered. The vessels used by castes like Khati, Lohar and even Dhobi for cooking meals could be used by others after cleaning them but the vessels used by the Chandalas could not be used by others. Kautilya in the Maurya period regarded the Shudras so low that he suggested avoiding them. In the Muslim period such restrictions were imposed on the untouchables in places like Poona, Madras, Mysore, etc., that they could not enter the cities after the sunset lest their shadows may pollute the upper caste persons. Even in the second quarter of the 20th century during the British period, their entry in temples was forbidden. There were separate drinking water wells for them in the villages. Referring to their entry in temples, Mahatma Gandhi wrote in 1933 that temple entry is one spiritual act that would constitute the message of the freedom to the Untouchables and assure them that they are not outcastes before God. But a year later he wrote that they had no desire that the temple should be opened to Harijans until caste Hindu opinion is ripe for the opening. He said that it is not a question of Harijans asserting their right of temple entry but is the bounded duty of every caste Hindu to secure that opening for Harijans. Referring to ostracizing Harijans because of their occupation of scavenging, Mahatma spoke of hereditary occupation as a natural order but not an ideal practice. He said that as an ideal, it is obviously incompatible with the democratic ethos of modern society. However, he also referred to the limits of occupational mobility. Reacting to this view, Ambedkar caustically commented in 1948: Why appeal to the pride and vanity of human beings in order to accept voluntarily what on a rational basis he would resent as a cruel discrimination against him? What is the use of telling the scavenger that even a Brahmin is prepared to do scavenging, when it is clear that even if a Brahmin did scavenging, he would never be subject to the disabilities of one who is born scavenger.

It is a fact that in India, a man gets a low or a high status more because of his birth than because of his work. Therefore, appealing to the pride and vanity of the scavengers to induce them and to tell them that scavenging is a noble profession and they should not be ashamed of it is indeed a cruel joke on the helpless classes.

Some of the prohibitions against the lower castes were:

- ◆ That they shall not wear ornaments of gold and silver
- ◆ That the males shall not be allowed to wear clothes below their knee or above the hips
- ◆ That they shall not be allowed to have their hair cropped
- ◆ That they shall not use other than earthen ware vessels in their homes
- ◆ That their women shall not be allowed to use flowers or saffron paste
- ◆ That men shall not use umbrellas for protection against the sun and rain, nor shall they wear sandals.

D.N. Majumdar summarized the position of the depressed castes in 1940s by maintaining that these castes are not depressed in all states; the same caste may be depressed in one area but may not suffer from any social and political disability in another. In Madhya Pradesh, the same caste has different social rights and disabilities even in adjacent districts. The disabilities are rigid where the depressed castes are numerically small or on the decline where they are numerically strong. Where the castes are all of the same ethnic stock or are largely so, social disabilities are not numerous and are usually confined to those whose occupation is considered degrading. Where the higher castes are not numerous and the depressed castes form the bulk of population, the degree of ceremonial pollution observed is very small, and often

we find few disabilities attached to the inferior castes. A caste may be depressed but individual members of the caste who have succeeded in life and who are wealthy and own property, have been admitted to a higher social status, and even have wives from the Rajputs or the like.

The fact is that the attitude of the people towards the untouchables has not changed even today. Wherever efforts have been made by the organs of the state and state supported non-official agencies to implement the welfare programs and adopt ameliorative measures, there has been social sabotage side by side by the dark forces of the society. For example, some schools admitting the members of SCs segregate them in separate benches in one corner of the same class. Sometime back, a circular was issued by the head of one government department in a state that on October 2, a common lunch be organized for the SCs and other staff of the department. The lunch was no doubt organized but the upper caste employees told the SC employees that since it was a special occasion, they would like to feed them first and serve them. After the SC employees had their lunch, they were politely told to take rest and the remaining staff will serve themselves. In another state, the SCs and the caste Hindu students were living in the same hostel but they were segregated in different rooms.

It is because of such attitudes that it is said that unless given special attention for a certain period and raised to what may be called the normal level of socio economic development, they will not be able to take advantage of the general facilities available to the nation. Gandhi was also of the opinion that unless and until we treat the Harijan as our own brother, we cannot treat humanity as one brotherhood. The whole movement for the removal of untouchability is a movement for the establishment of universal brotherhood and nothing less.

There are about 1000 Hindu lower castes registered in India. Many of their names are synonymous. Some of the castes number several million members each. Since the 1950's a tendency was observed of a decrease in the ratio of the scheduled castes in the population as a whole. However, by beginning of the eighties the situation changed. This was reflected in the census figures of the population. In 1951 the scheduled castes constituted 15.3%, in 1961 - 14.7%, in 1971 - 14.6%, and in 1981 - 15.8% of the population.

More than 85% of the scheduled caste households owning land possess the tiniest or small plots of land. Many from among the scheduled castes continue to work in their traditional caste occupation. According to the data collected by Indian scholars 40 million people belonged to such castes. Of these almost 20.5 million were leather workers, 4.7 million weavers, 3 million fisher folk, 2.5 million were engaged in collecting palm sap or in pig-breeding, 2 million were basket weavers, 1.7 million were launderers, dyers and printers. In a number of regions the majority of those employed in the above mentioned trades were exclusively from the scheduled castes. Besides, 1.4 million persons continued their ancestral caste occupation connected with the cleaning of streets, yards and toilets.

According to data provided by the Indian Council of Social Science Research (ICSSR), in 34 out of 40 villages in Gujarat where a survey was conducted, rules of untouchability were observed as between scheduled castes. It is important to note that under any conditions the caste dominating in a given region (the largest and strongest "clean", but definitely a higher caste on the social and economic level) strictly sees to it that the caste hierarchy is not disturbed. Thus, in order to raise its status an untouchable caste must raise itself at least a little "higher" than another untouchable (for the "clean" Hindus) caste. This is one of the reasons for the fact that at the bottom of the caste hierarchy we observe a subtle caste differentiation, and following from this, caste discrimination, competition and rivalry between castes aiming at rising a little higher than others or holding on to their older positions but not wanting to be the lowliest of the low.

⑥ The practice of untouchability persists in one form or another in a number of regions of the country, which is explained by the fact that it is precisely the scheduled castes that represent the poorest sections of the population. This is confirmed by the 1985 report of the L.N. Mishra, Institute of Economic Growth, regarding the work of the Bihar Corporation for the Development of the Scheduled Castes. The report says that more than 95% of the Harijans in Bihar State live below the poverty line. The majority of them

remain untouchables as before and suffer from traditional restrictions. The reports of the Commissioner for Scheduled Castes have repeatedly emphasised that it has still not been possible to overcome the segregation of the scheduled castes that are forced to live separately from the caste Hindus.

It is not only in Bihar that social discrimination against the scheduled castes persists in some form or the other. A similar situation prevails even in those states where Harijans had been actively involved in the struggle for improving their conditions during the national freedom movement and where they have registered notable successes in achieving equal rights in the years since Independence. Social discrimination on a caste basis still leads to inter-caste clashes. The Harijan discontent sometimes flows into the traditional channels, when their demonstration occurs under the slogans of struggle against upper caste violence.

On another occasion the press wrote a great deal about the efforts of a small group of Harijans who were trying to enter a Hindu temple situated near Trivandrum, the capital city of Kerala State. The Harijans marched 300 kilometres to mobilise public opinion in their favour. The Brahmin priests finally allowed them into the temple, but the Harijans had to give a written assurance that they were "genuine followers of Hinduism".

(B) In 1966, the Government appointed a commission under the Chairmanship of N.R. Malkani, Vice-President of the Harijan Sevak Sangh, to report on the condition of this caste. In its report to the Central Government "On Customary Right to Scavenging" the Malkani Commission noted that this type of work was still widely prevalent and was executed only by certain castes. The work of the sweepers and scavengers is mainly done on the basis of a private contract which has no fixed terms and is done on a hereditary basis in a number of regions of the country. In the Commission's view, the hereditary right to the occupation of Bhangis is in essence "the continuation of the traditional village system of Jajmani". The hereditary rights of the Bhangis provided for their traditional territorial division to serve the houses of high caste Hindus. The Commission, in 1978-79 demanded again that "a stage by stage program everywhere in the country for ending the inhuman practice of collection of night soil be worked out" so that by the middle of the eighties this evil practice could be done away with.

In its report for 1982 the Special Cell for the Protection of Civil Rights under the Ministry of Home Affairs, which oversees the realisation of Government decisions relating to the scheduled castes noted that the communities engaged in scavenging are ranked at the bottom of our social hierarchy. Thus, this problem and its solution have a very high relevance to the untouchability situation and the objectives of the protection of Civil Rights Act.

The condition of Harijan women merits special attention. In first place they do heavy physical work like their men, and unlike caste Hindu women. Especially degrading is the position of women from families of agricultural workers who have fallen into bondage. In 1981, they numbered more than two million. The money lender is, as a rule, also the owner of the land on which such a family works. Not infrequently he is the arbiter not only of the labour of his debtor, but master also of the body of his wife and daughters.

(C) Sexual exploitation of the scheduled caste women takes other forms too. The traditional institution of devadasis, which was banned by the State Governments of Karnataka, Maharashtra and Tamil Nadu after India attained Independence, still continues, and as the Report of the Committee on the condition of women in India says, it is still found in the states of Andhra Pradesh, Orissa and Tamil Nadu. Moreover in certain parts of the country, like in Uttar Pradesh, where the devadasi institution did not exist before, women were serving in temples and maintaining their families by prostitution. Women from the scheduled castes have begun to work quite frequently as domestic servants in high caste Hindu homes in recent years. The scheduled castes, more than the others, are forced to use the labour of their children to supplement the family income. In recent years the exploitation of child labour has grown in India. A large number of children are engaged in the service spheres of motor vehicles servicing, eating establishments, shops, markets and so on, but they are especially numerous in agriculture.

On the whole, the socio-economic problems faced by the Harijans are more numerous and of greater intensity than those faced by the rest of the population. This is vividly shown by the effect that there is

2/3rds of bonded Labourers are SCs

Anthropology Paper 02 - Volume 03

(Q) noticeably higher indebtedness among them than among other sections of the population which in turn leads them into debt bondage. According to data provided by the Mahatma Gandhi Peace Foundation and the National Institute of Labour (1971), which studied 1,000 villages in 295 districts of 10 Indian states, of the 2.2 million bonded labourers discovered there, 66% were from the scheduled castes and 16.3% from the scheduled tribes. More than half the debts were incurred to meet the essential needs of everyday necessities, mainly food, and one third was incurred to meet expenses in connection with marriages and funerals. It is noteworthy that 85% of the creditors belonged to high caste Hindus.

The adoption of laws meant to protect the rights of the scheduled castes, the realisation of socio-economic measures in their interests and the atmosphere of support to the lawful demands of the Harijans that was created as the result of the work done by the government bodies, democratic organisations and the progressive press are leading to a further enhancement of both the economic and political life of the scheduled castes.

In the Five-year Plans of the country it was underlined that the main task of the all embracing struggle with poverty and the mobilisation of latent energy for creating a more dynamic and egalitarian society will be achieved only on the condition that the scheduled castes and tribes are directly benefited. It is felt that the scheduled castes "cannot and in the future will not be able to automatically get the share assigned to them in the programs of development because of reasons which are quite obvious to those who are aware of the Indian social structure and stratification, who know the social system and the progresses that are occurring, unless special stress is laid on their all-round development and the means and facilities assigned to them by the Plans are consciously made available to them.

At present cases of social discrimination in public transport, in organs of local self-government, schools and post offices i.e., where this is not connected with the traditional village community relations are quite rare.

The Economic and Political Weekly emphasised that the difficult material condition of the Harijans was due not so much to their religious status as to their economic dependence on the Kulas. The Harijans going over to Islam was a result of the clash between the dominating middle class which constituted the chief social base of the rich and middle peasantry, on the one hand, and the scheduled castes exploited by them, who labour on their fields as agricultural workers, on the other.

The new approach to the problem of Harijans at the Central level did not, however, lead to any notable steps forward. On an average less than 1% of the budget allocations were set apart for development of the Scheduled Castes from 1951 to 1980, in spite of the fact that they constituted 22% of the country's population. But even these modest funds were not fully utilised. Altogether an amount of 3,400 million rupees was spent in 30 years for the development of the Scheduled Castes, or a little more than one rupee per capita. Up to 1974 less than 0.5% of the budget expenditure fell to the share of the Scheduled Castes, who constituted 14.7% of the population - 13 paise per person annually.

The 20 point program was introduced when an emergency had been proclaimed in the country and in the absence of the necessary infrastructure. (Persons emancipated from bonded labour were frequently left without any means of subsistence). All the same, the 20-point program yielded some results. About 430,000 Harijan families became owners of plots of land up to an acre. By 1979 the Scheduled castes had received 13.3% of the lands taken away by the Government as surplus under the Land Ceiling Act.

The Bonded Labour Abolition Act (1976) provided for punishment up to three years imprisonment and a fine up to Rs.3,000/- to anyone trying to hinder the emancipation of workers held in bondage by him. Another no less important step was the Protection of Civil Rights Act, which was a continuation and expansion of the former Untouchability Offences Act, 1955.

The Centre's help for the development of the scheduled castes in 1980-81 amounting to a thousand million rupees was provided for realising, through a component plan, accelerated development of these castes. The objective was set to raise 50% of the Harijans "above the poverty line".

In January, 1982 a new 20-point program was adopted within the frame work of the Sixth Five Year Plan. The program spoke of completing the agrarian reforms, putting the Minimum Wage Law for agricultural workers into effect; providing drinking water to all the villages, allotment of plots for building housing, improving the living conditions of the slum-dwellers, emancipating bonded labour, and so on. The program reaffirmed the directive principles of the Constitution of India regarding the responsibility of the state for ensuring the economic and cultural development of the scheduled castes and protecting them from injustice and all forms of exploitation.

The nature of the participation of the scheduled castes in social life has undergone a change as a result of the realisation of democratic transformations during the years since the attainment of Indian Independence and as a consequence of the special measures taken to improve their condition. From a passive object of socio-economic and political exploitation they are gradually becoming an active subject of political struggle.

Although the awakening of the lower castes is taking place basically within the caste framework, these traditional barriers are gradually breaking down in the course of class battles and the unification of the poor in agricultural workers' unions. And the demands to review the working relationships in the agrarian sector on an economic basis, to strictly observe the minimum wages law, carry out land reforms, and so on, demands that are put forth by agricultural workers, primarily those belonging to the lower castes especially in the South of the country, are essentially class demands. These demands are basically different from the narrow caste demands of the earlier movements of the untouchables.

Constitutional Safeguards for Scheduled Castes and Scheduled Tribes

Earlier Policies towards Tribes: Fifteenth of August 1947 heralded a rosy dawn over India. It stirred fresh hopes and brought new promises to all people including the tribes. Indeed, those who took over the reigns of power from the hands of the alien rulers and undertook to shape the destiny of India displayed a lot of concern for the fate and future of the tribal people. Therefore, when they sat down to frame the Constitution of India they wanted to know the exact policies towards tribes and the actual levels of development of tribes, and then a policy that was best suited to all tribes in India.

The Constitution makers reviewed the existing policies towards tribes and the socio-economic levels of the tribes and came to the following conclusions:

1. The then existing policy of segregation could not be appreciated as it was thought that the keeping of the tribes into Excluded and Partially excluded areas has always led them to stagnation from the point of view of progress.
2. What exactly was a tribe could not be known because the alien rulers left no information regarding which groups actually comprise the tribes of India. Under the circumstances, no distinction could be made between the tribes and non-tribes.
3. The policy of assimilation could not be accepted, for it would destroy the tribal cultures of India.

The makers of the Constitution of India were however conscious of the fact that due to historical reasons, including the policy of segregation followed by the British rulers, certain amount of mental barriers had come into existence between the tribal and non-tribal populations in several parts of India. It required a deft and phased approach to remove these barriers. They also recognized that unless the social, economic, cultural and political conditions of life of the tribes were improved so as to bring them at par with the rest of the nation, the tribes would remain weak-links in the social and cultural frame of free India.

Designing the new Policy towards Scheduled Castes and Tribes: Although the Constitution makers recognized that the SCs and STs should be improved at par with the rest of the nation, they were puzzled over the question as to how to bring the tribal people at par with the rest of the Indians. They decided

✓ that these people should be integrated with the main stream Indian society without damaging their distinctive socio-cultural entity. Therefore they designed the policy of development and integration.

When India's Constitution was framed in 1950, the Constitution makers took great care to liberally include articles and schedules purporting to provide the design of the policy of development and integration with respect to the SCs and STs of India. The articles and schedules of the Constitution clearly highlighted that the tribes should be developed because there is a wide socio-cultural and technoeconomic gulf between the tribal groups and the rest of the Indians and that the SCs and STs at the same time should be integrated with the rest of the Indians socially, economically, culturally and politically without destroying what is distinctly good in their society, economy, culture and polity.

For the purpose of identifying the STs and SCs, the makers of Constitution avoided the problem of defining them in India by pragmatic expedience of laying down to the Constitution that the STs and SCs are what the President of India by notification lists and places under a schedule, hence they must be known as Scheduled Tribes / Scheduled Castes and that the President of India may issue a subsequent notification modifying the list of Scheduled Tribes after it was approved by Indian Parliament by law. Thus a ST / SC is what the President of India initially by notification specifies and includes in the list of Scheduled Tribes / Scheduled Castes and thereafter what the Parliament of India by law includes or excludes from the said list.

The makers of Constitution also delineated the salient features of the policy of development and integration towards SCs and STs in the form of the broad features of the Directive Principle of State Policy. The salient features of the policy are...

1. Special responsibility of the State to bring all round advancement of the tribes;
2. Promotion of the educational and economic interests and protection from injustice and all forms of exploitation;
3. Reservation in services;
4. Reservation of seats in Parliament and State Legislatures;
5. Appointment of a Special Officer to investigate all matters relating to the safeguards provided for the tribes, and
6. Specification of the areas where the tribes are chiefly concentrated as Scheduled Areas and Tribal Areas.

Every state in the Indian Union was even assured of finances to meet the costs of such schemes of development as may be undertaken for the purposes of promoting the welfare of the Scheduled Tribes and Scheduled Castes in that state or raising the level of administration of the Scheduled Areas therein to that of the administration of the rest of the areas of that state. In accordance with the salient features of the policy, several safeguards, reservations and protections were woven into the text of Indian Constitution. Some of them were originally for ten years. The makers of the Constitution stipulated this ten-year period, assuming, in a burst of optimism, that thereafter they would be no longer necessary. All that would be needed for them will be a few effective follow up programs. However, as a matter of caution, it was included in the salient features of the policy that at the expiration of the ten-year period, the President shall appoint a Commission to report on the progress made in the administration of the Scheduled Areas and the welfare of the Scheduled Tribes in the states.

In 1960, a decade after the promulgation of the Constitution, the President appointed a Scheduled Areas and Scheduled Tribes Commission under the Chairmanship of U.N. Dhebar. This Commission, after making a survey of the development of the tribes and integration of the tribes with the rest of the Indian society, recommended extension of the continuance of the special safeguards until 26th January, 1970. Second extension of the continuance of the special safeguards is given up to 25th January, 1980. Third extension of the continuance is given up to 26th January, 1990 and is continuing till date.

(3) Development Provisions - (6, 1, 6) 115, 122

(4) Reservation provisions - 230, 332, 334, 343 (D), 115, 122

CONSTITUTIONAL SAFEGUARDS

Types of Safeguards: The various special provisions made in the Constitution of India with regard to the tribal population are known as the Constitutional Safeguards. These safeguards may be classified into three broad types: protective safeguards, political safeguards and developmental safeguards.

The **protective safeguards** are meant for protecting the tribal populations with regard to education, employment, economy, social injustice, forced labor and administration of specified areas.

(1) The **political safeguards** are concerned with reservation of seats for tribes in Parliament and State Legislatures, appointment of a Minister in-charge of Tribal Welfare in certain states where the tribes are in considerable numbers and special provisions in respect of Nagaland, Assam and Manipur.

(2) The **developmental safeguards** are meant for promoting the educational and economic interests of the tribal peoples, for providing free legal aid to the tribal peoples and for giving grants from Central Government to the States for welfare of the tribal peoples and raising the level of administration of Scheduled Areas.

All these safeguards for promoting and safeguarding the interests of the persons belonging to the tribes are written into the Constitution by means of specific Articles.

(1) **Protective Safeguards:** 15(4), 16(4), 320, 335, 19(5), 23, 25, 29, 46, 338(A), 325

I. Articles 15, 15(4) and 29 are concerned with educational safeguards:

Article 15 is under the Chapter on Fundamental Rights. It assures all citizens of India that no discrimination will be permitted on grounds of religion, race, caste, sex or place of birth. It specifies that no citizen shall, on these grounds or any of them, be subject to any disability, liability, restriction or condition with regard to:

- Access to shops, public restaurants, hotels and places of public entertainment; or
- The use of wells, tanks, bathing ghats, roads and places of public resort maintained wholly or partly out of State funds dedicated to the use of the general public.

This Article acquires significance because the tribal people have been in the past discriminated against on grounds of religion, race and place of birth.

Article 15, Clause (4) empowers the State to make any special provision for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes and the Scheduled Tribes.

Article 29 states that any section of the citizens in the territory of India, or any part thereof, having a distinct language, script or culture of its own shall have the right to conserve the same. It protects the cultural and educational rights of the minorities. This provision also acquires special significance when applied to the tribal people who constitute one of the important cultural minorities of India.

II. Articles 16, 16(4), 320(4) and 335 are concerned with safeguards for employment:

Article 16 provides for equality of opportunities for all citizens in matters relating to employment or appointment to any office under the State. It further provides that no citizen shall, on grounds only of religion, race, caste, sex, descent, place of birth, residence or any of their, be eligible for, or discriminated against, in respect of any employment or office under the State. This article assures equality of opportunity to all citizens including the tribes in matters of employment with government.

Article 16 Clause (4) lays down that the State shall have the power to make any provision for the reservation of appointments of posts in favour of any backward class citizens which, in the opinion of the State, is not adequately represented in the service under the State. The Scheduled Castes and the

Scheduled Tribes constitute the most important categories of backward classes of citizens for the purpose of these safeguards.

Article 320 Clause 4 lays down, inter alia, that consultation with the Union Public Service Commission or the State Public Service Commission is not necessary as regards the manner of giving effect to service safeguards for the Scheduled Castes and the Scheduled Tribes.

Article 335 states that the claims of the members of the Scheduled Castes and Scheduled Tribes shall be taken into consideration, consistently with the maintenance of efficiency of administration in the making of appointments to services and posts in connection with the affairs of the Union or of a State. It assures that the Scheduled Castes and Tribes will be given special attention, while filling in posts in the service.

325, 338A

III. Articles 17 and 25 are concerned with the social safeguards:

Article 17 relates to abolition of untouchability and its practice in any form. It emphasized that enforcement of any disability arising out of untouchability is an offense punishable in accordance with law.

Article 25 relates to freedom of conscience, and practice and propagation of religion. However, it says, the State has the power to enforce any existing law or make any law providing for social welfare and reform or the throwing open ion of religion. However, it says, the State has the power to enforce any existing law or make any law providing for of Hindu religious institutions of a public character to all classes and sections of Hindus. Thus this Article gives the right of freedom of religion to all including the tribal people of India.

IV. Article 19 is concerned with the economic safeguards:

Article 19 protects certain rights of all citizens of the country. Clause (1) of this Article grants freedom of speech, expression, residence, acquisition and disposal of property, practice of profession, free association and free movement. Clause (5) of this Article, however, states that these rights shall not effect the operation of any existing law in so far as it imposes, or prevents the State from making any law conferred by the Clause (1), either in the interests of the general public or for the protection of the interests of any Scheduled Tribe. This provision prevents the lands of a tribal from passing into the hands of a non-tribal in the Scheduled Areas and also exercises control over operation of money-lenders in those Areas.

V. Article 23 is concerned with the abolition of forced labor:

Article 23 prohibits traffic in human beings and forced labor and any contravention of this provision is an offence punishable in accordance with law. However, the State has the power to impose compulsory service for public purposes and in imposing such service the State shall not make any discrimination on grounds only of religion, race, caste or class or any of them. Thus this Article illegalizes traffic in human beings and forced labor, evils that non-tribal people have encouraged and imposed upon the tribal peoples.

VI. Article 46 is concerned with the protection from social injustice and all forms of exploitation:

Article 46 lays down that the State shall promote with special care the educational and economic interest of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and shall protect them from social injustice and all forms of exploitation.

VII. Articles 244 and 339 are concerned with the administration of Scheduled and Tribal Areas:

(a) Article 244 states that the provisions of the Fifth Schedule shall apply to the administration and control of the Scheduled Areas and Scheduled Tribes in any State other than Assam, while the provisions of the Sixth Schedule shall apply to the administration of the Tribal Areas in the State of Assam. The Governor of each State having Scheduled Areas is required to submit to the President an Annual Report regarding the

(b) Art 244A - 7 schedule 164 - Special Tribal Minister for 4 states

administration of the Scheduled Areas in that State. Each such State has a Tribes Advisory Council. If the President so directs, a state having Scheduled Tribes but not Scheduled Areas therein, may also have a Tribes Advisory Council. The Governor may by public notification direct that any particular Act of Parliament or of the State Legislature shall not apply to a Scheduled Area or any part thereof in the State subject to such exceptions and modifications as he may specify in the notification and any such direction can be given with retrospective effect. The Governor may make regulations for the peace and good government of a Scheduled Area. Such regulations may particularly;

1. Prohibit or restrict the transfer of land by or among members of the Scheduled Tribes in such area.
2. Regulate the allotment of land to the members of the Scheduled Tribes in such area,
3. Regulate the carrying on of business as moneylender by persons who lend money to members of the Scheduled Tribes in such area.

In making such regulations, the Governor may repeal or amend any Act of Parliament or of the State Legislature or any existing law which is for the time being applicable to the area in question. All such regulations have to receive the President's assent before they can become effective. The Tribes Advisory Council has to be consulted before such a regulation is made by the Governor.

Relevance of the Fifth and Sixth Schedules of the Constitution and their Implementation:

Article 342 of the Indian Constitution reads:

1. The President may with respect to any state or Union Territory, and where it is a state, after consultation with the Governor thereof, by public notification, specify the tribes or tribal communities or parts of or groups within tribes or tribal communities which shall for the purpose of this Constitution be deemed to be Scheduled Tribes in relation to that state or Union Territory, as the case may be.
2. Parliament may, by law include or exclude from the list of Scheduled Tribes specified in a notification issued under the said clause shall not be varied by any subsequent notification.

Under Article 342, the President may by public notification specify, the tribes or tribal communities or parts of or groups within tribes or tribal communities which shall be deemed to be Scheduled Tribes for purpose of the Constitution. In exercise of the said powers, the President issued the Constitution (Scheduled Tribes) Order, 1950 which has been amended from time to time. By virtue of clause (2) Parliament passed in 1976, the Scheduled Castes and Scheduled Tribes Orders (Amendment) Act, 1976.

Article 244 of the Constitution concerns itself with the administration of Scheduled Areas and Tribal Areas. This article reads:

1. The provisions of the Fifth Schedule shall apply to the administration and control of the Scheduled Areas and Scheduled Tribes in any state other than the states of Assam, Meghalaya, Tripura and Mizoram.
2. The provisions of the Sixth Schedule shall apply to the administration of tribal areas in the states of Assam, Meghalaya, Tripura and Mizoram.

Scheduled Tribes means such tribes or tribal communities or parts of or groups within such tribes or tribal communities as are illustrated in the Scheduled Tribes Order under Article 342. Scheduled Areas mean such areas as the President may by order declare to be Scheduled Areas.

The Fifth and Sixth Schedules of the Constitution of India should be read with the Article 244 (1) and 244 (2) respectively.

Bhorehal Committee } recommend for Governor's independence in Schedule Areas
 2nd ARC

Anthropology Paper 02 - Volume 03

THE FIFTH SCHEDULE

Intro The Fifth Schedule of the Constitution is concerned with the administration and control of Scheduled Areas and Schedule Tribes in states other than Assam, Meghalaya, Tripura and Mizoram. According to the provisions therein, the Governor of each state having Scheduled Areas shall annually, or whenever so required by the President, make a report to the President regarding the administration of the Scheduled Areas in that state and the executive power of the Union shall extend to the giving of directions to the state as to the administration of the said areas.

Union

This provision in the Fifth Schedule thus ensures a direct control of the Union and President over the administration of the Tribal areas. Owing to the problems the tribal areas are facing with, their relative isolation for long periods of time might have convinced the framers of our Constitution to have a direct control over these areas to ensure unhindered development, welfare and protection. The Governor is made responsible to the President, regarding all matters pertaining to the administration of the Scheduled Areas and Tribes.

3 According to this Schedule, Tribes Advisory Council shall be established in those states having Scheduled Tribes, consisting of not more than 20 members of whom, as nearly as may be, three fourths shall be the representatives of the Scheduled Tribes in the Legislative Assembly of the State.

TAC

4 It is the duty of the Tribes Advisory Council to advise on such matters pertaining to the welfare and advancement of the Scheduled Tribes in the State as may be referred to them by the Governor. The Governor is entrusted with the power of making rules and prescribing regulations regarding the number of members of the Council, the conduct of its meetings and procedure in general.

TACs are generally chaired by Chief Ministers.

Thus the Fifth Schedule provides an effective mechanism to accommodate the tribal interests and points of view regarding the direction they choose for development and also for redressing their grievances. This provides for bridging a gulf between the government and the tribes with reference to communication, especially in the context of tribal planning and development programs. This ensures an effective mechanism to accommodate the age-old adage of bottom top approach in planning which would ensure success in the majority of the development measures.

5 The Fifth schedule also entrusts the Governor with a power to direct that any Act made by the parliament or Legislature of the state not to apply to a Schedule Area or any part thereof in the state. This entrusts with the Governor a power to make regulations for the peace and good government of any area in a state which is a Scheduled area. Thus, the Fifth schedule ensures a greater element of flexibility when the laws are implemented in the Tribal areas owing to their level of development, relative isolation and socio cultural background.

6 a The Fifth Schedule also entrusts with the Governor the power to regulate the Transfer of tribal land, thus reducing to a considerable extent the age-old problem of land alienation among the tribal communities.
 b Moreover, the Governor is also entrusted with a power to regulate the allotment of land, the carrying of business of the moneylenders etc.

The Fifth Schedule has specifically mentioned more a flexible procedure for amending this Schedule so as not to deem any change in these provisions as a part of the Amendment for the purposes of Article 368.

Conclusion Thus, the Fifth Schedule of the Constitution provides a better mechanism to administer the tribal people. It gives an element of flexibility, a sense of greater responsibility and attaching importance to tribal administration and development.

THE SIXTH SCHEDULE

The Sixth Schedule of the Constitution relates to the provisions as to the administration of Tribal areas in the states of Assam, Meghalaya, Tripura and Mizoram.

1 Like the Fifth Schedule, even the Sixth Schedule of the Constitution provides for a mechanism of decentralized power and administrative structures for effective administration of the tribal areas. It provides for Autonomous District Councils and Autonomous Regional Councils constituted by the regulations of the Governor. The Governor has been entrusted with the power to regulate the composition, delimitation of territorial constituencies and other matters relating to the elections and conduct of business of these councils.

The Sixth Schedule gives the power to the District and Regional councils to make laws pertaining to...

- Decentralisation of legislative powers.
1. The allotment, occupation or use, or the setting apart of land other than any land which is a reserved forest for the purposes of agriculture or grazing or for residential or other non-agricultural purposes or for any other purpose likely to promote the interests of the inhabitants of any village or town;
 2. The management of forest not being a reserved forest;
 3. The use of any canal or water course for the purpose of agriculture;
 4. The regulation of the practice of jhum or any other forms of shifting cultivation;
 5. The establishment of village or town committees or councils and their powers;
 6. Any other matter relating to village or town administration, including village or town police and public health and sanitation;
 7. The appointment or succession of chiefs or Headmen;
 8. Inheritance of property;
 9. Marriage and divorce; and
 10. Social customs

Autonomous Councils of North Cachar & Karbi Anglong
are granted additional powers to make laws w.r.t. matters like secondary education, agriculture, social security, social insurance, public health & sanitation, minor irrigation.

Thus, the Constitution has realized the importance of acknowledging the socio-economic and cultural background of these very isolated and primitive tribes of the North East and has hence provided for an element of flexibility and decentralization regarding any laws applicable to and effecting their social institutions.

Judicial 3 (pg 230)
① Apart from the decentralization of the legislative powers, the Constitution, through the provisions of the Sixth Schedule, has also ensured a decentralization of judicial processes giving these powers to the District and Regional Councils the power of courts for the trial of suits and cases between the parties, all of whom belong to the Scheduled Tribes within such areas. This provision thus respects the importance of accommodating the traditional tribal justice to ensure its continuance effectively. Moreover, the Governor has the power to confer the powers through the Civil and Criminal Procedure Codes to these councils.

Financial 4
④ In the areas of financial administration, the Councils have been entrusted with the power to collect taxes, licensing fee and royalties with respect to the extraction of the minerals and other industrial activities in the areas of their jurisdiction. This ensures a more effective mechanism to protect the tribal interests in their ecosystems and their traditional relationships established through culture to the nature surrounding them. This gives them a greater element of autonomy and a sense of pride in owning their traditional rights of land.

Thus the Sixth Schedule has given a greater impetus to the field of tribal administration in this country to identify, respect and accommodate the tribal social, cultural and economic backgrounds.

In summary, the Fifth and Sixth Schedules of the Constitution have given more legitimacy to the anthropologists' policy of isolation by giving them an opportunity to develop in their own direction. They

Others 5 District Councils have powers to establish primary schools, dispensaries, markets etc.

also ensure a greater control of the Centre over the States' policy towards tribal development. They indirectly help in slowly bringing the tribes to the mainstream of the country.

The Implementation: Articles 244 and 244(A) under part X of the Constitution provide for Administration of Scheduled Areas and Tribal Areas. Under the Constitution, the terms Scheduled Areas and Tribal Areas have definite connotations. The Scheduled Areas are governed by the provisions contained in the Fifth Schedule. These may also be called the Fifth Scheduled Areas. The Tribal Areas are governed by the provisions of the Sixth Schedule.

SCHEDULED AREAS + pg 296 (Criteria to declare Schedule Area)

As per para 6 of the Part "C" of the Fifth Schedule of the Constitution, the expression 'Scheduled Areas' means such areas as the President may, by order, declare to be Scheduled Areas. The President may make any changes in the Scheduled Areas after consultation with the Governor of a State. The Parliament has been empowered to make any amendment in the Schedule. However, any such law making amendment in the Schedule of the Scheduled Areas shall not be deemed to be an amendment of the Constitution for the purpose of Article 368.

GOI-1870 Act started area wise isolation by identifying 'scheduled tracts'
Ex:- Assam, keonjhar, Garhwal.

Historical Background: The history of the Scheduled Areas may be traced back to "The Scheduled District Act, 1874" which provided for the appointment of special officers to administer civil and criminal justice, to superintend the settlement and collection of public revenue and matters relating to rent and otherwise to conduct the administration within the Scheduled Districts. It also provided for the extension, by notification, in Scheduled Districts, of laws enforced in any part of British India with such special restrictions and modifications as were deemed fit. These wide powers of legislation by simple executive order were executed by the Executive. Under the Government of India Act, 1919, the Tribal Areas covered under the Scheduled District Act were removed from the purview of legislature. These areas were divided into two categories, namely, i) wholly Excluded Areas and ii) Areas of Modified Exclusion. But the limit of exclusion differed in extent and degree. Under the Government of India Act, 1935, these areas were declared as "Excluded Areas" and "Partially Excluded Areas". Section 91 of the Act made specific provisions in respect of these areas.

The Government of India Act, 1935 provided that no act of Federal Legislature or the Provincial Legislature would apply to these areas except on the direction of the Governor who was empowered to make such exceptions and modifications as he considered necessary. It also enabled the Governor to make regulations for the peace and good Government of the Areas. However, all such regulations required the assent of the Governor-General. Reservation of seats for tribal areas was also made in the local legislatures of Madras, Bombay, Bihar, Central Provinces, Assam and Orissa.

3(b) 1939 Viceroy Elwin sought to establish a national park for tribes to reduce contact with non-tribals. The Constituent Assembly paid special attention to the tribal situation and appointed two Sub-Committees, one on the North East Frontier (Assam) Tribal and Excluded Areas, and the other on Excluded and Partially Excluded Areas (other than Assam) to go into the details of the problems of the tribal people and the tribal areas. The Sub-Committee on the Excluded and Partially Excluded Areas (other than Assam), while analyzing the tribal situation, observed that it is necessary to provide that laws of the Provincial Legislatures which are likely to be passed on the needs of the majority of the population should not apply automatically, in certain areas if not generally, at least on certain specified subjects. It was further observed that implementation of the suggestion would involve notification of the areas and recommended that these areas should be known as "Scheduled Areas". Dr. B.R. Ambedkar, Chairman, Constitution Drafting Committee, observed that the "Scheduled Areas" was another name for the Excluded and Partially Excluded Areas.

The Sub-Committee also expressed that "in respect of certain subjects, laws passed by the Provincial Legislatures should not be applied to the Scheduled Areas if the Tribes Advisory Council does not consider them suitable for those areas". Thus it provided for a mechanism for scrutiny of legislations with respect to Scheduled Areas. The Fifth Schedule empowers the Governor to decide as to which matters are to be referred to the Tribes Advisory Council for its advice. This has substantially weakened the role of the Tribal Council.

No less than 50% of STs live outside Scheduled Areas & hence denied rights provided in Art 244.
Dilip Singh Bhuria Committee, NAC has recommended inclusion of left out areas under 5th schedule

Objectives: The Scheduled Areas have been constituted with the following two clear objectives:

1. To assist the tribes in enjoying their existing rights without any hindrance by others through summary process.
2. To develop the Scheduled Areas and protect and promote the interests of the Scheduled Tribes.

Administration of the Scheduled Areas: Since the Independence, the President has issued two orders i.e., i) The Scheduled Areas (Part-A States) Order, 1950, and ii) The Scheduled Areas (Part-B States) Order 1950, (as amended). These orders declared certain tribal areas as Scheduled Areas in the states of Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa, Rajasthan and Himachal Pradesh. Jharkhand Chhattisgarh.

The main features of the Fifth Schedule are:

1. Special Legislative Powers of the Governor.
2. Governor's Report to the President.
3. Tribes Advisory Council.

1. SPECIAL LEGISLATIVE POWERS OF THE GOVERNOR:

The Governor of a State having Scheduled Areas has been vested with special powers of legislation in two ways:

- a) Legislation by notification
- b) Legislation by regulation

Legislation by Notification: The Governor of a State having Scheduled Areas is responsible for deciding whether an Act of Parliament or of the State Legislature is suitable or unsuitable for Scheduled Areas. Under clause 5 of the Fifth Schedule, the Governor may, by public notification, direct that any Act of Parliament or of the State Legislature shall not apply to a Scheduled Area or any part thereof in the State or apply thereto subject to such exceptions and modifications as he may specify in the notification. He may withhold or modify the application of the law which is not suitable for such areas. Any Legislation becomes applicable automatically unless specifically restricted in whole or part by a notification by the Governor. In certain cases, an Act of Parliament or State Legislature could adversely affect the tribal interest. In order to rectify such an act of omission or commission, the Governor has been empowered to give retrospective effect to a notification. The notification can be issued by the Governor without any reference either to the Tribes Advisory Council or to the President.

Legislation by Regulation: The Governor has been empowered to make regulation for peace and good government of Scheduled Areas. Such regulations may in particular...

1. Prohibit or restrict the transfer of Scheduled Area land by or among members of the Scheduled Tribes,
2. Regulate the allotment of Scheduled Area land to members of the Scheduled Tribes,
3. Regulate the carrying on of business of money-lenders by persons who lend money to members of the Scheduled Tribes in such Scheduled Areas.

The regulation making power of the Governor for peace and good government of the Scheduled Areas is comprehensive but specific mention of the above three situations shows the concern of the framers of the Constitution to protect the interests of the tribes in land and against exploitation by money-lenders.

The regulation making power of the Governor is subject to the following two limitations mentioned in sub paras 4 and 5 of para 5 of the Fifth Schedule:

1. Such regulation should be made on the previous consultation of the Advisory Council.
2. Regulations should be submitted to the President and shall not have effect until given an assent by him.

The Governor is the Executive Head of a State. He is bound by the advice of the Council of Ministers which has been provided under Article 163 for his advice. Either in this article or in any other provision of the Constitution there is no mention of Governor's discretion for exercising powers granted to him under the Fifth Schedule of the Constitution. There is also no provision of any initiative for the Governor for exercise of his powers mentioned in the Schedule. Even for scrutiny of the legislations enacted by the Parliament or by the State Legislatures, the Governor has to depend on his Council of Ministers and the concerned administrative departments.

2. GOVERNOR'S REPORT TO THE PRESIDENT:

The Union Government has been made responsible for providing guidance for the administration of the Scheduled Areas; Para.3 of the Fifth Schedule lays down mechanism of keeping the Union Government informed of the situation in tribal areas. It provides that the Governor of each State having Scheduled Areas therein shall annually, or whenever so required by the President, make a report to the President regarding the administration of the Scheduled Areas in that State. The submission of the Report by the Governor is intended to enable the Union Government to decide how best it can discharge its responsibility towards the tribes. On its basis the Union Government may issue directives to the State for better administration of the Scheduled Areas.

- ✓ These reports are generally not submitted in time. Various Committees and Commissions and Working Groups which went into the problems of Scheduled Tribes, particularly the Scheduled Areas and Scheduled Tribes Commission (Dhebar Commission, 1961) and the Shilu Ao Study Team (1969) and the Working Group on Development of Scheduled Tribes during the 7th Plan (1984) have observed that the Departmental Reports are prepared mostly in a mechanical way as a routine chore. As a result their main purpose has been defeated.

The preparation of the reports gives an invaluable opportunity to the Governments to assess the progress made for the development of Scheduled Areas and Welfare of Scheduled Tribes, for which they can have plenty of material available from various sources including views expressed by Tribes Advisory Council, Commissioner for Scheduled Castes/Scheduled Tribes, tribal members of the legislatures, non-official members, etc. A proper use of all this material should be made so as to secure a co-ordinated picture for presentation to the President.

However the material available has not been properly utilized. The reports submitted by the Governors lack uniformity both in style and contents. Although the Fifth Schedule provides for issue of directives to the State Governments regarding the format and contents of the report, no directive has been issued so far. This has eroded the importance of the Governor's reports.

3. TRIBES ADVISORY COUNCIL:

The Excluded and Partially Excluded Areas Sub-Committee of the Advisory Committee of the Constituent Assembly which had gone into the tribal situation had recommended the setting up of Tribes Advisory Councils to keep the State Governments in their respective states constantly in touch with the needs of the aboriginal tracts and to exercise special supervisory functions over the working of development schemes. The recommendations of the Sub-Committee have been suitably incorporated in the Fifth Schedule of the Constitution. Clause 4 of the Fifth Schedule of the Constitution provides for Tribes Advisory Council in each State having Scheduled Areas. Besides, if the President so directs, it may also be established in States which do not have Scheduled Areas. The councils have been established in all the 8 states of Andhra Pradesh, Bihar, Madhya Pradesh, Maharashtra, Gujarat, Himachal Pradesh, Rajasthan and Orissa which have Scheduled Areas. In addition, Tribes Advisory Councils have also been established in two states which do not have Scheduled Areas, namely, Tamil Nadu and West Bengal.

Composition: The Tribes Advisory Council consists of not more than 20 members. Of these, three-fourth should be the representatives of the Scheduled Tribes in the Legislative Assembly of the State. In case, the number of representatives of the Scheduled Tribes in the Assembly of the State is less than the number of seats in the Tribes Advisory Council, the remaining seats shall be filled by other members of the Tribes in the State. The Council should consist of persons who have sufficient knowledge of tribal problems and represent all shades of opinions.

Governors are required to make rules prescribing the mode of appointment of members to the Council and its working, etc. In most of the states rules have been framed but adequate provisions regarding appointment of suitable persons, etc. need to be incorporated. In all States, these Councils are headed by the Chief Ministers. It has definite advantages. The Councils are expected to meet at least twice a year. ✓ However, it has been observed that the meetings are not held regularly.

Functions of the Advisory Council: Para.4 of the Fifth Schedule provides that it shall be the duty of the Tribes Advisory Council to advise on such matters pertaining to the welfare and advancement of the Scheduled Tribes in the State as may be referred to them by the Governor. It is also provided that no Regulation shall be made by the Governor unless he has consulted the Tribes Advisory Council. These powers have not been put in practice. The State Governments appear to have given a literal interpretation to this provision and have confined the functions of the Councils only to the questions referred to them. The Tribes Advisory Councils have not been specifically consulted before enacting legislations affecting tribal interest, particularly relating to land and money-lending. It has been argued that the representatives of the legislatures coming from Scheduled Areas have sufficient opportunity to express their views in the legislatures on matters affecting tribes when the subject comes up for discussion. Had it been so, there was no need of a Tribes Advisory Council or other safeguards. In order to make the Council effective, it should be made obligatory to refer all matters pertaining to welfare and development of Scheduled Tribes to it. The position may be clarified to all concerned States, if necessary by issuing a directive. The Tribes Advisory Council was intended to be a channel of discussion about the stages in which the general laws and rules should be applied to the Tribal Areas. Some of the laws which provide special safeguards to the tribes regarding the land tenure, debt redemption and restraints on money-lending were enacted before the commencement of the Constitution. These laws suffer from many loopholes and drawbacks and it is very necessary to review them in consultation with the Tribes Advisory Councils.

The mechanism of Tribes Advisory Council provided in the Constitution is very vital. It should be effectively involved, apart from the legislative process, in policy making, planning and supervision of the development schemes, as well as in effective administration of the Scheduled Areas.

TRIBAL AREAS

The Sixth Schedule applies to Tribal Areas within the states of Assam, Meghalaya, Mizoram and Tripura. The Tribal Areas have been defined under the Sixth Schedule and cover those areas only which are specified in that Schedule. The Parliament, may by law, make changes in the areas included in this Schedule.

✓ The provisions of the Sixth Schedule have been extended to Tripura since July, 1986 by Parliament. The Act provides for the establishment of an autonomous district comprising tehsils and villages which are predominantly tribal. They have been given the powers mentioned in the scheme of District Councils under the Sixth Schedule. In Tripura, there is no provision of autonomous regions.

✓ Main Features of the Tribal Areas:

1. Tribal Areas enjoy full autonomy in respect of matters falling within their jurisdiction. These areas may be called States within a State.
2. It provides to the tribes power of self-management through autonomous districts and autonomous regions.

- ✓ 3. The writ of the Parliament or the State Legislature does not run automatically unless the Acts in whole or part are specifically extended to the Tribal Areas by Notification of the Governor.

Autonomous Districts and Autonomous Regions: There are nine autonomous districts in Tribal Areas of four States viz., two in Assam, three in Meghalaya, three in Mizoram and one in Tripura. Initially autonomous districts of Meghalaya and Mizoram were parts of undivided Assam. Each district has been specified as autonomous district for the purpose of the Sixth Schedule. Normally, an autonomous district represents a particular Scheduled Tribe. In case there are more than one Scheduled Tribe in an autonomous district, the Governor may, by a notification, divide the area or areas inhabited by them into autonomous regions also if so notified. In case of Tripura, the situation is different. One autonomous district has been constituted which covers tribal majority areas extending over three revenue districts and covers several tribes. The Governor has power to increase / decrease or make any alteration in the area of autonomous districts or regions.

Constitution of District Councils and Regional Councils: Each autonomous district has a District Council for its administration. A District Council consists of not more than 30 members. Of these, not more than 4 members are nominated by the Governor and the rest are elected on the basis of the adult suffrage. The District Council consists of territorial constituencies and each of them is a single member constituency. The Governor may fix the total number of the members of the Council. He may prescribe the number of voters. He may reserve all the constituencies for the tribes and debar the non-tribes from contesting the elections in such areas. The Assam Sub-Committee of the Constituent Assembly recommended that the non-tribes, though resident permanently in the hills, should be debarred from contesting the election to the Provincial Legislature from the Hill constituencies. This has been done to protect the interest of the tribes as the non-tribes by their greater financial strength can win the elections in the predominantly tribal constituencies by buying the votes.

Framing of Rules: In exercise of powers conferred by sub-paragraph 6 of the paragraph 2 of the Sixth Schedule of the Constitution, the Governor may make rules for the Constitution of the District Councils and Regional Councils. The rules may provide for the composition of District / Regional Councils, appointment of office for purpose of delimitation of the territorial Constituencies, procedure for delimitation, terms of office of members, qualifications / disqualification of members, election of members, settlement of disputes and election petitions, formation of executive committee of the District Council, summoning of the Council, election of the Chairman, Chief Executive and Members of the District Council, sittings of the Council, etc.

Incorporation of the District/Regional Councils: Each District Council and each Regional Council shall be a body corporate by the name of the respective district or region.

Administration of Autonomous Districts / Regions: The administration of the autonomous Districts/Regions shall be vested in the Councils which shall have only such powers with respect to the areas under the authority of the autonomous District/Regional Councils as may be specified by the Governor. The Governor shall appoint a Chief Executive Counsellor and such members as Executive Counsellors as may be necessary from among the members of the Council. They will look after such subjects as are allotted to them. Executive Council is like a Cabinet for the autonomous district. It lays down policy and ensures its execution.

Powers of the District Councils and Regional Councils to Make Laws: District Councils and Regional Councils shall have the powers in respect of all areas under their respective jurisdiction to make laws with respect to the following subjects:

- The allotment, occupation or use of land, other than any land which is a reserve forest;
- The management of any forest not being a reserve forest;
- Use of any canal or water course for the purpose of agriculture;

tribals, dominated the state legislatures & curbed the powers of the district councils.

- In Meghalaya, Mizoram - tribal leaders at the state level usurped all the powers emasculating the district councils.

Anthropology Paper 02 - Volume 03

- d) The regulation of the practice of Jhum or other form of shifting cultivation;
- e) The establishment of village or town committees or councils and their boards;
- f) Any other matter relating to village or town administration including village or town police and public health and sanitation.
- g) Appointment or succession of Chiefs or Headmen;
- h) The inheritance of property;
- i) Marriage and divorce and
- j) Social customs.

✓ All laws, so made, shall be submitted forthwith to the Governor and until assented to by him, shall have no effect.

Administration of Justice in Autonomous Districts and Autonomous Regions: The autonomous District Councils/Regional Councils in respect of areas under their control may constitute village councils or courts for the trial of suits and cases between the parties belonging to Scheduled Tribes within their respective areas, other than suits or cases relating to offences with death, imprisonment for life or imprisonment for a term of not less than 5 years under the Indian Penal Code or any other law in force. Such powers shall be exercised to the exclusion of any Court in the State. The District Council/Regional Council may appoint suitable persons to be members of such village councils or presiding officers of other courts as also such officers as may be necessary for the administration of justice. Such courts shall also exercise powers of a Court of appeal in respect of suits and cases triable by village council or court. No other court except High Court and the Supreme Court shall have jurisdiction over such suits or cases. The High Court shall have jurisdiction over such suits and cases as may be specified by the Governor.

The Regional Council or the District Council may, with previous approval of the Governor, make rules regulating:

- a) Constitution of village councils and courts and the powers to be exercised by them;
- b) Procedure to be followed;
- c) Enforcement of decisions and orders of such councils and courts;
- d) All other ancillary matters considered necessary for the purpose of dispensation of justice.

The Governor may also confer specific powers for the trial of suits or cases arising out of any law in force in an autonomous district or region for the trial of offences with death, imprisonment for life or imprisonment for a term of not less than 5 years under the Indian Penal Code or any other law in force.

✓ **Powers of the District Councils to Establish Primary Schools etc:** The District Council may establish, construct and manage primary schools, dispensaries, markets, cattle ponds, ferries, fisheries, roads, road transport and water-ways in the district. It may also make regulations, with the prior approval of the Governor, for the regulation and control thereof. In particular it may prescribe the language and the manner in which the Primary education shall be imparted in the primary schools in the district. The Governor may also with the approval of a District Council, entrust entirely, conditionally or unconditionally to that Council or to its officers the functions in relation to agriculture, animal husbandry, community projects, cooperative societies, social welfare, village planning or any other matter to which the executive power of the State extends.

Responsibility of Governor: The Governor enjoys unique position vis-à-vis autonomous districts. Broadly speaking his position may be equated to that of the President's in relation to States. He is not required to send any report to the President regarding administration of the Tribal Areas.

District and Regional Funds: Each District and Regional Council shall have its own fund. All moneys received shall be credited to that fund. The Governor may make rules for the management of the fund. The accounts of the District/Regional Council shall be kept in such form as the Comptroller and Auditor General of India may, with prior approval of the President, prescribe. He may also prescribe the mode of auditing of such funds and the reports shall be submitted to the Governor who shall ask them to lay it before the respective Councils.

Power to Assess and Collect Land Revenue and to Impose Taxes: The District and Regional Councils shall have the power to assess and collect revenue in respect of lands under their control in accordance with the principles followed by the Government of the State. The Councils shall also have powers to levy and collect taxes on lands and buildings and tools on persons residing within the area under their control. The Councils shall have power to levy and collect all or any of the following taxes within their jurisdiction:

- a) Tax on professions, trades, callings and employments,
- b) Taxes on animals, vehicles and boats,
- c) Taxes on the entries of goods into a market for sale therein and tolls on passengers and goods carried in ferries,
- d) Taxes for maintenance of schools, dispensaries and roads. The Councils may make regulation for the levy and collection of taxes and all such regulations shall be submitted forthwith to the Governor and until assented to by him, shall have no effect.

Issue of Licenses or Leases for the purpose of prospecting for or extraction of minerals: Such share or royalties accruing each year from licenses or leases for the purpose of prospecting for, or the extractions of minerals granted by the Government of the State in respect of any area within an autonomous district as may be agreed upon between the Government of the State and the District Council of such district shall be made over to that District Council.

Power to make regulations for control of money-lending and trading by non-tribes: The District Council may make regulations for the regulation and control of money-lending or trading within the district by persons other than Scheduled Tribes resident in the district. In particular, such regulations may:

1. Prescribe that no one except the holder of a license shall carry on business of money-lender;
2. Prescribe the maximum rate of interest which may be charged by a money-lender;
3. Provide for maintenance of accounts by money-lenders and for inspection of such accounts by officers appointed for the purpose by the District Council;
4. Prescribe that no non-tribes shall carry on wholesale or retail business in any commodity except under a license issued for the purpose by the District Council.

✓ All the regulations made on the subject are to be passed by a majority of not less than three-fourths of the total membership of the District Council in order to be valid. All such regulations shall be submitted forthwith to the Governor and until assented to by him shall have no effect.

Publication of laws, rules and regulations under the Sixth Schedule: All laws, rules and regulations made under this Schedule by a District Council or a Regional Council shall be published forthwith in the Official Gazette of the State and shall on such publication have the force of law.

✓ **Appointment of Commission to enquire into and report on the administration of Autonomous Districts/Autonomous Regions:** The Governor may, at any time, appoint a Commission on any matter specified by him relating to administration of autonomous districts/regions in the State. In particular, such Commissions may enquire into and report from time to time on administration of autonomous districts/regions generally and in particular on -

1. The provision of educational and medical facilities and communication in the districts and regions;
2. The need for any new or special legislation;
3. The administration of the laws, rules and regulations made by the District/Regional Councils.

The report of such Commission with recommendations of the Governor shall be laid before the legislature of the State by the Minister concerned indicating the action proposed to be taken thereon.

Annulment or Suspension of Acts or Resolutions of District / Regional Councils: The Governor is empowered to annul or suspend any Act or Resolution of District/Regional Councils, if he thinks that it is likely to endanger the safety of India or likely to be prejudicial to public order.

Dissolution of a District or a Regional Council: The Governor may, on the recommendation of a Commission appointed by public notification, order the dissolution of a District or a Regional Council and direct fresh general elections for the reconstitution of the Council. The Constitution provides that no such action shall be taken by the Governor without giving the District or Regional Council an opportunity of placing its views before the Legislature of the State. In case of dissolution, he may assume himself all or any of the functions or powers vested in the District or the Regional Council, for a period of six months which may be extended by a period not exceeding six months on each occasion.

Every such order with reasons therefore shall be laid before the Legislature of the State and shall cease to operate at the expiry of thirty days from the date on which the State Legislature first sits after issue of the orders unless approved by the Legislature before expiry of that period.

Exclusion of Areas from Autonomous Districts for Forming Constituencies in Districts: For the purpose of elections to the Legislative Assembly of Assam or Meghalaya etc., the Governor may by order declare that any area within the autonomous district shall not form part of any constituency to fill a seat in the Assembly reserved for any such district but shall form part of a constituency to fill a seat in the Assembly not so reserved.

The mechanism of the Sixth Schedule ensures effective participation of the tribes in administration of their affairs. Extension of the provisions of the Sixth Schedule to more tribal majority areas particularly, in the middle tribal belt will create more confidence among them and give them a sense of participation. As already mentioned, while the Fifth Schedule is paternalistic, the Sixth Schedule is participative. It reflects a phase of development and provides good ground for training in administration.

DISTINCTION BETWEEN FIFTH SCHEDULE AND SIXTH SCHEDULE:

The Fifth Schedule applies to the Scheduled Areas which have been specified in eight states and the Sixth Schedule applies to Tribal Areas which have been specified in four states. Under the Fifth Schedule, laws passed by Parliament or by the State Legislature apply automatically to Scheduled Areas unless the Governor declares it otherwise in respect of law or part thereof. Under the Sixth Schedule, the position is quite different. The law made by Parliament or State Legislature for Tribal Areas shall not apply unless the Governor extends that law to such areas. In one case, it applies unless excluded and in the other, it does not apply unless extended.

The Fifth Schedule confers substantial powers on the Governor which in practice are exercisable with the aid and advice of the Council of Ministers. He can make laws by Notification or by Regulation. The Governor may exclude the application of an act of Parliament or State Act in a Scheduled Area or may direct that it will be applicable subject to such expansion or modification as may be specified in his Notification. But so long as the Governor does not make any such Notification, the general Acts of Parliament or of the State Legislature shall apply to the areas referred to in the Fifth Schedule. The Governor has been vested with Regulation making powers for peace and good government and in particular, for prohibiting or restricting the transfer of land by or among the members of the Scheduled Tribes, regulating the allotment of land and carrying on the business of money-lending in Scheduled Areas. This power of the Governor extends to all the entries in the three lists i.e. the Union List, the State

List and the Concurrent List of the Seventh Schedule. Only restriction to the exercise of the power is that Regulation must be made after prior consultation with the Tribe Advisory Council and assented to by the President.

The Sixth Schedule envisages a special administrative mechanism of self-government to the tribes inhabiting the tribal areas. The laws made by the Parliament or State Legislature do not run automatically in these areas unless applied by a Notification of the Governor. The laws are either made by the District Councils or are applied by them.

The administration of justice is achieved by District and Regional Councils through their own agencies. The jurisdiction of the High Court and the Supreme Court over the District and Regional Councils is not barred. The power of the High Court to entertain suits or cases of tribal areas is subjected to regulation by an order of the Governor.

The District and Regional Councils have their own funds. They enjoy power of taxation and establishment of certain local institutions and run primary schools, dispensaries etc. They have complete autonomy so far as their powers and jurisdiction are concerned. The veto is, however, exercised by the Governor who can annul or revoke their Acts or resolutions or dissolve them and take over their administration.

In short, while the Fifth Schedule is paternalistic, the Sixth Schedule is participative. Its mechanism ensures autonomy and effective participation of tribes in the administration of their own affairs. In the case of the Fifth Schedule, although the Governor has been vested with certain powers for ensuring their protection and better administration, there is no mechanism by which these provisions can be made operational. The exercise of powers under the Fifth Schedule has been left to the Governor or, in practice, to the State Government.

SPECIAL PROVISIONS WITH RESPECT TO TRIBAL AREAS AND HILL AREAS IN NAGALAND, ASSAM AND MANIPUR:

The Constitution contains special provisions under Articles 371-A, 371-B and 371-C with respect to the State of Nagaland. Tribal Areas of Assam, as specified in Part-I of the Table appended to paragraph 20 of the Sixth Schedule and the State of Manipur respectively.

Nagaland Assam Manipur
Article 371(A) - Nagaland: As per provisions of Article 371(A), no Act of Parliament in respect of the following matters shall apply to the State of Nagaland unless allowed by a special resolution of the Nagaland Assembly. The matters are:

1. Religious or social practices of Nagas;
2. Naga customary law and procedure;
3. administration of civil and criminal justice involving decisions according to Naga customary law; and
4. Ownership and transfer of land and its resources.

The Governor has a special responsibility for law and order in the State of Nagaland. He has Regulation making power for peace, progress and good government of the Tuensang district. No Act of the Legislature of Nagaland shall apply to this district unless the Governor, on the recommendation of the Regional Council, specifically extends it by a public notification.

Article 371(B) - Assam: The President may provide for the Constitution and functions of a committee of the Legislative Assembly of the State consisting of members of that Assembly elected from the tribal areas as specified in the Sixth Schedule and such other members of that Assembly as may be specified in the order. This Committee has been provided to look after the interests of Tribal Areas at the State Level.

Article 371(C) - Manipur: Article 371(C) provides for the Constitution and functions of a Committee through a Presidential Order. The Committee shall consist of members of the Legislative Assembly elected from Hill Areas of the State. The Governor has been required to make annual report to the

✓ President regarding the administration of the Hill Areas in the State of Manipur. The Union Executive has been empowered to issue directions to the State as to the administration of the said areas.

Constitutional Safeguards and Welfare of Other Backward Classes in India

The term "Backward Classes" include Scheduled Tribes (STs), Scheduled Castes (SCs), Denotified Tribes and Other Backward Classes (OBCs). These classes of Indian population have labored under different and distinct disadvantages in the Indian social system. They have suffered from social and economic disabilities and have come to be known as Backward Classes. The SCs and STs are identified as a result of different lists revised and issued under the Scheduled Castes and Scheduled Tribes Lists Modification Order, 1956 whereas the Denotified Tribes are defined under the Criminal Tribes Act, 1924. However, a precise definition of "Other Backward Classes" has eluded so far. It has been fully realized that special arrangements would have to be made for them in order to bring them to a position of equality with other citizens. The Constitution of India therefore provides protection and safeguards for SCs, STs and OBCs either specifically or by way of promoting general rights of citizens with an object of promoting their educational and economic interests and of removing certain special disabilities they were subject to.

The relevant legal provisions are embodied in Part XVI of the Constitution of India, which is entitled "Special Provisions relating to certain classes". From these provisions it is evident that in 1950 the makers of the Constitution visualized the need to make special provisions only for the SCs, STs, Anglo-Indian Community and Socially and Educationally backward classes.

For these special categories of persons, the Constitution has provided for different level and types of concessions. The SCs and STs, under Articles 330 and 332, seats in the Lok Sabha and Vidhan Sabhas were required to be reserved on the basis of their population. It was envisaged that these reservations of seats would be available for a period of 10 years only. With subsequent amendments to the Constitution, this period has been extended from time to time and these provisions are still in force.

For the Anglo-Indian community, the facility of reservation of seats in the Lok Sabha was also provided to the extent of two seats by nomination by the President, in case he found that his community did not have enough representation. A similar provision was also made for the representation of Anglo-Indians to the Vidhan Sabhas. There is no provision in Part XVI for reservation of seats in legislatures for socially and educationally backward classes.

The other category of special-provision under Part XVI relates to appointment to services and posts in connection with the affairs of the Union or of a state of the SCs and STs and the Anglo-Indian community. For the Anglo-Indians, Article 336 provides reservation in the Railways, Customs, Postal and Telegraph services of the Union Government on the same basis as they were available to them immediately before August 15, 1947. These reservations however, were to be available for a period of two years by 10 percent and it was also envisaged that there should be no reservation for them from the year 1990 onwards. For the SCs and STs however, Article 335 of the Constitution provides that consistent with the maintenance of efficiency of the administration, the claims of the members other SCs and STs shall be taken into consideration in the making of appointment to services and posts in connection with the affairs of the Union or of the States. In other words, unlike in a case of Anglo-Indians, there was no fixed quota for the SCs and STs. Secondly, there was no cutoff period of two years or ten years in the matter recruitment of SCs and STs to the services and posts. Thirdly, the reservation for Anglo-Indians was to be enforced, irrespective of the effects of it on the efficiency of administration, but in the case of the SCs and STs, their claims for recruitment to public services had to be consistent with the requirement of the maintenance of efficiency of administration. Lastly, while the Anglo-Indians could compete on merit and yet enjoy their quota there was no such facility envisaged for the SCs and STs. Yet another special provision made available for Anglo-Indians by way of added facility, was for educational grants. It may be noted that the Constitution does not make provision for any such facility under Part XIV for the SCs and STs or for socially and educationally backward classes.

As regards the socially educationally backward classes, now popularly called OBCs, the only special provision for them is under Article 340 of Part XIV of the Constitution which is extracted below:

Article 340 – Appointment of a Commission to Investigate the Conditions of Backward Classes:

1. The President may by order appoint a Commission, consisting of such persons as he thinks fit, to investigate the conditions of socially and educationally backward classes within the territory of India and the difficulties under which they labor and to make recommendations as to the steps that should be taken by the Union or any state to remove such difficulties and to improve their condition as to the grants that should be made for the purpose by the Union or any state and the conditions subject to which such grants should be made and the order appointing such Commission shall define the procedure to be followed by the Commission.
2. The Commission so appointed shall investigate the matters referred to them and present to the President a report setting out the facts as found by them and making such recommendations as they think proper.
3. The President shall cause a copy of the report so presented together with a memorandum explaining the action taken thereon to be laid before each House of Parliament.

The President of India had accordingly appointed a Backward Classes Commission headed by Mr. Kaka Saheb Kalekar in January 1953 under Article 340 of the Constitution of India to determine the criteria for treating any sections of the people, other than the SCs and STs, as socially and educationally backward; and in accordance with the criteria thus determined, to prepare a list of such classes. The report of the Commission submitted in March, 1955 disclosed considerable divergence of opinion among its members, but the majority recommended that the basic criterion for identification of the "Other Backward Classes" should be their low social position in the traditional caste hierarchy of Hindu society and accordingly prepared a list of almost 2700 communities, and estimated that 930 of them would alone account for nearly a third of the country's population. The Commission also considered women as a class to be backward. While placing the report of the Commission before Parliament in September 1956, the Government of India observed that if the bulk of the country's millions were to be regarded as coming within the category of backward classes, no useful purpose would be served by separate enumeration of such classes. Pt. Jawaharlal Nehru was of the view: "It is basically wrong to label any section of the people as backward, even if they were so when 90 percent of the people in the country were backward and poor. It is, therefore, clear that the classes to be specified should be distinctly and palpably more backward socially and educationally than the general run of the population". Government also endorsed the view expressed by the Chairman of the Commission that acceptance of caste as a criterion of backwardness was not a correct approach and that the remedies suggested on the basis of caste would be worse than the evil of backwardness itself. The Report was rightly shelved by Pt. Nehru as such an approach was bound to lead to compartmentalization of society.

The Government after finding the controversial recommendations of the Kalekar Commission unacceptable, decided to undertake further studies to arrive at objective and workable criteria for identifying other backward classes. The Deputy Registrar General of Census was asked to conduct a pilot study of occupations which could be considered backward. But his effort did not yield any useful result because he found it impossible to draw up any precise and complete list of occupations, the members of which could be treated as socially and educationally backward. The Government of India elicited the views of the state governments on the issue. One state advocated identification of backward areas rather than backward classes. The Planning Commission accepted this concept later on. Some states favored adoption of economic backwardness as a criterion, while others stuck to their existing caste based lists of OBCs. The Central government was, however, under no legal compulsion to draw up an all India list of socially and educationally backward classes and that even if such a list were to be drawn up, the state governments were free to have their own lists. It was also felt that any further exercise in stratification of the population into special groups and classes would only further foster existing divisive tendencies, and run counter to the national objective of establishing an egalitarian society. The Government of India,

therefore, informed the state governments in 1961 that they had "after careful consideration, decided not to draw up any all-India list of backward classes (other than the existing list of SCs and STs) and while the State government had the discretion to choose their own criteria for defining backwardness, it would be better to apply economic tests than to go by caste".

WELFARE SERVICES

During the first three Five Year Plans, the Central Government had made a provision for Rs. 1.62 crores (First Plan), Rs. 5.02 Crores (Second Plan) and Rs. 6.00 Crores (Third Plan) for the welfare of OBCs and almost all the schemes implemented were in the field of education. Till the end of Third Five Year Plan, an annual financial provision of Rs. 40 Lakhs used to be made in the Central Sector for post-matric scholarships awarded from merit cum means basis. From the Fourth Plan, the scheme had been transferred to the state sector. For the Fifth Year Plan, the total financial outlay for all States was Rs. 17.25 Crores; of which more than 2/3rd had been on educational program, mostly for pre-matric scholarships and provisions of hostels. Economic development schemes, on which the expenditure was a little over Rs. 3 Crores, included financial assistance in the form of loans and grants to artisans and industrial cooperatives; to agriculturists for irrigation wells and purchase of bullocks and implements.

Besides such special assistance earmarked in the backward classes sector of the Central and various other state plans, the OBCs had derived benefits during the Fifth Plan from the special rural area programs such as Programs for Rural Development mostly in the agricultural sector; Minimum Needs Program; Drought Prone Areas Program; Small Farmers Development Agencies; Marginal Farmers and Agricultural Laborers Projects; Food for Work Program; Rural Employment Projects; Milk Production Program; Rural Electrification Program; Provision of House-sites for Landless Persons; and liquidation of bonded labor and rural debt which were directed towards raising substantially the per capita monthly consumption of the lowest 30 percent of rural population. In the Sixth Five Year Plan also much greater emphasis had been laid on the improvement of conditions of the families which were below poverty line.

✓ There is no voluntary organization working at the national level, which caters exclusively to the OBCs. Voluntary organizations existing at the State, local and caste level are financially assisted by the State governments. The government of India however affords annual grants to the Servants of India Society, Pune, which assists some OBCs besides SCs and STs in Maharashtra, to the Indian Red Cross Society to operate in Backward Regions and other NGOs.

⌚ No plan allocations are now being made by the Central Government for the welfare of OBCs. The Programs for their welfare are launched by the respective state governments or Union Territories but the quantum of funds provided by them for the purpose is very meager. For instance, Karnataka, Tamil Nadu, Jammu and Kashmir spent only 2.4 percent, 0.2 percent and 0.46 percent respectively of their annual budget of recent years on schemes specifically prepared for the OBCs.

MANDAL COMMISSION

✓ It was left to the Janata Government to disturb the hornet's nest in 1978 by again raking up the issue by the appointment of the Second Backward Classes Commission headed by Mr. B.P. Mandal. The Mandal Commission was to determine the criteria for defining the socially and educationally backward classes. It was to recommend necessary measures for the advancement of the backward classes, so identified. In particular, it was required to examine the desirability or otherwise of making provision for reservation of appointments/posts in favor of these classes who otherwise do not find adequate representation in the public services.

The Commission applied 11 indicators groups as social (4), educational (3) and economic (4) for identification of the socially and educationally backward classes. It was guided by the thesis that social and educational backwardness would be directly linked with low status of certain castes in respect of the Hindus, in the case of those belonging to occupational groups such as dhobi, teli, jheemar, nai, gujar, kumhar, lohar, darji, and badhai, could be deemed as socially and educationally backward. Of the total

population of India 52 percent belong to these classes. These are other than the SCs and STs who make 22.5 per cent of the total.

The recommendations of the Mandal Commission can be summarized as follows:

1. Twenty seven percent of the posts in public services should be reserved for OBCs. They do make 52 percent of the total population yet the reservation quota for them cannot exceed this limit. This is because according to the law as interpreted by the Supreme Court of India, the total quantum of reservations under Articles 15(4) and 16 of Constitution should be below 50 percent and as at present, 22.5 percent of the government jobs are already reserved for the SCs and STs on pro-rata basis of their share in the population.
2. Welfare programs specially meant for OBCs should be financed by the Government of India in the same manner and to the same extent already done in the case of SCs and STs.
3. Radical land reforms should be brought about in States to free small land holders from their heavy dependence on rich peasants for their subsistence.
4. OBCs should be encouraged and helped to set up small scale industries.
5. Special educational schemes, with emphasis on vocational training, should be started for OBCs; they should also be given special coaching in technical and professional institutions to enable them to compete with the students from the open quota.

The Commission has submitted its report to the Government on December 31, 1980. It was presented to both the houses of the parliament on April 30, 1982. Even since then there has been a continuous and persistent demand for an outright acceptance of its recommendations without any further scrutiny. But no government however favorably inclined could accept an additional 27 percent representation in serves to over 3000 castes thus making a total of 52 percent including the already existing reservation for SCs and STs. That is why the then Congress government even though keen to exploit this populist measure, had to refer the report to a Committee of Secretaries who found it full of infirmities and inconsistencies fraught with adverse consequences for the social fabric of the country. Most of the Chief Ministers also expressed their views against this out and out caste based approach to backwardness and felt that in varying and different conditions from state to state, and since most of the states have already evolved a policy of providing reservations to backward classes, there is no need of a Central Scheme and the matter be left to the states.

✓ The then Prime Minister Mr. V.P. Singh announced, all of a sudden, the acceptance of the Mandal Report on August 7, 1990 in the Parliament. This drastic move has upset people from many walks of life, including students, academics, journalists, etc. The student community that had been seriously hit by the implementation of the Report had launched a massive movement throughout the country and initially brought the government to a point of collapse. The anger and anguish manifested itself in protests, rallies, violence, clashes and even self-immolation in an unprecedented manner.

A Critique of the Report

1. The Commission seems to have been carried away by its enthusiasm in inviting castes to come forward with such a claim. Otherwise, how is it that between the Kalekar Commission and 1978 over 1000 castes have gone "backward", increasing the number from 2700 to over 3700? The Mandal Commission violates the constitutional provision prohibiting any discrimination based on caste or religion in recruitment to services and goes against the special provisions for SCs and STs.
2. The Mandal Commission, by recommending 27% representation for BCs has exceeded the 50 percent limit laid down by Supreme Court, including representation for SCs and STs. And what a farce of special representation if 70% of the population is clubbed as "backward" and keeping floodgates open for more and more castes competing for "backwardness". Why not

defined the "forward" classes, which would be easier, provide special representation to them and leave the rest to backward classes?

3. The Mandal Commission recommendations open the floodgates of special representation to Muslims, Jains, Buddhists, Christians and so on, leading to disintegration rather than harmony in the society.
4. The Commission has disregarded the observations of the Supreme Court that "social backwardness is a result of poverty to a large extent. Caste and poverty both are relevant to backwardness but neither caste nor poverty alone could be a determining factor. To illustrate, how could a barber by caste sets up a modern haircutting saloon or a tailor with cutting edge technology or a dhobi starting a modern laundry be considered "backward"?
5. In fact, changes have taken place by abolition of Zamindar, Jagardari and other land reforms as well as liberal loans for self-employed resulting in upper mobility so as to remove all vestiges of "backwardness". Even though this process is not yet complete, we shall allow this to take a quick forward direction rather than reverse the order by creating vested interest in backwardness, just to obtain a few thousand government jobs.
6. A pernicious result of the Mandal Commission recommendations is to create multiple leaderships in 4,000 castes to serve the political ends of the parties serving as vote gatherers and agents – backward class elite appropriating all concessions to them and in the process exploiting their own community.

The Mandal Commission Report was challenged in the Supreme Court of India on the following grounds. The Caste-data used by the Mandal Commission are based on the census report of 1931. Since then, nothing short of a qualitative change has occurred in the Indian scenarios but Mandal takes no account of it. The Commission has erroneously thought that it was its duty under Article 340 of the Constitution to recommend job reservation for the backward classes. The Mandal Commission virtually rewrites the Constitution by providing preference to the 3,743 backward castes, by reducing the status of forward castes as of second class citizens. Casteism which the Constitution emphatically intended to end was revived by the report and ideals were buried by it. The Commission has ignored certain principles laid down by the apex court that efficiency of administration should be borne in mind when reservations were made and unreasonable, excessive or extravagant reservation was a fraud on the Constitution. There had never been more flagrant disregard of these principles.

The Mandal Commission Report is casually and hastily prepared document which is replete with errors of all kinds. In order to give itself a veneer of rationality and objectivity, the Mandal Commission sought to impart to its report a research base, but even a superficial reading would disprove the claim.

WELFARE OF DENOTIFIED COMMUNITIES IN INDIA (Vishwakarma)

(20) Denotified Communities consist of several groups which may broadly be classified into nomadic groups & semi-settled communities. The nomadic group includes gypsy like people, while the settled and the semi-settled groups trace their descent from irregular fighting clans, who were uprooted from their original homes on account of invasions or political upheavals in the distant past. Before settlement in colonies, they used to make a living out of hunting, snake charming, selling medicinal herbs and other goods. The innate spirit of adventure coupled with extreme poverty, lack of openings for better economic conditions and also other psychological factors led them to take to criminal practices which later became a tradition and a part of their heritage.

CTA-1871

198

Under the Criminal Tribes Act, 1924, these groups which numbered about 127 and whose population was 24.64 lakhs in 1951, were dubbed as criminal tribes. Thus, when a child was born of these tribes, he was considered to be criminal from the very beginning and on his attaining the age of majority, he was automatically registered criminal, even though he might have been totally innocent. These people were kept in colonies, sometimes fenced with barbed wire and under strict vigilance of the police. Quite often,

(ii) Over 200 communities identified as Criminal tribes by British under Criminal Tribes Act-
 (i) CT are those identified as criminal tribes under CTA-1871 & 1924
 (iii) these groups because of poverty coupled with innate spirit of adventure took to crime in the past. Later their children by birth are branded criminals

- (a) Designate DNTs as "Schedule group" with special quota of 10%.
- (b) Separate National Commission for DNTs.
- (c) As per ↗ 150 tribes & 500 nomadic communities are denotified = 10% of country's pop.

Anthropology Paper 02 - Volume 03

they were made scapegoats for undetected crimes. In these settlements, the registered persons were interned for a prescribed period during which they were taught agriculture or certain handicrafts. The movement of these settlers was restricted within that area. Thus, these notified groups had to wear a dark cloak of notoriety around them. This deprived them of all channels of employment.

After independence, the national government realized the injustice of dubbing the whole community as criminal without exception. Apart from being repugnant to the fundamental principles of jurisprudence, it was socially unjustifiable and nationally wasteful to maintain a whole community, generation after generation, in bondage. The government therefore appointed a Criminal Tribes Enquiry Committee in 1949 and on its recommendation repealed the Criminal Tribes Act with effect from August 31, 1952 and the restrictions imposed on those people were withdrawn. ~~replaced by Habitual Offenders Act~~

(4) The Backward Classes Commission 1955 had inter-alia recommended that:

1. The nomenclature of these classes may be changed from "criminal" to "Denotified Communities"
2. These communities may be divided into Scheduled Tribes, Scheduled Castes and other Backward Classes for getting the benefits available to the categories concerned
3. These communities may be distributed in small groups in towns and villages where they will ultimately come into the contact with other people and will eventually be assimilated in society
4. Normal instruction together with basic education followed by vocational and technical education at secondary level should be given to them.
5. The children of the criminal groups should be removed from their parents on attaining the age of seven and should be put in suitable hostels.

After the legal withdrawal of the limitations and restrictions in 1952, the first problem was to wean them away from the criminal tendencies, particularly the younger generation and remove the stigma attached to them and secondly to put before them opening to useful occupations which would make it possible for them to live honorably. The total allotment under the First Five Year Plan both at the centre and states for these communities and other backward classes was Rs. 3.5 crores. By the end of this plan period, about 17 settlements and 30 colonies had been setup; more than 36000 families had received assistance for agricultural development; 113 cooperatives had been organized and 337 industrial centers were setup for their benefit. The Second Plan made an allocation of Rs. 3.12 crores for the welfare of these communities. The major schemes were housing and educational development. Apart from agriculture and cottage industry, another possibility of leading a life of honest means can be by getting employed in government services, private firms, factories etc. But even though the Act has been repealed and theoretically there is no bar to getting employment, yet the stigma attached to those belonging to these communities does not make it easy to secure them employment.

In view of the small results achieved thus far, their needs should be studied in each area and programs could be drawn up on the basis of the following suggestions of the Study Team setup by the Committee on Plan Projects:

1. The need for a combined correctional and welfare approach for the rehabilitation of Denotified communities which should be supported by a program of social education;
2. Formulation of special economic programs which keep in view the character of the population, in particular, their adventurous spirit and traditional skills;
3. Organization of industrial and other cooperatives;
4. Provision of opportunities for employment in the public services supported by way of additional training and orientation facilities; and

- (8) (i) → favours creation of cluster development fund for existing DT for construction of houses, providing land, creating infrastructures.
- (ii) → skill development initiatives of Central & state govt to give priority to cover unemployable youth among these tribes.

Anthropology Paper 02 - Volume 03

5. Where the Denotified tribes constitute a sizeable population, cadres of trained workers, who are familiar with their social and cultural background and can work closely with them, should be built up.

The objective of assimilation, emphasized by the Third Plan should guide the program of rehabilitation and development from the very start and progressive and forward-looking elements among the Denotified tribes themselves should be assisted and encouraged to play an increasing part in this effort.

In pursuance of these observations and recommendations and in view of the urgency of early rehabilitation of the Denotified tribes, all the schemes were implemented under the centrally sponsored programs. Economic development and social progress of these communities were given due emphasis for which around four hundred lakhs was made available. In the Fourth Plan, all the schemes were continued with an allocation of around four fifty lakhs.

The pattern of implementation of schemes was again changed in the Fifth Plan period when all the welfare schemes for the Denotified tribes were transferred to the state plan sector. These schemes have continued to be implemented in the 6th and 7th Plans by the respective state governments. The schemes include educational programs in the form of granting of scholarships and stipends to eligible students, tuition and examination fees, provision of mid-day meals and establishment of Ashram Schools, residential schools and hostels; Programs for economic development, rehabilitation, colonization, assistance for agriculture and organization of cooperative societies; Miscellaneous schemes like setting up of community welfare centers, balwadis, digging of drinking water wells etc.

(9) ✓ Much more could have been done for the welfare of the Denotified tribes, had there been a statutory provision for their welfare as there has been for the protection and promotion of interests of scheduled castes and tribes in the various articles of our Constitution. The Denotified tribes are entitled to certain benefits and concessions under the general provision of Article 41 of the Constitution of India which stipulates the promotion of educational and economic interests of the scheduled castes, scheduled tribes and other weaker sections. It is desirable that the various safeguards, concessions and benefits available to the scheduled castes and tribes should be extended to them also under the statutory provisions to be made by the Parliament through an amendment of the constitution.

Coz they are
not able to get
benefits in
either ST, SC or
OBC category

There is also the need to identify their complex problems which vary from state to state due to their habitation, ecology, traditions and cultural ethos, and to find their remedies especially of their rehabilitation in vocations suited to their genius and to wean them away from their criminal tendencies, particularly the children. This can be achieved to a great extent by formulating comprehensive and integrated plans to provide them land and the financial facilities in the form of loans/subsidies for agriculture, agro-based cottage industries, housing, education etc. Voluntary organizations have been playing appreciable role in their rehabilitation and welfare. They need to be involved in larger measure to complement the government efforts in ameliorating the lot of the Denotified tribes with a view to integrating them in the mainstream of the Indian society and enabling them to live as respectable citizens of the country.

Conclusion

→ 2011 - population

→ 11th & 12th plan → Denotified tribes?

(*) CSC - May - page - 96 - 12th plan for
Denotified tribes

(6) ✓ → Mahasweta Devi - Worked for DT for 3 decades

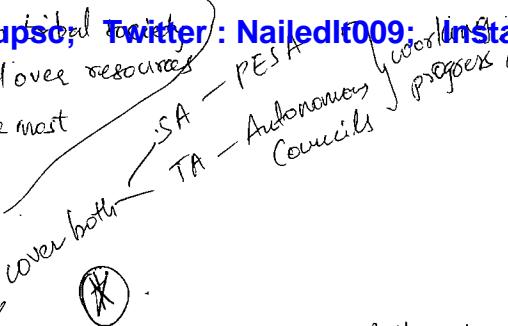
Min of Social Justice, Empowerment

(7) ✓ → 2006 - National Commission for Denotified, Nomadic, Semi-Nomadic Tribes (NCDNT)
recommended equal reservations as available to SC & STs

(8) → Min of SJE - implements a Central Sector scheme of National Overseas Scholarship for SC - Under this out of 30 awards, 2 are for DT

(9) Tribe names - Bangalee Baras, Nat, Gondhila, Sansi, Tangus, Dhinwara, Bawana, Bhatu, Kanjar 249 ; Yerkela, Yenadi

- Disparities have increased due to loss of control over resources
- Barring few tribes, tribals remain among the most backward & poorest sections of our population.



Anthropology Paper 02 - Volume 03

7.2 Social Change and Contemporary Tribal Societies

Impact of Modern Democratic Institutions, Development Programs and Welfare Measures on Tribal and Weaker Sections

It is believed that the Scheduled Castes and Tribes have registered little progress in the last five to six decades. There has been a quality of ritualistic formalism about many welfare and development schemes formulated for these people. The financial incentives and educational reservations have bestowed little real benefit to these castes. The quality of education has been described as unrelated to their lifestyle. No efforts have been made to induct them into the new ethos of learning and to inculcate in them the verbal and non-verbal skills that are a precondition to an academic success. The dropout rate at the school and college/university levels has assumed alarming proportions. At the university/college level, the teachers complain that the Scheduled Caste (and Scheduled Tribe) students are seen only when their scholarship cheques are received from the Social Welfare Department. They mostly remain absent from the classrooms. Though their percentage of attendance remains very low, yet they appear in examinations only because of the policy of the university administration to withdraw the percentage of compulsory attendance at the last moment. That the quality of their education is poor is evident in their performance at the entrance tests for professional courses. An example shows that in 1989 in Madhya Pradesh, so few Scheduled Caste and Scheduled Tribe students qualified at the entrance tests for professional colleges that the minimum eligibility marks for them had successively to be lowered. For engineering studies, the students of unreserved quota had to have at least 50 per cent marks; for the Scheduled Castes, the prescribed minimum was 35 per cent. Eventually, the Scheduled Caste students with 15 per cent marks had to be admitted.

Since colonial conquest
The tribal people have not been in continuous and complete isolation. Contacts are there between them and their non-tribal neighbours. Modern forces have been actively moulding their life. As culture is dynamic, the tribes have faced and are facing changes. Nevertheless the tribes have retained the principal elements of their ways of life, though these are modified to a greater or lesser extent.

The factors responsible for the transformation of the tribal societies are both traditional and modern. The ① traditional process, characterized by the impact of certain traditions of the major neighbouring communities on the tribal group, has long been in operation and has led to the resultant concepts like Hinduization, Sanskritization, Tribe Caste continuum, Revitalization movements etc.

② The modern processes include such factors like Christianity, Urbanization and industrialization. Tribal development schemes, democratic set up of the nation, modernization in education, communication, and administration and the like are of recent origin. These are directly or indirectly working as the external factors which do not emerge as a result of the direct and normal contact of the tribal people with the non-tribal people of the areas.

Welf. Prop. ②
The implementation of various types of development, welfare and community development schemes meant for the tribal areas have brought about certain economic and social changes in the tribal communities. During the pre-independence period it was the policy of the British government to let the tribes live in isolation and maintain their status quo. However, after independence, in 1947, the national leaders undertook the programs of tribal welfare on a top priority basis and the policies and programs of the nation are reflected in the Constitutional provision specially in the Articles 46, 275 and 339 which put special emphasis on the promotion of tribal welfare and safeguard the interest of the STs and the Scheduled areas.

Further, in view of the Constitutional provisions, the general democratic upsurge, and the zeal of the national leaders for social service, the official and non-official organizations undertook the programs for tribal welfare from time to time.

Also during the Five Year plans an attempt has been made for bringing about a comprehensive and integrated change in the social, economic, political and cultural life of the tribal people. But the overall result of this great effort has not been as encouraging as expected. Rather it is disappointing. Various evaluation reports and a few competent analytical studies of the tribal development works are available. These by and large record the targets of development and speak of the reasons of failure attributing it mainly to:

- W.P. ①
1. Socio-cultural factors hindering the acceptance of an innovation, and
 2. Lack of personnel or right motivation and correct attitude to work in the tribal areas.

The above is not meant to criticize but rather make a statement of fact. It cannot be denied that the welfare measures undertaken during the Five Year Plans in the tribal areas are well intentioned. They aim at an all round development to creating conditions in which they can contribute their best to the total growth of the country. Adequate resources have all been invested for their economic growth and for removing the stagnation of the tribal areas. And in fact development schemes have been able to break the stagnation of the closed tribal society to some extent and have been able to introduce innovations and new ideas to the tribal communities. But, as already stated the change in the tribal way of life is not so distinctly felt, the isolated and relatively more backward tribal communities have been less affected than the acculturated and some what advanced communities.

W.P. ②

- a In the sphere of economic development, the terrace cultivation has to some extent replaced the shifting cultivation among the Nagas, Kukis, Khasis and the Garos. They have been able to take quick advantage of the development schemes during post independence period as there existed awareness among them owing to the spread of education and awareness through the Christian missionaries. The Malets of Bihar, the Porojas of Orissa, however, could not take such an advantage, as they lacked preparedness and continued to remain isolated even during the contemporary times. Similarly, the tribes which have been influenced by their Hindu neighbours, like the Oraon, Santhal, Munda, Bhil and Gond, took advantage of the community development programs and accepted the use of improved seeds, fertilizers, introduction of cash crops etc., only to some extent. However, the health program along with the introduction of modern medicines is becoming popular in the less isolated villages nowadays.
- b Few tribes could take the advantage of Nilgiri Railways.

Through the introduction of Panchayat Raj, the traditional Panchayats have suffered a setback but a compromise between the traditional and statutory Panchayats in the tribal areas has taken place, especially in the Himalayan region and in certain parts of the middle and western India. In some tribal areas, however, the statutory Panchayats are refused to be accepted as the traditional Panchayats as they have their own stronghold.

D.I. ②

In the sphere of modern democratic experiments, the periodical elections to elect representatives for parliament and the state legislatures and village Panchayats have created a new awareness among the tribal voters regarding their political rights, power alignments and functional roles of the leaders. To the simple and the semi isolated tribes, the traditional sacred and secular village headmen, and of late the Christian religious priests, were the only persons known as leaders to help them in decision making. With the formation of the Indian Republic, however, the tribal voters, some of them in inaccessible areas, are being approached by leaders of various types, and exposed to their views, promises and aspirations. With various Constitutional safeguards for the STs and the general democratic upsurge, the tribal areas are getting politically energized. A new set of Western educated, urban-bred and secularized type of tribal leaders is fast replacing the age-old charismatic, rural-bred and tradition-oriented leadership. These modern leaders of various levels and types are spearheading the social, economic and political change, and during the last two decades, they have been greatly instrumental in accelerating the pace of transformation in the tribal areas. Still these tribes politically behave in their traditional style, that is with kin feeling, village feeling and regional feeling and the new democratic experiments have given more impetus to these feelings. In, general, the tribal development schemes and the modern democratic experiments have broken the stagnation. In fact, they have accelerated the transformation.

D.I. ① Conclusion

Impact of PRI, PESA was mixed.
+ 6 points - pg-175.)

D.I. ⑥ D.I couldn't solve existing problems of land displacement effectively. 251.
Blts - traditional leaders took charge
Ho - revolt
Santhals - transition was peaceful

Unlike the problem of development in the rural areas of the country, that of the development of scheduled tribes and the tribal areas is not merely one of higher productivity, increased incomes and raised levels of consumption. It bears emphasis that the tribal areas have remained secluded from other areas and sections of society for long centuries. Almost every one of the tribal communities, as a result, evolved its own distinctive ecosystem, culture and individuality. By and large, the general concept of development in the post-independent India, may not accord with their idea system. On the contrary, it's not unlikely that the new Western and industrial cultures sought to be introduced into the tribal areas might strike discordant notes in the harmony achieved by the tribal people through a fine balance of the various forces at work.

The exhortation of the late Prime Minister of India, Pandit Jawahar Lal Nehru, that the tribal people should be enabled to advance along the lines of their own genius, has therefore a strong relevance even today. It would have been befitting if each of the schedule tribe community were to deliberate over and decide the course of its development. The decision might have been taken in the light of its cultural background, the present level of development and the projected needs. But since some of the scheduled tribe communities lack adequate articulation, the communication gap acts as a barrier to concretising the right type of blue print for development.

Differing action for development till the tribal people make clear their choice of the path of the destiny may not be a feasible course, for some inaction at this stage might widen the existing disparity between the non-tribal and tribal section. The option left is that development plans should be forged with the degree of association of the tribal representatives, taking into consideration, their natural resource endowment, the occupational pattern, the aptitude and skills and the general psyche of the people.

(Dhebar) ✓ The Dhebar Commission of 1961 observed, "Throughout the whole of tribal India, every substantial village has some kind of machinery for settlement of social and religious disputes". They felt that the tribal councils have great potentialities. These represent the cooperative and communal temperament of the people, having been established in history and traditions and supported by social and religious sanctions. They recommended that the councils should be used not only to maintain the fusion of the a tribal institution but also to further progress of the development throughout the tribal area. Statutory Panchayats might exist along side the tribal councils and the latter may be given various aspects of development.

(Shilu Ao) b) The study team on tribal development programs headed by P. Shilu Ao drew attention to the small response of tribes in Panchayats (representation) and commented that the reason for the unsatisfactory response of the tribal was that "the new setup does not conform to their customs and traditions and is looked upon by them as both alien and incongruous".

The working group appointed by the Government of India to advice on the approach, strategy and priorities in respect of programs for protection and development during the 6th plan made the following important recommendations:

- (Already mentioned in 7th Andhra)*
1. Representation of the tribes in the Panchayat Raj bodies should not be less than their proportion in the population. The position of the Chairman and other important office bearers should be reserved in their favour.
 2. The traditional tribal Panchayats at the village level may be recognized as a part of the system. They should have under their jurisdiction all matters of the village including the new development functions. They may be allowed to evolve their own methods of working.
 3. In the Grama Panchayats covering a group of villages, half the members may be inducted from the traditional village Panchayat, the remaining half being elected. The functions of Grama Panchayats in tribal areas may be wider and cover some of the functions of the traditional Panchayat as well.

- Follow Us : nailedupscom** | **Facebook : nailedupscom**, **Twitter : Nailed1009**, **Instagram : nailed_upsc**
- (1) ~~Inadequate representation of tribes in the decentralized democratic setup has led to the loss of their traditional way of life.~~
 - (2) Tribes accustomed to ~~work~~ seasonal agricultural labour, now work around the year due to industrialization.
 - (6)(i) - Tribes abandoning traditional norms practices & integrating with general masses.
 - (iv) - New habits ~~drinking~~ prostitution, migration.

Anthropology Paper 02 - Volume 03

The various committees and groups have recommended obligatory reservation for tribes in the decentralized democratic setup in the context of inadequate representation of tribes and feeble articulation of their views in these bodies. Most important in this context of ill response in the development programs by the tribes emphasizes the fact that the programs should be formulated in such a way that they would not in any way obstruct or cause any inconvenience to the people it proposes to serve, keeping in view, their traditions, cultural and other important aspects what are considered as aspects of utmost importance to them.

The context of Industrialization and other development programs

~~2 points
pg - 217~~

During the last four decades and particularly during the Plan periods, there has been an acceleration of mining and manufacturing industries. Forest resources have been gradually exploited, leading eventually to deforestation, in the hilly and forested belts of tribal India. Most of these industries came to be established in or around tribal areas because they were rich in mineral and other resources. Close to these industries grew small towns housing mainly the industrial workers.

- (3)(i) As the exploitation of mineral and forest resources was chiefly confined to Assam, Bihar, Madhya Pradesh and Orissa, there was a rapid increase of urban population in these states. Demographer Bose (1962: 26) writes that with a concentration of industries in these states, there was a relative shift of urban population from Indo-Gangetic plain to the hilly and plateau areas which offered new industrial and natural resources. *(Industrial nomadism by Vidyarthi)*
- (3)(ii) Land alienation
It was not only industrialization that was responsible for the migration promoted by 'pull', 'push', or 'forced' factors of tribals from their homesteads but also other economic institutions. In certain states like Assam and of South India, tea, coffee and rubber estates were formed. The tribals were dispossessed of their land, and were made to work as plantation laborers (Jain 1988). Out-migration from Chotanagpur plateau and other neighboring regions occurred phenomenally to these estates. The tribes were forcibly migrated to other countries, like the Kol who were sent to Mauritius as laborers. Kondha of Orissa were taken to Mesopotamia to serve in World War I. A large number of Bhil were recruited for military service (Pathy 1986).

- (5)(i) Industrialization in the tribal areas offered new jobs. But the tribals, unskilled in initial stages, could only get the jobs at the lower rungs. At one time owners of land were now depressed into the class of industrial proletariat. This happened because of a number of factors. Firstly, their land had been usurped by the non-tribal Zamindars in many areas, and they were looking for some alternatives.

Secondly, installation of big industrial and developmental projects in tribal zones required the displacement of the native population, often to unknown areas (Vidyarthi 1968, Fernandes 1998). In these cases of uprooting local tribals and non-tribals were equally affected, but as the tribals outnumbered the non-tribals in these areas, they suffered the maximum. Finally, as a result of over-exploitation of forest resources by the outsiders, the tribal economics, which is to a large extent forest-based, dwindled. Thus, a combination of local impoverishment and availability of new opportunities sent these tribals to seek jobs in heavy industries, tea plantations, construction sites, etc.

- (6)(ii) These tribals now-turned laborers have changed a lot. The traditional dresses have been replaced by those that came with modernity. Their occupational structure has changed, and it has important implications. A sense of mobility is gradually instilled in the community. Mobility becomes inter-generational as the children of tribal workers aspire to do better in life than their parents, by taking hold of opportunities offered by modernity.

In this process, some of the traditional institutions weaken. For example, in his study of tribals working in Bokaro Steel Plant, Vidyarthi (1968), says that their village institutions like the 'jajmani system', the cycle of festivals and rituals, the caste-affiliations etc., have completely been disintegrated, and all round depression and despair seems to have affected the life of the uprooted villages.

(1) This, however, does not mean that there is also a subsequent decline in the feeling of oneness amongst the tribals in a new set-up. Industrialization has fostered a new sense of solidarity between the co-workers. Once there already exist ethnic and social ties between the tribals, the relations in the industry cement them further. Trade unions on the lines of tribal-workers crystallize (Bhowmik 1982). The feeling of ethnicity becomes strong and they begin exerting pressure on the state and the centre.

7.3 Ethnicity, Ethnic Conflicts and Political Developments

Concept of Ethnicity

The word ethnicity comes from the root word ethnic, which loosely means race. An ethnic community does not strictly have a racial connotation. A community can be distinct from others in many ways: their racial stock or origin being one of them. A community may distinguish itself from others by way of a particular or distinctive culture, language, religion or a combination of all these. Because of this distinctive aspect the ethnic communities often come in conflict with other communities with whom they come in contact.

Definition of Ethnicity

Cohen defines ethnicity as a process of "interaction between culture groups operating within common social contexts".

The definition of concept in any field of social science is usually difficult. And a term such as ethnicity is loaded with meanings, values and prejudices and therefore, is even more difficult to define. Ethnicity pertains to the word ethnic that is a distinction of mankind based on race. Ethnicity has now lost the original connotation. "It is now employed in a broader sense to signify self-consciousness of a group of people united, or closely related, by shared experience such as language, religious belief, common heritage, etc. While race usually denotes the attributes of a group, ethnic identity typifies creative response of a group who consider themselves marginalized in society" (Barun De and Sunanjan Das, 1992). Barth and Benedict Anderson feel that boundary is an important criterion for self-definition by ethnic group, to separate themselves from 'others'.

Social Psychology of Ethnicity

The very essence of ethnicity stems from the need to establish ethnic identity.

William Graham Sumner observed that people have their own group as the center of their lives, and rate all other groups with reference to their own. He called this tendency of individuals to cling to their clan ethnocentrism. It is a generalized prejudice.

Why do human beings slip so easily into ethnic prejudice? Human beings have a natural tendency to form generalizations, concepts and categories. Their categories are close to their first-hand experiences. They also categorize basing on hearsay, fantasy and emotions. This process of social categorization leads to the formation of an "in-group" and "out-group". All groups develop a way of living with characteristic codes and beliefs. Therefore, the formation of ethnic attitude is functionally related to becoming a group member. According to the social categorization theories given by H. Tajfel (1981) as well as J.C. Turner (1982), every social group attempts to achieve an identity in contradiction to the "out-group". Identity can be broadly characterized as the process by which an individual is bound to his/her social group and by which he/she realizes his/her social self. In the context of the Indian political identity, such a formulation has several implications. The emotional fervor associated with linguistic issues can perhaps be viewed in the context of this definition of social identity structure of the different language groups in the country.

The normative character of ethnic prejudices involve far more than the fact that members of a majority or minority group share attitudes. Each member is expected to hold such attitudes and various kinds of pressures are brought on those who fail to conform to it. A sense of identity is a very natural human tendency but when an ethnic identity is consolidated and used as a reference point for mobilization to share in the power structure, the mobilization becomes far more effective.

While ethnic attributes are categorization for the purpose of classification, which is a static formulation,



Concept of Ethnic boundary

Anthropology Paper 02 - Volume 03

(2)

Ethnicity is a dynamic process, whereby a group of people or community regroups itself as an adaptive strategy in response to specific demands of the situations. Ex:- Religion abandoned for Region, language

where there is an interplay of latent & manifest identities

Ethnicity - Perspectives

Ethnicity has given new forms and meanings with changing process such as imperialism and modernity. Consequently ethnicity has become an important field of study for social scientist. There are varieties of assumptions regarding ethnicity.

Different views

(a)

There are some scholars who see the ethnic problem in terms of assimilation and integration; wherein an ethnic group is absorbed into the mainstream group or a dominant ethnic group; an assimilation of this kind in effect is homogenization to create a nation state. To diffuse tension and to protect the dominated group it is also suggested to co-opt the marginalized group.

(b)

There are social scientists who see ethnicity as a natural bond between people, immutable or primordial (Geertz 1963). Thus they see the formation of political identity as stemming from this primordial loyalty.

(c)

There are still others who essentially see no difference between class interest and ethnic interest. They argue that ethnicity is another alternative avenue for mobility (Berge 1976), loyalty that goes in the way of mobilization.

Common view

The conception that ethnicity is culturally pre-determined with its primordial loyalties and sentiments are largely discounted among social scientists. By and large scholars agree that an ethnic group is essentially a social group when it is mobilized for collective action in pursuit of the interest of the group.

Writing on the politics of ethnicity in India and Pakistan, Hamza Alavi feels that the boundaries of ethnic categories are not 'objectively' pre-given, for whenever there is change of interest or situation, realignment has occurred as is evident from experiences. A so-called objective criterion like religion can be abandoned in favor of another like region or language. Alavi further states that the ethnic community, therefore, is not simply a politically mobilized condition of a pre-existing set of people, described as an ethnic category. The ethnic categorization itself is dependent in some way in the very emergence of the community. Experience shows that both ethnic category and ethnic community are simultaneously constituted in a single movement.

(3)

Writing about ethnicity and nation-building in Sri Lanka, Urmila Phadnis says that ethnic identity is a significant but not a sufficient requisite for evoking ethnicity. It is the mobilization and manipulation of group identity and interest by the leadership that leads to ethnicity. Ethnicity is used as an ideology and also as a device to wrest greater concessions and shares in the power structure.

(d)

Dipankar Gupta also argues that the manifestation of ethnicity in Indian politics is not so much an outcome of popular grass-root passions as it is a creation of vested political interests. He applies the notion of 'conspiracy' to ethnic politics in India to draw attention to the deliberate and calculated manner in which such politics is fashioned. He justifies his approach by asking the question as to, why from a variety of ethnic identities that abound in one society only certain ethnic dyads are politically activated and that too very selectively at certain points of time.

K.S. Singh and Sandra Wallman (1988) feel that ethnicity is being increasingly used to denote people with a distinctive set of bio-cultural and biosocial characteristics. Ethnic differences are recognition of contrast between them and us. In their opinion ethnicity is an excellent tool for identification of the aspirations of a community for delineating its boundary, and for preserving its identity. These are some perspectives or approaches to study ethnicity.



Characteristics of Ethnicity

Following are some of the characteristics of ethnicity.

1. Ethnicity relates to ascriptive identities like caste, language, religion, region etc.
2. Inequality in terms of sharing power between two ethnic groups results into conflict. Ethnicity is socially mobilized and territorially confined. It has numerically sufficient population, and is a pool of symbols depicting distinctiveness. It has a reference group in relation to which/whom a sense of relative deprivation (real or imagined) is aggregated.
- ① ✓ 3. Being left out of the developmental process or even being a victim of uneven development, ethnicity causes ethnic movements.
- ② ✓ 4. Ethnicity is manifested in Indian politics not merely due to grass root discontent but is also a creation of vested political interest.
- ③ ✓ 5. Ethnic groups that use ethnicity to make demands in the political arena for alteration in their status, in their economic well-being, etc. are engaged very often in a form of interest group politics.

Ethnic Conflicts and Political Developments

Before we try to understand the role of ethnicity and political developments, it is important to stress that whatever the difference between ethnic groups, the focus of their interaction finally boils down to the centrality of politics of who gets what, when and how? As already stated the focus of interests of an ethnic group is to get some benefits for itself. The group often uses ethnic criterion like religion, language or caste to mobilize itself to give identity to itself which separates it from other group or groups. Thus, delineation of boundary of an ethnic group or community is an important aspect of ethnicity markers. But exactly which one will get projected at a specific point of time would usually depend on where or how the person draws the boundary. Since delineation of the nature of boundary rests on the conditions existing at a given moment, the whole exercise becomes a response to the specific conditions. This adds fluidity to the situation and makes the identity projection a dynamic phenomenon. The nature of identity shifts along with changing circumstances and calls for change in boundary or a change in identification. The seeming singularity of identity, by and large, conveys a notion only. In reality, plurality of identities appears much more widespread than it ordinarily appears to be.

Manifest and Latent Identities

With plurality of identities, it is important to appreciate that all the identities of individuals or groups cannot be noticeable at a time. In fact, among various identities only one becomes manifest or apparent at a given point of time and the rest of the identities remain subsurface or latent. It may be repeated here that exactly which type of identity becomes manifest at a specific hour would depend on the nature of the immediate boundary delineation. It is, thus, through the interplay of latent and manifest identities that ethnicity expresses itself in a dynamic process. In general, whether an individual would identify himself/herself as a Hindu Rajput or a Bihari would depend, by and large on the existing conditions and felt needs of a given moment. A person ordinarily exercises his/her in order to work out what response it would be most appropriate at the given situation and acts accordingly. Thus, he/she contributes to the overall dynamics of the process.

India as we know has cultural, economic and social heterogeneity. The complex ethnic plurality of our nation is a known fact. The ethnic groups vary in size, culture, consciousness of group identity etc. and very often clear boundaries can be demarcated between group. The system on the whole is highly segmented and heterogeneous. In such a system what are the ways in which these groups have incorporated into a nation state?

Ex:- Post-Godhra killings (Hindus Vs Muslims) is an instance of ethnic violence.

① Ethnic plurality of India is a reality

Anthropology Paper 02 - Volume 03

Ethnicity Vs Nationality

There is a general notion that narrow loyalties are expression of retrogression or 'prejudice'. This originates from the concern for broader identity and lack of appreciation of the fact that plurality of identity is a reality. In fact, emergence of ethnicity all around primarily on cultural counts has put the boundary of any nation-state under severe stress. Implicitly assuming the political boundary as something very sacred, the quest for larger identity is usually emphasized. No doubt, this serves some immediate political purpose. But at the same time, this emphasis on a large identity like nation ignores the reality of plural identities and their possible interplay and thus reverts back to the nation where religion, language etc. become static categories of ethnic attributes. (2)

Geographically, Indian Sub-continent has facilitated the existence of numerous groups belonging to various racial stocks, speaking different languages and having different patterns of culture. Centuries of living together has not removed these differences. At the same time, the different groups moved in unison in the political, economic and social spheres. The different groups were united by a common historical destiny which created a psychological unity. Though diverse practices were allowed, Hinduism retained a pan-Indian quality. (4)

Language too played its role in uniting the diverse elements: Sanskrit in ancient India provided the bridge between various pluralities, while Urdu, English and Hindi sought to do the same in later times. Thus, there existed a pan-Indian culture as well as various diverse, regional, local and ethnic culture what we may call as great and little traditions respectively. (2)

Politically and administratively, India came under one umbrella under the centralized rule of Ashoka's Kalinga Empire. Later the strong centralized monarchy under the Moghals created a pan-Indian sentiment. At the same time, several political powers, small identities had emerged in India. These were like the kingdoms of Marathas in Maharashtra, Sikhs in the most of Punjab in the North-West and in Bengal in the East. These territorial identities were not always well defined. (5)

By the time of the British took over the reign of India, the change was enormous. With the British came the printing press, new system of education, new means and modes of communication and transportation and ideas of secular state, fraternity and liberty. Years of discontent with the British rule and its policies resulted in the first indigenous revolt in 1857. "The failure of the movement of 1857 to drive British out of India led to rethinking amongst educated Indians about alternative ways and means of getting rid of foreign domination. They commented that new education, science and technology had to be accepted in order to forge a new Indian national identity. If Indians could strive as a single entity, task would be easily and quickly accomplished. Thus, in the second half of the 19th century, organizations with the prefix 'Indian' began to appear" (Gopal, 1992). The growth of national feeling was facilitated by infrastructural facilities and conditions such as printing press, new means of communication and transportation, etc. as mentioned above. This growing consciousness was implicit in the growth of such pan-Indian organization like British Indian Association and later the Indian National Congress in 1885.

Indian nationalism reached maturity and became the uppermost concern, though there were occasions when ethnicity and plural identities were in conflict with nationalism. The latter, very often, appeared as integral part of Indian nationalism. Although secular ideas of nationalism were on the rise, the question of regional identities were not dead and buried, rather, they were just relegated to the background. Thus, we not only had pan-Indian organizations like Indian National Congress, there were organizations at the regional level like the Justice Party with its undertones of ethnic chauvinism in the Madras Presidency. However, "Secular nationalism, in the face of foreign rule kept ethnic and caste identities under control. It did not subdue them, but made compromises". (5)

Once the freedom was won all the subdued forces surfaced again in the independent democratic India. Political power came to be the key to economic prosperity and enhanced social status. Henceforth, conscious attempts have been made by vested interests to whip up ethnic identity and invariably all political parties have made compromises with ethnic demand. Thus, we can see that the articulation of ethnicity or ethnic movements has closely been related to the power structure, the democratic process. (6)

and initiation of socio-economic development.

Regionalism and Demand for Autonomy

(8) ✓ A careful observation will reveal that ethnic movements are generally the expressions of deprivation and disparities in sharing of privileges. The Jharkhand Movement, for example, was a movement essentially to fight the exploitation of tribes by non-tribes not only in terms of natural resources but in terms of subjugation of their culture.

The state is essentially accommodative of some of the ethnic demands. This has diffused the ethnic tension and conflicts in the country. And in some sense this enhanced the mobility and bargaining power of the ethnic group.

The post-Independent India has seen a lot of changes. We have made some new strides in development activity. Amidst this, there have emerged new classes and groups which have asserted for their separate identity and have enabled them to claim a larger share in the fruits of development. They have also realized that in a federal political structure like ours, which has a strong central state, the best way of carving out more power is to capture power at the state level.

(1) ✓ Soon after Independence the most powerful manifestation of ethnicity in India was the demand for creation of state or province on linguistic basis. The State Reorganisation Committee was formed in 1956 and boundaries of the states were redrawn on the linguistic basis. This forming of linguistic states was a manifestation of ethnic identity. This process reinforced the regional and linguistic identity and ethnicity. Thus, the demand for separate state on various accounts like ethnicity, language, etc. soon became a part of the political scenario. Various political parties were formed at the state level which were, by and large, identified with ethnic elements.

Jharkhand Movement – A Case Study

The tribal belt of Central India comprising the portion of Bihar, Madhya Pradesh, Orissa has seen the rise of the Jharkhand Movement, which agitated for the formation of a separate state for tribals and which they succeed in achieving. The Jharkhand Movement is a good example of politics of ethnicity. The movement drew its sustenance mainly from the growing discontent among tribals on account of their land alienation, exploitation and political neglect of their problems at the national level. The Jagirdari system in the 18th century turned tribals into tenants and the non-tribals exploited them shamelessly. In the wake of this development there were a series of tribal uprisings between 1789-1900 A.D. The Christian Missionaries entered the area during the middle of the 19th century. They made available for the tribals the facilities of education and helped increase employment opportunities and economic improvement. A few educated tribal Christians organized Chhota Nagpur Unnati Samaj (CNUS) in 1928 for the tribal upliftment.

✓ The turning point came when a separate province of Orissa was carved out of Bihar in 1936. The Chhota Nagpur Unnati Samaj and its new incarnation Adibasi Sabha in 1938, emerged as the dominant political party under the leadership of Jaipal Singh, a British educated tribal of the area and this party demanded, for the first time, a separate tribal province. The principal arguments given for the demands of separate state were: The area was characterized by a large concentration of the tribals. Their mental make-up, language culture and values are totally different from those of non-tribals. Also, the tribals felt that the welfare and developmental works both provided and carried out for them are pittances in comparison to the mineral wealth and forest resources exploited from the region. The tribals had a strong fear of losing their identity as they were in minority surrounded by the non-tribals. The tribals were marginalized at all levels. This had generated tremendous frustration among them. This harsh reality had provided the ground for effective propaganda that had facilitated the growth of an internal solidarity and out-group antagonism. There was an antipathy among them towards the non-tribals or Dikus. Interestingly, the definition of Dikus has changed with changing context. Originally Dikus were Zamindars and their non-tribal employees. Later non-tribals of upper castes background were identified as such. At present, the people from North Bihar are branded as Dikus.

Northeast - A Case Study

With their distinct histories, geographical location and diverse ethnic composition, almost all the states of North-East India have been beset with the problems of ethnicity. They all have witnessed insurgency, ethnic conflicts and riots and autonomy movements in varying degrees at different point of times in the post-Independence period. These movements have generally taken violent forms. Even as the elements of the insurgency are present in almost all the states of North East, it took the most strident form in Nagaland and Mizoram. There are forces in most of the states of Northeast India which believe that they are not Indians; their territories have been merged with India forcibly without their consent. They would prefer to have their own sovereign nation-states.

- ✓ The insurgent groups in Nagaland for example did not accept the Indian Constitution, its VI schedule meant for the Northeast, boycotted the first general election held in 1952 in the country, and declared to have set up their own sovereign state in exile - the Federal Republic of Nagaland. Over a period of time, new insurgent groups have emerged in almost all states of the region. Supported by the foreign countries, especially the neighbors, these have setup an umbrella organization under the leadership of the NSCN (National Socialist Council of Nagaland). They question the sovereignty of the Indian state and the concept of the nation-state. The areas of Assam that are inhabited by the Khasis, Jaintias and Garos had witnessed the movement for an autonomous state in the 1960s. It resulted in the formation of a separate state of Meghalaya in 1972. In Assam, there are agitations for the creation of the autonomous states like Bodoland and Karbi Anglong, etc. The target in the insurgency is the sovereignty of the state - police, army and other institutions; the autonomy movements do not just question the sovereignty of the state, but their attack is also diverted against the state agencies. The insurgency and the autonomy movements often result in ethnic riots, especially between the tribals and non-tribals or between one and the other tribe. All these developments ultimately get linked to the state policies regarding the Northeast region.
- ✓ There are mainly two perspectives that analyze the issue of ethnicity and nation building in the context of the North-East India. The first is the modernization/development/"nation-state building" perspective. The second is the "federation-building" perspective. The former views the problems as the outcome of the following: the process of "nation-building" in the face of the conflict between the modern and tradition; the process of modernization and transition (democratization); conflict between the modern and traditional leadership; and the inability of the system to fulfill the aspirations of the new generation. The scholars who have used this perspective are S K Chaube, V B Singh, B G Verghese and Myron Wiener.

- ✓ The second perspective is basically a critique of the first one. This perspective is available largely in the writings of the scholars who hail from the Northeastern region. The prominent representatives of this perspective are Sanjib Baruah, Sajal Nag, Udayan Sharma, Hiren Guhain, Sanjay Hazarika and M P Bezbarua. In fact, Urmila Phadnis is of the opinion that the main leadership in the entire South Asia followed the notion of nationhood as per the considerations of the dominant groups and ignored the minority constituents of the society. The scholars who adhere to this perspective argue that the problems in the Northeast are the result of the "nation-state building" perspective of the mainstream national level leadership. They further argue that in their quest of the "nation-state building" the dominant groups of the country represented by the central government and the mainstream leadership ignored the "periphery", the smaller nationalities of the North-East; have acted as a "step mother" to them; shown arrogant attitude; paid less attention to the human rights violation in the North-East than other parts of the country. These factors have resulted in the insurgency problem in the Northeast. This perspective is well articulated in the suggestion of Sanjib Baruah that the mainstream leadership of the country should replace their "nation-state building" approach in favor of "genuine federation-building" in order to retrieve the situation.

Response of the State

The Indian constitution has recognized the ethnic diversities and ensured that these diversities may not be obliterated. At the same time, the constitution has also felt that ethnicity should not stand in the way of political, social, economic and cultural progress of people in the country. Provisions such as universal

adult franchise granted to the people irrespective of their caste, race, language etc. granted to the people secular participation in various social and economic activities. The state has also turned to be reformist and has intervened to promote the lot of weaker sections and minorities.

"The most important of such demands came from religion and linguistic groups the resultant fear of dismemberment of the nation, appears to have made such demands totally unacceptable to the government. Whereas, demand for linguistic reorganization of the State have been considered despite initial reluctance. Further, a policy of accommodation is clearly visible on the official, language issue. Brass (1978) lists down four rules that regulate the attitude of government towards ethnic demands.

1. All demands short of secession will be allowed full expression, but secessionist demand will be suppressed, if necessary, by armed forces.
2. Regional demands based on language and culture will be accommodated but those demands based on religious differences will not be accepted.
3. An ethnic demand will be accepted only when it achieves broad popular support in the region.
4. The views of other groups involved in the dispute are essential for problem solving.

Tribalism and Pseudo-Tribalism *(More needed) (go to page - 1)*

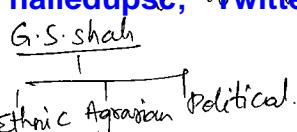
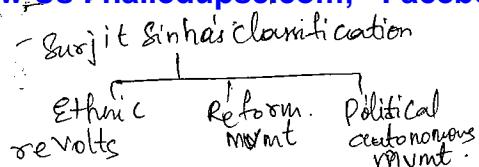
① The word "tribalism" frequently refers to the possession of a strong cultural or ethnic identity that separates oneself as a member of one group from the members of another. (Refer William Graham Sumner's concept of In-Groups and Out-Groups). This phenomenon is related to the concept of tribal society in that it is a precondition for members of a tribe to possess a strong feeling of identity for a true tribal society to form.

While ethnocentrism is one of only a very small handful of human cultural universals, the term "tribalism" has become nearly synonymous with it. Many tribes refer to themselves with their language's word for "people," while referring to other, neighboring tribes with various epithets. For example, the term "Inuit" translates as "people," but they were known to the Ojibwe by a name translating roughly as "eaters of raw meat." This fact is often cited as evidence that tribal peoples saw only the members of their own tribe as "people," and denigrated all others as something less. In fact, this is a tenuous conclusion to draw from the evidence. Many languages refined their identification as "the true people," or "the real people," suggesting that there were other people, who were simply inferior. In this is an evidence of ethnocentrism, a universal cultural characteristic found in all societies.

② Tribalism has a very adaptive effect in human evolution. Humans are social animals, and ill-equipped to live on their own. Tribalism and ethnocentrism help to keep individuals committed to the group, even when personal relations may fray. This keeps individuals from wandering off. Thus, ethnocentric individuals would have a higher survival rate -- or at least, with their higher commitment to the group, more opportunities to breed. A more significant vector may be that groups with a strong sense of unity and identity can benefit from kin selection behaviour such as common property and shared resources.

"Pseudotribalism" is the word that connotes a false sense of "tribalism". Even though a sense of strong ethnocentrism prevails amongst them, most of the ethno-political movements are organized 'multi-tribal' activities which are politically motivated. Jharkhand movement is a case in point. The nature of tribal movements reveals the fact that the concept of 'tribalism' is not as strong as it was, once upon a time. The basis of tribal movements is not common interests among the members of the movement, but conflicting interests with other dominating groups. The basis of group loyalty is not common cultural consciousness but a common economic and political agenda. (More on this in the topic on ethno-political movement).

Thus, Pseudo-tribalism has a force is responsible for atleast a temporary suspension of differences between different tribes, mobilizing people based on economic and political agenda and creating a sense of "solidarity" amongst different tribal groups, at least temporarily.



Unrest Among Tribal Communities

✓ Tribe is a colonial concept, introduced in the 19th century, by colonial authorities and ethnographers to describe all communities of India. In the latter half of the same century, the concept of tribe was narrowed down to the primitive groups as distinct from castes. It was under the Government of India Act of 1935 and the Constitution of India that the nomenclature of the Scheduled Tribe fully emerged. The Constitution of India does not define a tribe. The notion of the Scheduled Tribe has two aspects. It is administratively determined *inter alia* by the criteria of backwardness and remoteness – people living in forests and on hills. They are also called *adivasis* – the natives. The tribals like many other social groups have launched social and political movements for the redressal of their grievances. Most of the regions except the Southern pockets, the North-western region and the islands have witnessed several agitations of the tribals during the colonial and post-colonial periods. During the pre-colonial period tribals rose against the regional power of the Marathas or Rajputs. They resisted against the zamindars and non-tribal administrators. During the colonial period they struggled against the British rule for their autonomy. Birsa Munda revolt in Central India is best-known example of this. There were also politico-religious movements resisting against the non-tribal cultural authority through religious ideas.

✓ Tribe in India today ~~do not~~ subsists on a single techno-economy of production. Most of them subsist on a combination of five modes or even more, of subsistence. The primitive technology, namely, hunting, food gathering and shifting and terrace cultivation is confined to the heavy monsoon zone covered by the tropical forests in the north-east, parts of eastern and central regions, the Nilgiris and the Andaman Islands. Pastoral economy, which constitutes about 10 per cent of the tribal economy, survives in the high altitude of the sub-Himalayan regions, the arid zones of Gujarat and Rajasthan, and in a small pocket in the Nilgiris. More than three quarter of tribal workers are engaged in the primary sector of economy, of which a majority are cultivators followed by agricultural laborers. A large number of them are engaged in livestock, forestry, fishing, hunting etc., and as workers in construction sector, mining and quarrying. Though barter is reported among tribal communities on a significant scale compared to the non-tribals, almost the entire tribal economy today is in the vortex of market forces. There has been a marked shift among the tribal communities from the traditional to the new occupations. For instance, a number of communities practicing hunting and gathering has declined as forests have disappeared and wildlife has diminished.

Ecological degradation has severely curtailed the related traditional occupations of the tribal communities. However, there is a rise in horticulture, terrace cultivation, settled cultivation, animal husbandry, sericulture and bee keeping. The tribes are moving away from their traditional occupations and settling down as peasants and that they have taken up new vocations to augment their income and raise productivity. We also find evidence of diversification in the tribal economy. There is a sharp rise in the number of tribals employed in government and private services, self-employment, etc. Many of the traditional crafts have disappeared and spinning, in particular, have suffered. Related activities such as weaving, dyeing and printing have similarly suffered. Skin and hide work, etc. have undergone changes; stone carving has declined. But the number of tribals employed in mining and masonry has gone up steeply which suggests a new mobility. The tribals are also craftsmen. Carving and body tattooing consist of the forms of arts and crafts prevailing among the tribal people. Wall painting and drawing have emerged as other major forms of art in recent years. In fact there has been a significant revival of these forms of art on a commercial scale among the Warlis, Rabaris, Rathawas and others. Basketry involves the largest number of tribes, followed by those engaged in weaving, embroidery and pottery.

The impact of development processes, particularly education, has created a new stratum of entrepreneurs/businessmen, teachers, administrators, engineers/doctors and members of defense services among the tribals. Development process has also created division in tribal society. Disparities have increased. With the loss of control over resources and growth of population, demographic growth rate has been higher among tribes than the national average, poverty among the tribals has also increased manifold. Barring a few tribes or a few sections among them, the tribals remain among the most backward and poorest sections of our populations.

①

PRE-COLONIAL MOVEMENTS

In the pre-colonial period some of the tribes founded states in the territories extending from the northeast, through middle India to western and southern India. Where they did not found states, they were accommodated within regional political system, retaining a great deal of autonomy and freedom. Elsewhere the tribes were reported to be in disturbed conditions on the eve of the colonial role. For example, in western India the tribes such as Gonds, ^{Villagers} Kolis were reportedly in a disturbed state.

The tribals often rose against regional powers such as the Marathas, Rajputs etc. The Mughals had put down the Kolis and the Marathas had dealt with the Bhils and Gonds, with a heavy hand. All this radically changed during the colonial period that witnessed the first major assault on tribal autonomy and tribal's control over their resources such as land, forest, minerals, etc. Colonialism also witnessed the dismantling of pre-colonial political structures built up by the tribals or those that accommodated them. Therefore, tribals rebelled more often and organized movements and protests on a larger scale than any other community during the colonial period.

The First Phase (1795-1860)

K.S.Singh's classification

The rise and establishment of the British rule saw the beginning of the first phase (1795-1860) of the tribal uprisings that may be described as primary resistance movements. The Santhal insurrection (1855-

(A) 1856) represented a transitional phase marked by the agrarian resistance and revivalism. In the Northeast the sub-phases of tribal rebellions could be similarly demarcated. The Garos and Hajongs who submitted to the British rule to escape the tyranny of their zamindars, came under the influence of the Pagal Panthi. Their chief, Tipu who became the leader of the oppressed peasantry, founded a kingdom and was arrested. The Khasis were engaged in acts of depredations in the plains they raided from 1787 to 1825. The Singphos, Mishmis, Lushais, Khamptis and Daflas raided plains and killed people. The Khasis opposed the construction of the road, and the confederation of Khasi chiefs resisted the British attempt at the occupation of their country led by Tirot Singh. The British sent out expeditions to punish the Lusahis, Mishmis etc. In middle India, this phase ended with the revolt of Maniram Dewan and Saranga Raja of Assam in 1857.

The Second Phase (1860-1920)

(B) The second phase (1860-1920) coincided with the onset of the intensive period of colonialism, which saw a much deeper penetration of merchant capital, a higher incidence of rent, etc., into tribal and peasant economies. It intensified the exploitation of the tribes. As a result of this, there were not only a larger number of movements, represented by such evocative native terms as *mulkui larai*, *fituri*, *meli*, *ulgulan* and *bhumakal*, involving many tribes but also a far more complex type of movement, which represented a curious mix of agrarian, religious and political issues. The Bhakti movement, with its tenets of monotheism, vegetarianism, cleanliness, abstention from liquor, etc., was introduced by mendicants (gossains), artisans and peasants moving into tribal areas. Christianity also arrived and under its impact a new tribal middle classes emerged, which was educated, conscious and self-respecting. Both Christianity and

(C) Christianity
(D) Bhakti movement contributed in this phase to the rise of millenarian movements. The tribal movements demonstrated, in varying degrees, tribal resistance against the assaults on their system and their attempt to prop up its moldering edifices. They were followed by the socio-religious or revitalization movements, viz, the Kherwar movement among the Santals (1871-80), the Sardar revivalist movement among the Mundas and Oraons (1881-90), the Tana bhagat and Haribaba movements in Chotanagpur, the bhagat movement in Madhya Pradesh and Bhil revivalism, which were expressive of the tribals urge to create a new order. These two lines of the movement, through the length and breadth of the sub-continent, revealed striking similarities and a basic unity of response to almost the same complex of challenging forces.

(E) The movement led by Birsa Munda (1874-1901) is the best known of the socio-political movements of this phase because the movement sought to establish Munda raj and independence. In its socio-religious aspects, it was like any other bhagat movement, with the difference that it was also influenced by

which phase does Naga's rebellion come into?

Christianity, and it used both Hindu and Christian idioms to create the Munda ideology and worldview. The rebels attacked police stations and officials, churches and missionaries. Though there was an undercurrent of hostility against the dikus (outsiders), there was no overt attack on them except in a couple of controversial cases. The uprising was quelled, but its lessons were acknowledged in the passing of the Chotanagpur tenancy act. It sought to protect the Munda land system, prohibit transfer of tribal land, recognise tribal right to reclaim land and create a new administrative unit. Their revolt forced the Mewar durbar to sign a 21-point agreement.

The Third Phase (1920-1947)

Non-cooperation impact

Alluri Sitaramayya revolt

In the third phase from 1920 to 1947 we see three trends in tribal movements. The first trend is the impact of the freedom struggle led by Mahatma Gandhi who mobilized some of the major tribal groups in the national movement and reconstruction program. The movements centering on land and forest and revival and reform of tribal society represent the second trend. The third trend is reflected by the rise of movements seeking autonomy, statehood, separation and independence led by the tribal middle class.

We may describe in brief three movements, the Tanabhagat movement among the Oraons, the Haribaba movement among the Hos and allied tribes, and the Rajmohint movement among the Gonds. To the Hindu peasantry steeped in the medieval bhakti tradition, the Mahatma appeared like a bhakti preacher, and to the tribals like a bhagat.

The best known of bhagat movements was the Tanabhagat movement that started in the manner of a nativistic movement. While the tribes accepted the nationalist program and joined the mainstream of the national movement, they resisted against their economic and cultural exploitation. Swaraj meant not only freedom from British rule, but also freedom from the oppression of the dikus, moneylenders, zamindars and feudal overlords. In the princely states where tribals were more backward, the Praja Mandals launched movements against the feudal order by mobilizing the tribals. The tribes who responded particularly to these movements were the Bhils, Gonds, Kharwars, Mundas and Khonds. Most of them had a notion of property, private or communal, in land, which had been threatened by the colonial system and feudal exploitation. The agrarian issues, which excited them, were the demands for begar or veth (compulsory labor without payment) rasal or magan (free supply of provisions for visiting officers), and exactions other than rent (abwabs).

Two nativistic movements sought to revive the pure and pristine elements of tribal culture. The Seng Khasi, a socio-cultural organization of the Khasis had been established as early as 1889 to preserve the Khasi way of life. Through its platform the non-Christian Khasis have tried to strengthen the ancient system of clan relationship, which was disturbed by the large-scale conversion of the Khasis to Christianity. The second - the Zeliangrong movement - started as a religio-cultural movement under Jadunang. It assumed a political overtone and became the only movement to have established linkages with the national freedom struggle. Under Gaidinliu, it remained strongly nationalistic, promoted tribal solidarity and demanded creation of a separate administrative unit for the Zeliangrong people to be formed out of the territories inhabited by the constituent tribes in the contiguous regions of Manipur, Assam and Nagaland, to which these states did not agree.

(3) POST-COLONIAL MOVEMENTS

The post-colonial period witnessed intensification of the exploitation of resources of the land of the tribals and their marginalization and pauperization, despite progress in education and employment, representation in politics and share in power, and affluence of a section of tribal middle class. Therefore, this period witnessed the rise of a larger number of movements centered on the issues of identity, equality, empowerment, self-rule, etc. Tribal movements may broadly be classified into:

1. Political Movements: Movements for autonomy, independence, state formation, and self-rule.

2. **Agrarian and Forest-based Movements:** Movements for control over resources, such as land and forest or the movements directed against land alienation, and displacement and against restrictions in forest and for forest conservation.

POLITICAL MOVEMENTS

There have been attempts at articulation of the aspirations for political autonomy among the Gonds and Bhils during the period that followed independence. The Raj Gond leaders such as Raja Naresh Singh demanded the formation of a separate state for the adivasis to be carved out of the tribal areas of Chattisgarh and contiguous districts of Rewa region and Vidarbha, in a memorandum submitted before the States Reorganization Commission. On 19 May 1963 Narain Singh Ukey, President of the Gondwana Adivasi Seva Mandal reiterated the demand for the formation of the Gondwana state, consisting of the Gond and other tribal regions of the Chattisgarh and contiguous districts of Vidarbha in Maharashtra.

It was in Chotanagpur - Santal Pargana region of Bihar that the movement for political autonomy and formation of a state really developed further. The Adivasi Mahasabha was wound up and merged with a new regional party, the Jharkhand Party, in 1949. Behind it were the experiences of the failure of the militant movements and of the framing of the Constitution of India. The Jharkhand Party was thrown open, at least, in principle, to all residents Chotanagpur. There was thus a transition from ethnicity to regionalism as the formative factor in the movement. The period from 1952 to 1957 was in many ways the peak period for the Jharkhand movement and party, which had emerged as the major party in the Chotanagpur-Santal Paragana region. The second general elections in 1957 had seen it extend its influence to Orissa, where it captured five seats and held the balance of power in the state politics that was plagued by instability. It displayed remarkable unity, laid down the law in the tribal region, could mobilize thousands of people and take out mammoth processions at short notice. The decline of the party began in the early 1960s. The reasons for its decline were the following: involvement of the tribals in the process of development; rivalry between the advanced Christian tribals and backward non-Christian tribals arising out of competition on education, employment and control on the resources for development; and, shift in the support of the non-Christian tribals from Jharkhand to the Congress and Jana Sangh. The Jharkhand Mukti Morcha emerged as a major political force in the industrial and mining belt of Chotanagpur and in state politics after the 1980 general elections. It sought to broad base the separatist movement by including within its ambit the peasant and working classes. The Jharkhand is described by its ideologues as an internal colony that is being exploited by outsiders. Even though the region accounts for 28 percent of minerals, it avails itself of only 15 percent of the state's budget for development. The development process itself is exploitative of the local inhabitants and outsiders have moved in to seize all opportunities of employment. Through many vicissitudes that affected Jharkhand movement, the groundswell of support for a separate state continued and even intensified, bringing within its sweep major political parties. They started by setting up the regional structures in the 1980s. The then Prime Minister Indira Gandhi declared in 1980 that Chhotanagpur was a culturally distinct area. This was translated into an autonomous political authority in the early 1990s. In 1988, Bhartiya Janata Party committed itself to the formation of Vananchal State in terms of regional backwardness. Thus the two important players who were long opposed to Jharkhand reversed their roles. All Left parties barring the CPI (M) supported the demand for a separate state in 1980s while highlighting land and forest issues, nationality, class and ethnic question, generally ignored by major parties. Thus while on the one side, the Jharkhand State was steadily growing and this was translated into electoral gains for the pro-state parties, particularly the BJP in the 1990s. The Committee on Jharkhand Matters recommended setting up of an autonomous authority. The Jharkhand Area Autonomous Council (JAAC) came into existence in 1993, but it fell short of the expectations of the people who demanded nothing short of a full state. In the two general elections held in 1995 and 1996 the all India parties advocating a separate state swept the polls. Jharkhand state became a reality on 15 November 2000, substantially fulfilling the objective of a Jharkhand state set by the Jharkhand Party in 1950 and dream of a tribal raj held out by Birsa Munda, about one hundred year ago.

Political Movements in the Northeast

Tribal movements in the Northeast stand in a category by themselves because of the region's unique geopolitical situation and historical background. Political processes in the North-Eastern hills picked up on the eve of transfer of power when a considerable number of tribals and a substantial section of their elite among the Khasis, Mizos, Garos and even a section among the Nagas agreed to participate in the constitutional system of India. Old tribes assumed new names, small tribes merged with larger tribes, and the tribes combined to form a new ethnic-cum-territorial identity. While the processes up to the formation of the autonomous councils or the state were almost common to all tribes, there were differences on the question of their relationship with the nation-state. A section of the Nagas chose the path of insurgency, followed by the Mizos, the Meiteis, and the Tripuris. Other sections of the same tribes later preferred integration. For example, in Nagaland the Angami, the Ao and the Sema who had played the major role in the beginning of Naga insurgency opted for sedate regional politics. The centre of gravity shifted from the area dominated by these tribes to the areas inhabited by the Konyak and Lotha and now to the international border. The Hemis, and the Konyaks and Tangkhuls now dominate the insurgency. In fact there has been a reaction among these minor tribes against the domination by the Hemis, and the Konyaks and Tangkhuls. There is also a demand for the formation of the remote and underdeveloped Mon and Tuensang districts into a union territory.

The Naga Movement

(3) The Naga movement is the oldest ongoing movement for autonomy or independence. The origin of the present Naga movement could be traced to the formation of a Naga club in the year 1918 at Kohima with a branch at Mokokchung, which consisted mainly of the members of emerging Naga elites, including government officials who came from the administrative centers of Kohima and Mokokchung educated in Christian educational institutions, and a few leading headmen of the neighboring villages. The club discussed social and administrative problems involving all the tribes of the Naga Hills. The Naga Club submitted memorandum to the Simon Commission in 1929. It prayed for keeping the hills outside the scheme of reforms and for continuing the direct British administration of the hills. In April 1945 the District Tribal Council, which united the individual tribal councils, was formed in the Naga Hills at the initiative of the then Deputy Commissioner of the Naga Hills District. The nomenclature of this Council was changed to Naga National Council (NNC) in 1946. The Japanese fought their last battle during World War II at Kohima, the headquarters of the Naga Hills District. The constitution of the Naga National Council as the political forum of the Naga tribes could be considered the beginning of the modern phase of the Naga movement. It gave a sense of political unity to the Naga tribes and it had embodied the concept of Naga nationhood.

In 1946, the British Government proposed a scheme to carve out a Trust Territory comprising the Naga Hills, the then NEFA area and a part of Burma, as a 'Crown Colony' under control from London. The educated Nagas in the NNC quickly opposed this idea of British colonisation, like the Indian National Congress, and declared that the British must quit Naga Hills when they quit India. The objectives of the NNC have developed through many phases from autonomy to independence. Under the 9-point agreement reached between the NNC and the Government of India — represented by the late Sir Akbar Hyderi, the then Governor of Assam on 27-29 June 1947, there were provisions for protection from land alienation, creation of administrative autonomy and a special responsibility of the Government of India for their implementation.

(e) The Naga movement from 1947 to 1954 in the Naga Hills remained peaceful and constitutional. Towards the end of 1949, the Naga National Council changed its goals favoring Independence outside India Union. In 1954, the Naga announced the formation of the Hongkin Government that is the 'People's Sovereign Republic of Free Nagaland'. Violence broke out in 1954 and there were many incidents involving the Indian army and rebels. In July 1960, a 16-point agreement was reached between Prime Minister Pandit Jawaharlal Nehru and a Naga delegation. On 1 August 1960, Prime Minister Nehru announced in Parliament the decision of the Government to make 'Nagaland' the 16th state of the Indian Union. By this time a new group of Naga leaders had emerged in Nagaland, who formed the Nagaland Nationalist

Organization (NNO). Mainly those leaders who had been instrumental in bringing about statehood for Nagaland formed the NNO. In the same way, there emerged the Democratic Party of Nagaland, which was formed by those who differed from the NNO leadership and harbored sympathy for the secessionist underground group. However, the militant section of the Naga movement remained underground for more than a decade between 1954 and 1964. Till 1968, several rounds of talks were held between the underground leaders. Another landmark was the signing of the Shillong Accord, on 11 November 1975 under the terms of which the underground Naga accepted the Indian Constitution, the deposited their arms and government of India in turn released Naga political prisoners and promised their rehabilitation. However, while there has been no resumption of insurgency and more and more underground leaders have come over ground, renouncing violence. Nagaland has generally remained an oasis of peace and stability in the troubled northeast; Phizo himself and the hostiles have repudiated the Accord. The hostiles stood divided into three camps (i) the pro-Phizo Federal Party, (ii) the group led by Mown Angami who became Vice-President of the underground Naga national Council and who condemned the Federal party of its reconciliation with New Delhi and denounced the insurgents for betraying Christianity and (iii) the insurgents imbued with Moists ideology led by a Tangkhul Naga, T. Muivah and Isak Swu who have established the National Socialist Council of Nagaland (NSCN). There were incidence of shootouts, cross fire, murderous attacks, and indeterminate killings between pro-Phizo and Muivah-Isak factions on the Indo-Burma borders.

Behind the permutations and combination of Naga politics one sees the changing equations among various tribes. The Angami, Ao and Sema who played the major role in the beginning of Naga insurgency have opted for sedate regional politics. The centre of gravity has shifted from the area dominated by these tribes and by the Konyak and Lotha to the international border. The insurgency is now dominated by the Hemis, and the Konyaks and Tanghuls loyal to pro-Phizo party have been killing the Angami, Khomengan and Chakesang. In fact there has been a reaction among these tribes against the dominance of the advanced tribes such as the Ao, Angami, Chakesang and Lotha.

Meanwhile, the Nagaland politics have moved between the mainstream and regional poles. The Nagaland National Organization ran the government from 1964 to 1975. In 1976 it merged with the Indian National Congress to gain a national identity. The Nagas in the mean time have emerged as the most dynamic and progressive people in the northeast who developed village development boards as the catalysts of rural development and also raised a Naga regiment that fought at Kargil. And yet, the final solution to the Naga problem is not yet in sight, though negotiations often take place between the government of India and insurgent group to find a solution.

AGRARIAN AND FOREST-BASED MOVEMENTS

In the post-colonial era the pattern of alienation of tribal resources such as land shows a marked change. Tribals are being displaced not only by non-tribals but also by the state and other organizations that require land for development. They are now pitted not only against other people but also against the state that they see as the major instrument for displacing them from their land.

The tribals are asking not only for restoration of the land that they lost by invoking the provision of the Andhra Pradesh Scheduled Area Land Transfer Regulations, 1959, which came into force in 1963, but also the transfer of ownership and delivery of possession in regard to the land allotted to them. Of late, CPI (ML) of the People's War Group (PWG) has organized them. In February 1981 there was an unusual spurt of forced harvesting on lands taken away from them by non-tribals, raiding of houses of moneylenders and decamping with mortgaged valuables. The traditional system of communication was revived to organize the tribals. Signals were exchanged by beating the drum. The Gond durbar held on 6 February 1981 at Keslapur declared that the problems of the tribals had come to a boiling point. The Gonds also prevented the demarcation of land for afforestation. They had earlier reacted strongly to the scheduling of the Lumbadars, a community of traders and moneylenders, as a tribe in 1977, because the Lumbadars always exploited the tribals and their status as a tribe helped them to legitimize their illegal possession of the Gonds' land. On 20 April 1981 a conference was planned by CPI(ML) at Indervalli. The meeting was banned and the tribals were persuaded not to assemble there. However, they took out a procession that

Gonds
(VS)
Lumbadars

came into conflict with a police force. About 15 tribals lost their lives.

Characteristics of Tribal Revolts

The leadership of the tribal movements has mainly emerged from themselves. While the leadership of the first phase emerged from the upper crust of tribal society, that of the second rose from the lowest rung of it. The Santal brothers were landless - Birsa Munda was a ryot or a parja (crop-sharer) and Govind Giri was a hali. The leadership of the third phase and post-colonial periods was provided by the members of the upcoming tribal middle class, both in middle India and in the Northeast. They were educated people who included priests, catechists, teachers, public servants, rural leaders and professionals who spoke largely in secular idioms. The leadership for social reform movements was provided by the outsiders such as the Gandhian workers, of the Pochampally Mandal agitation by outsiders like Motilal Tejawat and of some tribal uprisings such as the Nagesia by even "Baniyas".

✓ The goals of the movement ranged from the restoration of the pre-colonial polity, service tenure (Chuan), and land (Sardar) and right in forest to expulsion of outsiders, end of taxation, social reform, political independence, or establishment of the tribal raj or participation in constitutional and democratic political apparatus, formation of tribal states, gaining equality and end of exploitation.

✓ The social and ethnic composition of the movements ranged from the movement led by a single tribe to a confederacy of tribes and the castes sub-ordinate to the tribes such as the artisans and service groups. Most of the movements were limited to a tribe but such movements in the first phase such as Kol and Santhal insurrections encompassed many tribal and non-tribal groups. In the third and post-colonial period broad based political parties emerged among the tribes, both in North-East and in middle India.

✓ The all India tribal platforms gradually emerged in 1960s.

All tribal movements were limited in scale but they had an immediate impact on policy of the state. In the short run the authorities responded by taking immediate measures to address the tribal concerns, divisive measures to protect their resources, facilitate access to the officials etc. In the long term the colonial policy built up a framework to institutionalize the isolation for tribals, a combination of elements of direct and indirect rule in princely states, in the North-East etc., a mix of legal and administrative measures to protect land against alienation to non-tribals, and protect customary rights in forest. There was, however, to be no development of any kind – the missionaries were left free to manage education and health services. It was left to the Gandhian workers and Congress ministries which assumed office in late 1930s to institute inquiries into tribals' poverty, indebtedness and backwardness and put in place the first slew of welfare measures.

The results of the uprisings were thus not uniform for whole of tribal India. While in British India they achieved a non-regulation administrative system for tribes and special agrarian laws to protect tribal land, little was done for them in princely states. However, the political agent did intervene to uphold status quo rather than promote change. This ambivalence was typical of the colonial system.

Summary of Important Reasons for Tribal Unrest (CARDS & La Ops) (Post Independence)

Inadequate Implementation of Constitutional Safeguards: The Constitution envisages a comprehensive and well-designed scheme of action for tribal protection and development. The Governor of a State having Scheduled Areas has been given regulation-making power for development of Scheduled Tribes and good administration of Scheduled Areas in consultation with the Tribes Advisory Council. He is required to keep the President informed of the tribal situation in the State by submitting annual report. In order to protect the tribal interest, the Governor has been given power to exclude the application of any law or part thereof made by the Parliament or the State Legislature. These vast powers vested in the Governor by the Fifth Schedule are limited by Article 163 which says that the Governor will be aided and advised by the Council of Ministers in the exercise of his powers. According to judicial opinion, the Governor is bound by the advice of the Council of Ministers in the exercise of powers granted to him under the Fifth Schedule. Thus, it is the responsibility of the State Government to make effective use of the provisions in the Fifth Schedule.

The Union Executive has been vested with vast powers of giving directions under Para 3 of the Fifth Schedule and Article 339(2) for preparation and execution of schemes of tribal development and for good administration of Scheduled Areas. Financial provision has been made under first proviso to Article 275(1) to meet the cost of such schemes out of the Consolidated Fund of India. So far no directive has been issued by the Union Government to any of the State Governments. The Union Government's persuasive approach with the State Governments regarding the measures to be taken for the protection and development of the tribes has not been very effective. The provisions contained in the Fifth Schedule have virtually remained non-operational. Land continues to pass out of the tribes to non-tribes. Money-lenders continue to exploit them by charging exorbitant rates of interest. Prescribed minimum wages are yet to be enforced in tribal areas. Condition of migrant tribal labour particularly women continues to be vulnerable.

- (b) The Special Central Assistance is released to the State Governments in a ritual way without any area-specific or people-specific schemes. In fact, it is critical gap filler in the planned efforts of State Governments and should be utilised for schemes which are undertaken by the State Governments with the prior approval of the Union Government.
- (d) The Tribal Sub-Plan strategy launched in 17 States and 2 Union Territories since the Fifth Five Year Plan as a new "package deal" for integrated development of tribal areas with specific focus on development of tribal communities has not been a success because of lack of orientation of the administrative machinery.

The economic assistance given to family oriented programs is inadequate to lift a family above poverty line. No scientific data has been collected about the extent of impact of the programs.

- (e) In recruitment of services and posts under the government of India and the States, the Scheduled tribes are still under represented. Their representation in Central Government posts and services is below 2% in Group 'A' and 'B' and below 5% in Group C & D, as against 7 1/2% prescribed for each of these categories.

In the wake of development process, there has been heavy influx of outsiders in the tribal areas who have not only grabbed most of the resulting job opportunities but also settled down in those areas and have increased pressure among others, on the land resources. The power of imposing restrictions on the movement or settlement of outsiders in tribal areas as envisaged in Clause 5 of Article 19 of the Constitution has never been exercised. As a result, the tribal population in certain tribal majority areas has been reduced to minority. This trend is conspicuous in industrial areas where the tribes face a serious challenge to their existence in general and to their culture in particular.

- (2) **Denial of Participating in Development Process:** There has been no effective participation of the tribes in decision making and developmental process affecting them and administration of their own affairs. The policies and programs have been formulated without consulting them. It has resulted in fixation of wrong priorities and failure in achieving the desired results. This is one of the important causes of the discontentment among tribes. Participation of tribes in both formulation and implementation of policies and programs affecting them is imperative to ensure that interests of these people are properly safeguarded.

- b) Various consultative agencies in the states with a large number of tribal representatives on them such as State Legislature Committees, District and Project Level Committees, Tribes Advisory Councils in all the eight states with Scheduled Areas and two non-Scheduled Area states of West Bengal and Tamil Nadu are not very effective.

Effective participation of the tribes in their affairs may be brought about by (1) instituting procedures to ensure regular consultation between the Government agency and the representatives of the tribes, (2) supervising the activities of the Government agency by a consultative body comprising elected / nominated representatives of the tribes, (3) inducting the tribes as officials at various levels of the Government, (4) setting up of bodies with elected/nominated tribal representatives within legislative and executive branches of the Government with guaranteed participation in development process and

examination of issues which affect their interests and (5) guaranteed representation in Panchayat Raj institutions in proportion to tribal population.

The introduction of elective Panchayat Raj system in the tribal areas has replaced the traditional tribal institutions and it has generally resulted in annexing the positions of power by influential and powerful non-tribes. The law establishing the Panchayat Raj institutions generally provide for unit area representation on population basis like wards / villages at the base. The expectation that this mode would ensure satisfactory tribal representation in the Panchayats in tribal majority areas is blind in the absence of specific legislative stipulation in most of the States that only tribal candidates must be fielded. There is also no provision that Panchayat Raj bodies in tribal majority areas should be headed by the tribes at all levels.

Nominated bodies including Regional Autonomous Development Authorities, Project Implementation / Advisory Committees are also handicapped by the absence of statutory reservation in favour of the tribes. For instance, in Bihar, 3 Regional Autonomous Development Authorities, namely (i) North Chotanagpur, (ii) South Chotanagpur and (iii) Santhal Parganas Autonomous Development Authorities have been established by law for ensuring effective implementation of programs in tribal areas. The Act which set up the Regional Autonomous Development Authorities does not stipulate that the Chairmen or Vice Chairmen or majority members of these bodies shall be nominated from among the Scheduled Tribes. As a result, key positions in many of the nominated bodies and elected bodies under Panchayat Raj namely, Zilla Parishad, Panchayat Samiti, Taluka Mandal, Gram Panchayat are captured by the influential non-tribes.

Some of the states have amended their laws to provide for reservation in favour of Scheduled Tribes both in the Panchayat Raj Institutions and nominated bodies. In Andhra Pradesh, six percent of the total number of the offices of Presidents of Mandal Parishads, Chairmen of Zilla Praja Parishads have been reserved for Scheduled Tribes. This is in proportion to their population in the state.

The co-operative laws/bye-laws should be amended and if necessary, new laws should be enacted to ensure fair representation and effective participation of the Scheduled Tribes on the Board of Management of co-operatives, particularly in the Tribal Sub-Plan Areas.

(3)

Lack of Accountability: Absence of any specific provision of legislation regarding the administration of the affairs of the Scheduled Tribes in the Constitution is one of the major shortcomings. The legislative powers of the Parliament and State legislatures are defined under Articles 245, 246 and 248. None of the three lists i.e., the Union list, State list and Concurrent list includes in it the tribal affairs exclusively. Therefore, the State legislature has no power to make any laws in respect of tribes. Only the Parliament in exercise of its residual powers under Article 248(1) read with entry 57 in the list of the Seventh Schedule can legislate on the affairs of the Scheduled Tribes.

b At present, there is no provision to assign the responsibility for the failure to achieve the targets set by the Union and the State Government. Statutory provisions should be introduced for assigning responsibility for such failures and for taking punitive actions against those responsible for failure.

There are a number of agencies to oversee the implementation of tribal welfare programs and schemes.

c At the Government of India level, there are at least five agencies, viz., Welfare Ministry, Commissioner for Scheduled Tribes and Scheduled Castes, National Commission for Scheduled Castes and Scheduled Tribes, Secretary in Cabinet Secretariat and Planning Commissions. Besides, according to the Allocation of Business Rules, 1961, as amended, the development and administration of tribal affairs is spread over a number of Ministries and departments. Each Central Ministry is a nodal Ministry for implementation of its schemes and programs concerning the welfare of Scheduled Tribes. Such multiplicity of agencies divides the responsibility and divided responsibility is often nobody's responsibility. Only one Department under the Ministry of Home Affairs should be made responsible for the Tribal Welfare Development Programs. Similarly in the states, one nodal Department should be made responsible for policy, planning and overall co-ordination of the implementation of the tribal welfare programs. It should exercise effective control over the financial outlays earmarked for the tribal development. Any mechanism required for redressal of

grievances should also be evolved under this Department. The Seventh Schedule of the Constitution should be amended to incorporate clauses clearly defining the functional responsibility of the Union and the State Governments. Similarly, laws may be enacted for defining the responsibility of various departments and sectors. Separate administrative apparatus must be evolved for execution of the programs.

(L) **Lack of Tribal Leadership:** Leadership vacuum has adversely affected tribal development. Vested interests have not allowed tribal leadership to emerge. This factor is one of the important causes of discontentment among the tribes.

(S) **Displacement without Adequate Rehabilitation:** In the wake of developmental process, a large chunk of fertile tribal land has been acquired by Government for industrial, irrigation, power, mining and other projects in lieu of meagre compensation which the tribes frittered away in no time.

The tribes are thus deprived of the agricultural land which was the main source of their livelihood. But they did not get the benefits of the development projects. Only the non-tribes were benefited as of availability of irrigation facilities and power as well as job opportunities.

(R) The displaced persons were hit hard by the withdrawal of provision in February 1986, which provided employment to one member of each displaced family in the project constructed on their land. Had the Government acquired alternative land for rehabilitation of the displaced tribes, their culture and community living would have been preserved. For the centrally sponsored schemes, the concerned Central Ministries and Departments should allocate funds under a separate budget sub-head of tribal areas. The funds should meet the entire outlay of the schemes.

(T) The unrestricted influx of outsiders into tribal areas also reduced the tribes to minority. For instance the tribal population in the districts of Ranchi, Singhbhum and Santhal Parganas has sharply decreased from 70.02%, 58.41% and 50.56% respectively as per 1941 Census, to 56.41%, 44.08% and 36.79% as per 1981 Census. Such trend which is also manifest in many other tribal areas poses a serious challenge to their very existence.

(U) **Land Alienation:** Despite protective land laws, the tribal land continues to be alienated to non-tribes for private purposes. This is mainly due to loopholes in the existing laws. The extent of land alienation varies from state to state, but is more intense in the states of Andhra Pradesh, Bihar, Madhya Pradesh, Orissa, Maharashtra, Gujarat, Rajasthan, West Bengal, Assam, Tripura, Kerala, Tamil Nadu and Uttar Pradesh.

(V) **Exploitation in Forestry Operations:** The traditional symbiotic relationship between tribes and forests has been completely shattered due to drastic policy changes. Their traditional forestry rights have been reduced to mere concessions. Due to incomplete survey and settlement operations and records of rights, lands traditionally held and cultivated by the tribes have been claimed as forest lands under the new forest policy. Consequently, a large number of tribes occupying forest lands have been turned into encroachers on their own lands. The traditional protectors of the forests have been branded as the destroyers of the forests.

(W) The tribes are not paid fair price of the minor forest produce by the agents and middlemen. They are not involved in various forestry operations. Collection and transportation activities are handled by the contractors. In many states royalty has also been levied on various items of minor forest produce, which reduces the income accrued to the tribes from the fair price of the minor forest produce. The tribes could be involved in a number of forestry operations but that is not encouraged. The existing arrangements in most of the states are biased in favour of contractors and middlemen.

(X) **Socio-Cultural Factors:** The Scheduled Tribes are distinct ethnic groups without any stigma of untouchability or hierarchical inferiority. Some Indian writers, however, have presented a much distorted account of their social status. They have not only denied an independent social status to the tribes but have described them as "Backward Hindus". This amounts to assimilation of tribes into dominant Hindu society. Such approach will lead to extinction of tribal culture, religious beliefs,

→ MSP introduced recently for MFP

traditions and life style and obliterate all distinctions between castes and tribes. The tribes are very much agitated over such approach. They are fully aware of the plight of the untouchables even though untouchability has been abolished and would not like to become as one of them.

The tribes are integral part of Indian civilisation and possess a very rich cultural heritage. It has stood acid test of time. The first Prime Minister of India, Pandit Jawaharlal Nehru while addressing a conference in 1952, had said, "I am not at all sure which way of living is better, ours or theirs. But in some ways, I am quite certain theirs is better. A great deal of things could be learnt from their culture". Pt. Nehru was opposed to imposition of anything on the tribes. In one of the five fundamental principles, generally called "Tribal Panchsheel", he mentioned, "Tribal people should develop along the lines of their genius and we should avoid imposing anything on them. We should try to encourage in every way their own traditional arts and culture".

The national government has, undoubtedly, the primary responsibility of protection and development of tribes but too much of paternalism is dangerous and becomes counter-productive. It presumes that the tribes are incapable of expressing opinion about their own interest; that they are incapable of safeguarding their own interest; that they cannot identify their needs and that they are incapable of managing their own affairs. In brief, it presumes that the tribes have no administrative capability and the best course of their survival and development is to follow the policies decided by others for them.

The remedy to Prevent Tribal Movements: Objective of justice, social, economic and political can be realised by unfettered participation of tribes in power. Denial of participation means denial of justice. In fact, democracy means people's participation in power in all spheres and at all levels. There is need for careful review of the situation. Loopholes in various existing laws have to be plugged. However, enacting a law alone is not a solution of the problem. Appropriate steps have to be taken for its effective enforcement. Administrative procedures should be simplified. There should be no intermediaries or middlemen between tribes and the Government. Loan and credit facilities should be made available on easy terms and concessional rates of interest so as to reduce dependence of tribes on private money-lenders. Measures for their economic upliftment should be formulated keeping in view their needs.

4 In order to ensure development of tribes, it is necessary to eliminate their exploitation. This can be achieved if the tribes are ensured participation in decision making process and implementation of programs. For this purpose it is essential to extend the provisions of the Sixth Schedule of the Constitution to all the Fifth Schedule areas as well as other tribal majority areas already identified within or outside the Tribal Sub-Plan. This experiment has already proved very successful in North-Eastern States. The funds for the proposed Sixth Schedule Areas should be earmarked separately and released directly by the Union Government to such areas so as to avoid delay by respective State Governments in timely release of funds.

5 Extension of the provisions of the Sixth Schedule to Tribal Sub-Plan areas will go a long way in eliminating exploitation of tribes in land, forest, labour, mining, money-lending etc. and would ensure their balanced development in social, cultural, economic, educational and political spheres. It would also ensure effective participation of the tribes in the management of their affairs. Since the tribal Councils function under the overall control of the State Government, streamlining the administration of the tribal areas should not be a problem. Such a step will assuage tribal sentiments and create an atmosphere of mutual trust and understanding. The tribes have been and are integral part of India. They have to be trusted. There is need of closer understanding of their ethos. Tribes are simple and honest people. They are conscious that whatever be the demand of change, the cultural foundations of tribal society must be safeguarded. They are averse to any kind of imposition. They may be poor, but they are persons of dignity and self-respect. There is a need of change in approach and attitude towards the tribes. Instead of working for them, we should work with them.

Conclusion
The most militant outbreaks, during the colonial period, were those of tribal communities, which revolted more often and far more violently than any other community including peasants in India. The main causes for these tribal revolts are not very far to seek. Firstly, there was great deal of resentment among

Causes of Revolts in Colonial period

the tribal people against the penetration of their areas by outsiders from the plains, such as money lenders, traders, land-grabbers, contractors etc. This resentment was one of the main causes for the revolt of the Santhals in 1855-56. Secondly, the tribal people also resented the tension of British rule to their areas, since the British and its accompanying commercialization strengthened the already present tendencies towards penetration of tribal areas by outsiders from the plains. These outsiders from the plains, in turn, acted as instruments of the British in bringing the tribal people within the influence and control of colonial economy and exploitation. Moreover, the British legal conceptions of absolute private property eroded traditions of joint ownership (like the "Khuntakatti" tenure in Chota Nagpur) and sharpened tensions within tribal society. Thirdly, the activities of Christian missionaries in many tribal areas (particularly in Bihar and Assam hills), though brought education and some promise of social ascent, often provoked an interesting variety of reactions that included hostility as well as attempts to use some Christian tenets in anti-foreign ways. A good example of this is the revolt of the Mundas of Chota Nagpur in 1899-1900 under the leadership of Birsa Munda, who claimed to be a prophet with miraculous helping powers; Fourth cause was the resentment of the tribes against the tightening of control by the colonial state over forest zones for revenue purposes from the 1870 onwards. Shifting cultivation, which required no plough animals and therefore was often essential for the survival of the poorest in rural society, was banned or restricted in the "reserved" forests from 1867 onwards, and attempts were made to monopolize forest wealth through curbs on use of timber and grazing facilities. Some examples of tribal revolts in which this cause played a significant role are the revolts of the Thadoe Kukis of Manipur in 1917, of the Oraons of Chota Nagpur in 1914, of the Chenchus of the Nallamalai hills in A.P., etc.

Social Change among Tribes during Colonial and Post Independent India

The tribal societies have been by and large isolated from the mainstream Indian society for almost centuries. Powerful forces of social and cultural change have been introduced for the first time during the Colonial rule in India when, for the first time, every part of the sub-continent has come under the umbrella of a single political and administrative rule.

Establishment of British rule in India has resulted in introduction of new social legislations, modern administrative machinery and urbanization and industrialization of the Indian society. The most significant factor that contributed to social change amongst the tribal societies is the breakdown of their geographical isolation by construction of roads and railways through the tribal areas. This breakdown of isolation has ensured a steady stream of migration into and out of tribal villages and an enhanced participation of non-tribal people and their cultures in the tribal societies.

As a consequence of this changed scenario, radical changes have occurred in the cultures of tribal people of India. Their traditional social organization, social and cultural value systems, their primitive economic activities were all transformed as a result of the British rule. The traditional authority structures and social control mechanisms gradually lost their hold over the people and modern and secular agencies of social control and modern authority structures started replacing them. Land, which hitherto was considered a ceremonial holding, now became a saleable commodity and private property replaced the notion of communal property. The initiation of commercial economy, consumerism and market exchanges have changed the traditional modes of production, distribution and consumption patterns. The concept of profit has now become the "leitmotif" of every economic transaction. It was during this time that the processes of peasantization and depeasantization operated simultaneously. Most of tribes, after losing their traditional rights over their lands, have to migrate to new areas to either work as agricultural laborers or industrial workers.

On the cultural front, the tribal societies have started assimilating into the Hindu social order through the process of Sanskritization. Conversion of the tribes into Christianity was a common process, as the missionaries have been receiving some form of support from the colonial rulers. The role played by the missionaries in modernizing the tribal societies is enormous. The missionaries imposed a puritanical ethic on the permissive tribal societies. Details of the impact of Christianity are discussed in the following pages.

8. Forest policies reduced tribal rights to Concessions → Psychological stress - Depopulation
9. Industrial Nomadism, Cultural mutation

The social change amongst the tribal communities, as a consequence of colonial rule, has resulted in many tribal movements. Tribal movements were characterized by strong anti-colonial sentiments and often were violent. (Refer to the topic on Tribal Movements for more details). In most parts of India, tribal movements developed religious and political overtones and were aimed at revitalizing their fast disappearing cultures and values. The tribal movements brought about politicization of tribal cause as they largely coincided with national politics and the then burgeoning nationalism as a part of ongoing freedom struggle.

Conclusion

We can conclude by saying that the colonial administration has had a deep impact on the tribal life and has catalyzed social change amongst the tribal societies. Social change during the colonial rule was manifold, touching every aspect of tribal life, including economic, political, religious and cultural. The processes of modernization have been discussed in detail in the preceding chapter.

8.1 Impact of Hinduism, Buddhism, Islam and Christianity on Tribal Societies

socio — Education, Health, Marriage, Rituals, Women's Status, Kinship
 political — Individualism, Equality, Democracy, Revolts
 economic — Jobs, Traditional economy, Vulnerability

1 ✓ In spite of the relative isolation of tribal societies in India, they have been by and large in contact with the mainstream Indian society for a long time. As has been discussed in the earlier chapter, the tribal societies have been involved in cultural exchange and approximation with the mainstream Indian society. As a result, some of the major religions of this country like Hinduism, Christianity, etc. have made inroads into tribal cultures and have had an impact on tribal life.

An overwhelming majority of tribal societies in India have been maintaining exclusivity and are practicing their traditional beliefs and practices. However, we can witness a great amount of overlap between Hinduism and tribal religions in almost all the parts of India. More than 95% of the tribes in the states of Rajasthan, Maharashtra and Gujarat in the West, Andhra Pradesh, Karnataka and Tamil Nadu in the South and Bihar, Orissa and West Bengal in the East are by and large Hindus. Approximately 5% of the tribes are Christians and are predominantly concentrated in the states of North East like Assam, Meghalaya, Nagaland, Manipur and Mizoram. Christian tribal populations are also scattered in the states of Kerala, Bihar, M.P. and Orissa. Only around 0.2% of the entire tribal population of India subscribe to either Islam or Buddhism. Some examples of Muslim tribes include the Siddi of Gujarat, Gujars of the North West Himalayas, Bakrewal of Jammu and Kashmir, some segment of Bhils, Kotis and Dhankasi of Rajasthan and the entire population of Lakshdweep Islands. Buddhist tribes include the Bhutias, Lepchas, Chakmas and Nagas of North East Himalayas and some tribes of Arunachal and Ladakh.

2 ✓ With the exception of completely isolated tribes, almost all the tribes in India exhibit the influence of Hinduism on their cultures. The breakdown of isolation of the tribes with the establishment of British rule has ensured a continuous contact with the Hindu mainstream Indian society and the tribal cultures. However, in spite of culture contact, the tribes have been able to maintain their traditional ethos to some extent. References of tribes in Ramayana & Mahabharata are found.

3 ✓ A majority of the Hindu neighbors of tribes are predominantly represented by peasantry. Hence, one of the greatest impacts of Hinduism is the peasantization of the tribal folk. The tribes, as a result of culture contact, have not only learnt the art of cultivation from their Hindu neighbors, but also adopted local Hindu practices during the process. Hinduization of tribes is not a modern phenomenon as can be seen from the fact that their involvement with the Hindu populations has been repeatedly mentioned in the epics and other traditional texts of Hindu religion.

4(a) The adoption of Hindu belief systems has been a smooth process without any missionary activity on the part of Hindus. Hinduization of the tribes has been smooth also for the fact that the Hindu religion seems to be quite compatible to the existing tribal practices and belief systems and does not require any complete over-hauling of their existing cultures, a prerequisite in case of Islam and Christianity. A tribe can, even after adoption of Hinduism, still continue with its traditional beliefs and values and may, at the same time, adopt new ones, including some practices and deities. Some tribes like the Gonds, Bhils and

- (i) Roy Burman & Sachidanand's study on Oraon
 (ii) D.N. Majumdar's studies on (Khasa, Oraon, Santhal) → Hinduisation.
- 6(b) Juangs of Odisha got Hinduised without any attempt by any agency (muni-notes pg - 284)
- 6(c) Mundas & Oraons of Chhattisgarh have been under great influence of Vaishnavism (muni notes Anthropology Paper 02 - Volume 03 pg - 351)

Bhumji in Central India have become sufficiently Hinduized and ^{use} described as Hindus, even though they do not maintain (in some cases, do not like to maintain) contact with upper caste Hindus.

- 5 ✓ There are also some tribes who are completely Hinduized, in the sense that they have adopted even the caste system, especially of the Scheduled Castes, yet maintaining some traditional forms of tribal culture. One can see an assimilation of religion and magic and the concept of Gotra is more totemic than vedic, as seen in the caste Hindus. This group represents the centre of tribe-caste continuum, a concept we have discussed earlier in this paper.

- 6 ✓ Most of the ethnographic studies conducted in India reveal that the tribes across the country have smoothly assimilated into Hinduism and have been accommodated at different levels of the caste system. The Bhumji, Munda and the Gonds of Central India have by and large assimilated the Rajput culture. The Tharu and the Khasa have assimilated and accepted as Kshatriya. In fact, Kshatriyization seems to be the most popular model of Sankritization for the Indian tribes. (Tribe-Rajput continuum, Tribe-Kshatriya continuum) ^{Scorjit Sinha}

- 7 ✓ As a consequence of this adoption of Hinduism, the changes introduced in the tribal societies are vast and varied. Like for example, apart from the introduction of Hindu customs, dogmas, rituals and belief systems, values like non-vegetarianism, giving up of human and animal sacrifices are also adopted. Along with the transformation, in some tribes came the problems of social disabilities which have been haunting the Hindu caste society anyway. Hindu philosophies like caste system and karma theory have also been gradually adopted by the tribal societies. In fact, the tribal societies started believing that the origin of tribe is from the caste system.

- a Negatives
 Ex: Kol rebellion
- 8 ✓ Hinduism's adoption has resulted in the replacement of simple tribal rituals by highly complicated and cumbersome rituals which now demanded a lot of expenditure and services of a priest. Impact of Hinduism can also be seen in the increase in frequency of child marriages, decline in the significance of youth dormitories and a decrease in the permissiveness of tribal women. Another significant influence Hinduism had on the tribal societies is the decline in the practice of bride wealth or bride price and an increase in the systems of dowry. Introduction of money economy has also coincided with this practice where cash transactions have come to play an important role in marital alliances.

- 9 Conclusion ✓ By and large we can say that wherever Hinduism was freely adopted, according to the tribe's own genius, it has given rise to a unique cultural system which is a result of an amalgamation wherein the culture is neither uniquely Hindu nor completely tribal. Like for example, the Rajvanshi of Bengal, though have adopted the Hindu social system, have not completely given away their traditional social order. They have adopted the gotra or the clan system but still practice their customary clan endogamy, which is unseen amongst the Hindus. The Lambadas of South India take the services of a Brahmin priest for their ritual needs like marriage etc.

Compared to Hinduism, the impact of Islam and Buddhism are very insignificant. When it comes to Islam and Christianity, the two religions are governed by fixed dogmas and they both require a complete rejection of many of the tribal beliefs and practices, which the tribal people very reluctantly give away. Hinduism being more flexible, the tribes could easily adopt its beliefs and practices, though it is only partial and suited to their preference systems.

- Buddhism
- 1 Relatively very few tribal societies have come under the influence of Buddhism. These include the Bhutias, Lepchas, Chakmas and the Nagas of the North East, and few tribal communities of Arunachal and some populations in the Ladakh region of Jammu and Kashmir.
- 2 A significant feature, noteworthy in this context, is that none of the tribal communities have adopted this religion completely. The tribes of Arunachal Pradesh, especially those inhabiting the western regions like the high hills Kamang and Subansiri and Siang districts follow Mahayana or Tibetan Buddhism, while the Khamti, inhabiting the foothills of Lohit district follow Hinayana version of Buddhism. Most of the tribes who have adopted Buddhism continue to follow the social life of their traditional community and participate in traditional rituals. These tribes in some way maintain continuity with their past. Those who have taken to Buddhism maintain a gompa - a sacred place where images of Buddha and sacred books

Haimendorf

- are kept. A sacred specialist called a Lama is attached to a gompa. According to Haimendorf, the tribal people who are attracted by Buddhism, unlike the Christian converts, do not opt out of the social life of their community and continue to participate in the traditional tribal rituals. For example, there are tribal groups who combine their adherence to Mahayana Buddhism with the communal worship of tribal deities whose cult lies in the hands of priests entirely distinct from the lamas in-charge of the gompa.
 ✓ Among the Monpas, elements of ancient Bon religion coexist with the dominant Buddhist faith. The adoption of Buddhism could not cut through their traditional beliefs and practices and Buddhism could not penetrate their society, especially in the realms of ethics and social organization, as the latter are too deeply embedded to be easily given up by the tribal people.

Islam

- ✓ Islam could not penetrate the tribal societies mainly because of its highly dogmatic stand and lack of patronage from Muslim rulers as they were not missionaries like their Christian counterparts and they have always had political objectives. The spread of Islam was hence largely left to the sufi saints and other preachers to spread it. The Siddis of Gujarat, a section of Gujjars of north-western Himalayan region and sections of the Bhils, Dhankasi and the Kotis of Rajasthan have, to some extent, embraced Islam. Gaddi and Bakriwal of Jammu and Kashmir, which are small pastoral communities, have come under the influence of the sufi saints mainly because of the latter's benign attitudes. The only place where people have completely converted to Islam is Lakshadweep. But the influence of Islam amongst the tribal populations in India still remains less than one percent.

Trade route

Tablet

Moplas of Kerala

- 4 There are seven Muslim tribal communities in Lakshadweep - Koya, Malmi, Melacheri, Manikfan, Thakrufan, Thakru and Reveri. The society which was hitherto based on matrilineal ideology has reportedly shown a decline in this ideology as a result of impact of Islam, which is a religion that upheld the patrilineal norms and male authority. The life cycle rituals amongst these groups have come under the influence of Islam. For example, the puberty rites for the girls have been given up and the father has come to assume new responsibilities as opposed to the maternal uncle. Amongst the tribal groups, Islamic personal laws prevail and old rituals are fast disappearing while cross cousin marriages have now become preferential.

Change in kinship system

- In most of the tribes who have come under the influence of Islam, even though the Islamic Great Traditions are paramount, tribal little traditions are still popular. According to Prof. Yogendra Singh, Islamization connotes increased tendency among the converts towards new identity formation based on an increase in orthodox Islamic principles in cultural life. It also results in the conscious rejection of any syncretism, which has thus far existed in the tribal religions owing to their historical relationship with Hinduism. Orthodox organizations like Tableeghi-Jamaat have been in the forefront to remove the pre-Muslim cultural elements from tribal culture in order to maintain Islamic purity. Islam has mainly developed in the tribal societies owing to its egalitarian social structure and is because of this that it was able to make inroads into tribal societies in spite of its highly dogmatic nature.

Yogendra Singh

- 1 Christianity owes its origin and spread to the establishment of the British rule under whose sponsorship a number of missionary organizations have mushroomed almost across the length and breadth of the country. Hectic missionary activities were seen in the areas of North East and parts of Bihar, Orissa and Bengal. The Missions were basically involved in propagation of Christianity and were at the same involved in social service activities, especially in the domains of education and healthcare.

- 2 One of the most positive influences of Christianity on the tribal folk is that it has given them a new confidence to tackle new world and a sense of self respect. But at the same time Christianity has added to the complexities of their socio-cultural existence. It has also been responsible for stratification within the tribal societies, like for example, the Khasis of Meghalaya have been divided into Christian and non-Christian groups. Growing acrimony between these groups has resulted in social tensions and often led to the minority group to migrate to urban areas. The Oraon society which was egalitarian has now been divided on the basis of different denominations of Christianity. 9(b) Traditional institutions like youth dormitories divorces were on decline

- When a tribal community adopts Hinduism, the change is always gradual and never sudden. However, adoption of Christianity results in abrupt and sudden changes in the lifestyles and it calls for radical

- 9(c) - Impact of c' on tribes favoured materialistic tendencies than spiritualistic ones.
 (Stated by Jyothi Sen in Jharkhand).

- 3(b) Vidyaarthi discussed evangelization process in his monographs on Orang & Biharis.
- 3(c) Regional distribution →
- ① Western India - least Impact
 - ② North East - Majors - Assam, Nagaland, Meghalaya, Manipur, Mizoram, Arunachal Pradesh
 - ③ Middle India - Bihar - 10% of tribes are C' - Oraon, Munda are major converts
 - ④ South India - More than in Middle India
Ex: Toda - more than 50% of pop is C'

Anthropology Paper 02 - Volume 03

departures from their pre-existing cultures. Many of their traditional beliefs and practices were denigrated and were discarded. Christianity is a religion that by and large encourages right to personal and private property, patriarchal family and doing away with a number of traditional tribal institutions.

3(d) In most of the cases, adoption of Christianity was a reaction or a revolt of the tribal groups to their ruthless exploitation by Hindu landlords, traders and money-lenders. A case in point is the Kol rebellion and the spread of Christianity in the Chotanagpur region. Christianity is also the first channel of westernization for the tribal people and their regions. Impact of westernization has been dealt in detail in the concerned chapter.

The North Eastern region has witnessed the most radical transformation as a consequence of spread of Christianity. The Missionaries introduced western education and English language has seen considerable promotion. Christianity has replaced the tribal magico-religious belief systems. Christianity has also been responsible for monogamous marriages, spread of orphanages, reduced the incidence of child marriages and discouraged divorces. Private property, patriarchal family, youth dormitories vanished.

To conclude, we can say that the competition that exists in the propagation of religions in the tribal areas has resulted in promoting new forms of communalism. The tribal people should be allowed to maintain their cultural autonomy and should be treated as equal partners in the nation building process. The recent happenings in India and the ugly expressions of communalism are testimony to the fact that tribal people are now being made partners in this ugly war of religious fundamentalism.

8.3 Tribe and Nation-State: A Comparative Study of Tribal Communities in India and other Countries

TRIBE AND NATION STATE → 2(2) Acc to Cohen "Nation state is an outcome of replacement of customary control with formal control".

Traditionally, a nation-state is a specific form of state, which exists to provide a sovereign territory for a particular nation, and which derives its legitimacy from that function. The state is a political and geopolitical entity; the nation is a cultural and/or ethnic entity. The term "nation-state" implies that they geographically coincide, and this distinguishes the nation-state from the other types of state, which historically preceded it. If successfully implemented, this implies that the citizens share a common language, culture, and values — which was not the case in many historical states. A world of nation-states also implements the claim to self-determination and autonomy for every nation, a central theme of the ideology of nationalism. (More on this in Paper 1, Ethnicity and Nation States)

In some cases, the geographic boundaries of an ethnic population and a political state largely coincide. In these cases, there is little immigration or emigration, few members of ethnic minorities, and few members of the "home" ethnicity living in other countries.

Portugal is seen as one of the best examples of a nation-state. Although surrounded by other lands and people, the Portuguese nation has been the same for almost 900 years. Since its foundation, in 1143, Portugal remained as a single nation living in a single country. Ethnically, Portuguese people are related to Celts, Romans, Berbers and Moors. During its long colonial Empire, Portugal received a lot of African "blood". Nowadays, Portugal is a very singular country that is still seen as a nation-state.

Iceland is often seen as a strong example of a nation-state. Although the inhabitants are ethnically related to other Scandinavian groups, the national culture and language are found only in Iceland. There are no cross-border minorities — the nearest land is too far away.

Japan is also traditionally seen as a good example of a nation-state, although it includes minorities of the ethnically distinct Ryūkyū peoples in the south, Koreans, Chinese and Filipinos, and on the northern island of Hokkaidō, the indigenous Ainu minority; see also Japanese Demographics and Ethnic issues in Japan.

Today in 20th century Indian states were created in which Non-tribals are in dominant position (Ex: India) (except in Saudi Arabia - only tribal nation state)

(6) India : Under cloak of Industrialisation & Dev, the tribal areas in NE, Central & Eastern India were occupied. This resulted in the demand for separate states to protect their culture, identity, values.

(7) Africa - The colonising pop. (Europeans) have finally claimed the nation state as its own, after overrunning & exploiting indigenous pops & their resources. The former were paternalistic, wanted to proselytise & also extract the physical/natural resources of the country. Anthropology Paper 02 - Volume 03

Both Iceland and Japan are island nations. Portugal, curiously, is not an island and is surrounded by other historic nations in Europe.

The notion of a "national identity" also extends to countries that host multiple ethnic or language groups. Ex: Switzerland is constitutionally a confederation of cantons, and has four official languages, but it has also a 'Swiss' national identity, a national history, and a classic national hero, Wilhelm Tell.

Many historical conflicts have arisen where political boundaries do not correspond with ethnic or cultural boundaries. For example, the Hatay Province was transferred to Turkey from Syria after the majority-Turk population complained of mistreatment. The traditional homeland of the Kurdish people extends between northern Iraq and eastern Turkey, and western Iran. Some of its inhabitants call for the creation of an independent Kurdistan, citing mistreatment by the Turkish and Iraqi governments. An armed conflict between the Kurdistan Workers Party and the Turkish government over this issue has been ongoing since 1984.

Belgium is a classic example of a disputed nation-state. The state was formed by secession from the United Kingdom of the Netherlands in 1830, and the Flemish population in the north speaks Dutch. The Flemish identity is also ethnic and cultural, and there is a strong separatist movement. The Walloon identity is linguistic (Francophone) and regionalist. There is also a unitary Belgian nationalism, several versions of a Greater Netherlands ideal, and a German-speaking region annexed from Prussia in 1920, and re-annexed by Germany in 1940–1944.

China covers a large geographic area, and uses the concept of "Zhonghua minzu" — "a Chinese people" — although it also officially recognizes the majority Han ethnic group, and no fewer than 55 national minorities.

Where part of the national group lives in a neighboring nation-state, it is usually called a national minority. In some cases states have reciprocal national minorities, for instance the Slovaks in Hungary and the Magyars (ethnic Hungarians) in Slovakia.

National minorities should not be confused with a national Diaspora, which is typically located far from the national border. Most modern Diasporas result from economic migration, for example the Irish diaspora.

The possession of dependent territories does influence the status of a nation-state. A state with large colonial possessions is obviously inhabited by many ethnic groups, and is not a mono-ethnic state. However, in most cases, the colonies were not considered an integral part of the motherland, and were separately administered. Some European nation-states have dependent territories in Europe. Denmark contains virtually all-ethnic Danes and has relatively few foreign nationals within it. However, it exercises sovereignty over the Faroe Islands and Greenland.

Minorities, Tribes and Nation States

(Note that tribes and minorities are interchangeably used)

(i) The most obvious deviation from the ideal of 'one nation, one state', is the presence of minorities, especially ethnic minorities, which are clearly not members of the majority nation. The nationalist definition of a nation is always exclusive: no nation has open membership. In most cases, there is a clear idea that surrounding nations are different, and that includes members of those nations who live on the 'wrong side' of the border. Historical examples of groups, who are specifically singled out as outsiders, are the Roma and Jews in Europe.

(ii) Negative responses to minorities within the nation-state have ranged from state-enforced cultural assimilation, to expulsion, persecution, violence, and extermination. The assimilation policies are usually state-enforced, but violence against minorities is not always state-initiated: it can occur in the form of mob violence such as lynching or pogroms. Nation-states are responsible for some of the worst historical

China : Minorities are all those who are non-Hans. The Communist China has compromised its ideology - (political & social equality) in favour of a nation-state dominated by Hans. The minorities are given only enough concessions to pay lip service to equality but in real terms they are subordinated.

9 Before European interference, though there were conflicts b/w indigenous tribes, their nation-state was coordinating with the tribal leaders. But, British & German's power play resulted in a situation where tribes became enemies of their own state. American capitalism entered & made the situation worse. With the collapse of state in 1979, there is a resurgence of cultural identity.

10 Russia → Till 1930s, again before European's entry, Russia was successful in integrating multiracial & multiethnic groups - In ^{central}, 1.7 million Europeans entered Soviet ~~Asia~~. Representation in govt of indigenous pop reduced. - Smoldering dissension led to dissolution of Soviet Union in 1991.

Anthropology Paper 02 - Volume 03

examples of violence against minorities—that is, minorities that were not considered part of the nation.

However, many nation-states do accept specific minorities as being in some way part of the nation, and the term national minority is often used in this sense. The Sorbs in Germany are an example: for centuries they have lived in German-speaking states, surrounded by a much larger ethnic German population, and they have no other historical territory. They are now generally considered to be part of the German nation, and are accepted as such by the Federal Republic of Germany, which constitutionally guarantees their cultural rights. Of the thousands of ethnic and cultural minorities in nation-states across the world, only a few have this level of acceptance and protection.

Multiculturalism is an official policy in many states, establishing the ideal of peaceful existence among multiple ethnic, cultural, and linguistic groups. Many nations have laws protecting minority rights. India is a classic example.

The spread of European Colonization, modernization of economies, implementation of community development programs and increased transport and communication infrastructure connecting all the people and the emergence of modern nation-states and introduction of uniform administrative structures has resulted in greater and active interactions between the tribes and non-tribe populations. As a consequence, the tribal groups are no more identified as "primitive groups" but as another ethnic groups living in the larger population of a nation.

Many nations in the world have maintained a policy of "non-interference" with their tribal populations and have always ensured the autonomy of tribal areas in the overall politico-administrative structures in the modern nation-states. It's only the proactive industrialization and economic development of the nations that warranted governments to make 'in-roads' into tribal areas, a process that unleashed a number of challenges for the nation-states vis-à-vis the tribal groups. In this context, we have discussed the issues of tribal welfare and administration and in this chapter we shall examine the approach adopted by other nations.

CHINA

In 1990, the population of China was 1,133,682,501 persons, of whom 1,042,482,187 belonged to the Han nationality, the people generally referred to as Chinese. The remainder were divided among some fifty-five "minority nationalities" that are recognized officially by the state, at least 749,341 persons claiming membership in ethnic groups not yet accorded official recognition, and 3,421 naturalized foreigners. The recognized minorities range in size from the 15,489,630 Zhuang to the 2,312 Lhoba; at least eighteen groups have populations over 1,000,000.

There are fifty-six recognized minzu, meaning "nation," "nationality," "ethnic group," or "people." All but the Han are referred to as "shaoshu minzu." The criteria for identifying these groups are unevenly applied and guided in part by political considerations. The term implies legal equality together with subordination to the higher state authority that governs Han and minorities alike. It is worth noting that the term minzuxue, often translated as "ethnology," refers only to the study of China's minority peoples.

Since 1949, a number of areas have been designated as autonomous regions wherein the minorities are guaranteed, within limits, the rights to express and develop their local cultures and representation in the political arena. There are five large autonomous regions (Tibet, Inner Mongolia, Guangxi Zhuang, Ningxia Hui, Xinjiang Uigur), each named after the predominant minority group. These regions contain multiple nationalities, the Han now being the largest group in all but Tibet. In addition, by 1985 there were thirty autonomous prefectures and seventy-two autonomous counties, or "banners," often of mixed ethnicity and sometimes listing two or three minority groups in their official name. Under continuing pressure to grant minorities greater autonomy and representation, the government organized minzuxiang (minority townships) in the 1980s for areas of mixed settlement outside of the larger autonomous units. These townships incorporate Han and minority villages under one administration at the lowest level of government. Minority representatives are thus guaranteed seats at various administrative levels from the township up through the county and prefecture, and there are reserved seats for minority

of ethnic equality but the European pop, misguided by religious theology & wrong interpretation of Darwinism have treated the indigenous as sub-humans, rather non-humans.

(12) In the current phase of history, the minorities are aspiring to reassert their position & reclaim their lost assets. Politically, many small pops would want to secede from the mother nation.

(13) - In today's capitalistic world, equitable global distribution of resources isn't possible with the existing structure of nations states is yet to be seen Anthropology Paper 02 . Volume 03 of nations To what extent the self-determination of tribes & minorities endangers the very existence of nations states is yet to be seen
representatives in the provincial and national peoples' congresses. The State Nationalities Affairs Commission, directly under the State Council, also includes minority representatives, as do provincial and prefectural branches.

Within the autonomous units the state sets some policies. For example, the government has prohibited landlordism, slavery, child marriages, forced marriages, elaborate festivals, and what the state regards as harmful facets of religion and traditional medicine everywhere in China since the early days of the Revolution. The state also controls population transfers: minority people cannot opt to resettle in the autonomous region of ethnic choice, and the authorities even discourage travel across county boundaries. Most minorities are not yet affected by the one-child policy of recent years, although the government encourages them to practice family planning. Also, for registration purposes, most minority people must select a Chinese name for their children and follow the Chinese model of the paternal surname. Aside from these constraints, the minorities are free to use their own languages, follow culturally valued styles of housing, dress, and diet, practice customs that are not in direct violation of national laws, develop and perform their traditional arts, and practice their own religions.

One could argue that since 1949 some of the earlier differences between local cultures or nationalities have weakened or disappeared. This occurrence is a result of a number of factors: the spread of Mandarin as the language of the schools and media; the uniform political and social ideology promoted via the Communist party, the Youth League, the Women's Federation, the Peasants Association, and the Peoples Liberation Army; nationwide participation in a series of political campaigns; state control of the news and entertainment media; and the uniformity of socioeconomic organization between 1950 and the early 1980s. Furthermore, the suppression of some local religious practices and the development of secularized, state-revised festivals and state guidelines for betrothals, weddings, and funerals have all contributed to the blurring of the differences between regional Han cultures, and they have also had their effect on the practices of the minorities.

Over recent decades, population movements have also played a part. Han families from diverse regions have been resettled in large numbers in newly developing areas such as the northeastern provinces, Xinjiang, and Inner Mongolia, whereas some minority communities have been relocated closer to Han areas of settlement. During the Cultural Revolution years this process was accelerated by the transfer of at least 12 million young Han urbanites to rural villages and state farms, some of these in areas primarily inhabited by the ethnic minorities. Many of these transfers have become permanent. Since the 1980s there has been population movement from the countryside into established urban areas, both by assignment and voluntarily, heavy immigration into the new Special Economic Zones and Development Zones, and a flow into underpopulated areas that hold promise of economic opportunity.

Despite these unifying trends, there are also signs of intensification of ethnic awareness and sentiment among the minorities. Some of the official classifications have taken on new meaning. This development is clearly evident in the 1990 census, which reports a large jump in the number of individuals or communities claiming minority status. Some groups have had a dramatic rise in population since the 1982 census, most markedly the Manchu, Tujia, She, Gelao, Xibe, Hezhen, Mulam, and those claiming Russian nationality. There is increased demand for school texts and other publications in minority languages (including tongues formerly classed as "dialects"), with recognized standardized romanizations or reformed versions of earlier traditional writing systems. With these come demands for separate schools at the primary level, and the recognition of additional autonomous counties or townships in areas with large minority populations. Among many groups there is revival, elaboration, or even invention of local dress and other visible markers of ethnic difference. There is also increased production of local craft items (or items with a minority "feel" to them) for a wider market, as well as a revitalization of local festivals. Some of these changes relate to the growing international and internal tourist market, as at the Dai Water-Splashing Festival in Xishuangbanna, the Miao Dragon Boat Festival in eastern Guizhou, or the tourist souvenirs and entertainment provided by the Sani (Yi) at the Stone Forest near Kunming. Among the Hui and other Islamic groups, religion has been revitalized and is tolerated by the state because of its desire to maintain and increase good foreign relations with Islamic countries. Buddhism among the Dai and Christianity among the Miao, Yi, Lisu, Lahu—and, of course, the Han themselves—are tolerated for

similar reasons.

The state allows and in some ways even encourages the upsurge of ethnic expression, as long as it does not move toward separatism. China takes pride in describing itself as a multinational country. Minority themes figure strongly in contemporary Chinese painting and graphics, and television frequently airs travelogues and commentaries about the minorities and performances by song-and-dance ensembles whose material is drawn in large part from the minority cultures. Books about the strange customs of the shaoshu minzu find a wide market; occasionally, they also spark protests by the minorities.

RUSSIA

The main indigenous populations of Russia are from the North. The Russian North, extends across a distance of 6000 km from the Finnish and Norwegian boundary through the Urals and Siberia to the Bering Strait and the Pacific Ocean. It covers vast areas of taiga (boreal forests), tundra (treeless swamps and pasture lands), and polar deserts. The north-south extension of this belt widens from about 1000 km in Europe to about 3000 km in central Siberia and the Russian Far East.

Approximately 20 million people live in this land, mainly concentrated in towns and settlements along the rivers and in the industrial centres. Only about 180,000 of them belong to approximately 30 small-numbered, aboriginal groups - the indigenous peoples of the North. Their majority live in small villages close to their subsistence areas, where they pursue traditional occupations like reindeer-herding, hunting and fishing. But the reality these people face today is anything but an idyllic carryover from the past.

Since the colonization of the North, large expanses have gradually been converted into areas for alien settlement, transportation routes, industry, forestry, mining and oil production, and have been devastated by pollution, irresponsibly managed oil and mineral prospecting, and military activity.

In tandem with the environmental disaster went the social decay of the indigenous societies since the early Soviet era, with collectivisation of subsistence activities, forced relocations, spiritual oppression, and destruction of traditional social patterns and values. The result was the well-known minority syndrome marked by loss of ethnic identity, unemployment, alcoholism, diseases, etc.

The recent socio-economic crises of Russia which came along with the transition to a market economy, has led to a break-down of most of the supply and transportation system in remote areas of the North. Having been incorporated into the alien Soviet economic system, made dependent on modern infrastructure and product distribution, the people now find themselves left alone without supplies, medical care, rising mortality, and the economic means and sufficient legal expertise to deal with the situation. The desperate road back to the old ways of life has tempted many, but is often hampered by the degradation or destruction of the natural environment.

Against this horrendous background, the cultural survival of these small ethnic groups may seem almost impossible. But they fight tenaciously, showing an unbelievable endurance, and their case has already won ground in many national and international forums.

Like everywhere on earth, the Russian North has been subject to migration of peoples all through human history. Until ca. 2000 years ago, the North was dominated by ancient Siberian tribes whose cultural relations are poorly known. Pressure from the extension of southerly adjacent peoples gradually drove these tribes to the north, at the same time as they mingled with - and were partly assimilated into - the newcomers.

One group of descendants of these ancient Siberian tribes is comprised of the Yupik (eastern Eskimo branch) and Aleuts, who mostly migrated to Alaska and form a common culture group with other North American peoples. In Russia, less than 2000 Yupik live in villages at the Bering Strait, and some 700 Aleuts on the Komandorsk Islands and in Kamchatka.

The largest of the Proto-Siberian language groups is the Palaeo-Asiatic group, represented by the

Chukchi, Koryaks and Itelmens. On the arrival of the Russians, these peoples inhabited most of Chukotka, Kamchatka and the areas around the northern Sea of Okhotsk. They are today concentrated to the Chukotkan and Koryak autonomous areas in the far north-east. With population numbers of 15,000 (Chukchi) and 9000 (Koryaks) these peoples belong to the larger ethnic groups. The Itelmens (2500) were once also wide-spread across Kamchatka. They are now restricted to a small land strip at the south-western coast. Large parts of their former population are mingled with Russian immigrants, speaking the Russian language, but have developed a distinctive local culture. These people call themselves Kamchadals and claim the official status of an indigenous people that they had lost in 1927. Their number is about 9000.

The Yukagirs, another Proto-Siberian group, once inhabited huge parts of north-eastern Siberia between the Lena mouth and the Bering Strait. The remaining 1000 people are mainly restricted to the Kolyma area in north-eastern Yakutia. The Chuvans (1300) at the upper Anadyr River are originally a Yukagir tribe that has adopted the Chukchi language, and assimilated partly into Chukchi, and partly into Russian culture. Isolated linguistic remains of an ancient Siberian population are also represented by the Nivkh (4600) at the Amur mouth and on northern Sakhalin, and the Kets (1100) of the middle Yenisey River valley.

The white man's conquest of the Russian North, Siberia and the Far East does not stand far behind the atrocities known from other parts of the world. The tsarist intention was to subject the entire northern part of Asia to its rule because of the expected rich natural resources. Peoples were rendered tribute-payers. They were forced to pay a tax, yasak, in exchange for the promise of protection by the Tsarist Empire. Yasak consisted mostly of furs. The often very high tax requirements changed the occupational pattern of many ethnic groups and endangered their subsistence.

The Tsar's order read that the native peoples should be treated respectfully and accommodately, while military actions should only be applied against armed revolts. But the local governors and taxmen had their own laws, if any. Historians report continual pillaging and violent encroachment resulting in the extermination of entire nations. A usual procedure to make the native peoples pay yasak was to take hostages, often respected elders. It was also usual to abduct, or buy, and enslave women and children. Tax raids could escalate into pillage and sometimes murder raids. Many times, the entire subsistence basis of a local indigenous group was destroyed, and they died of cold or hunger. In places, the oppression continued into the 19th century,

Towards the end of the 17th century, most of Siberia to the Pacific coast was subject to Russian control. When Russian economies became worse, politicians decided to subdue the last resisting and opposing peoples, the Chukchi and Yukagirs, by military force. The Yukagirs were reduced to approximately half their population. During the smallpox epidemics of the 18th century and subsequent disasters, another 80% of the remaining population disappeared.

In areas of massive Russian settlement, the indigenous population was subject to russification with respect to language, economy, and social organisation. During the 19th century, large areas on both sides of the Trans-Siberian Railway were cleared of native population. Southern Siberia was affected most profoundly, and from there areas along the main waterways. But in other places, the opposite might happen. The most striking example is the yakutisation of Russian settlers in Yakutiya, where the native population had a strong social network that was not easily broken.

The official Russian policy towards the indigenous peoples in the 19th century was not always bad. Considerations of humanity and concern for the exploited natives led to attempts to control the situation by means of various (rather ineffective) laws forbidding slavery, limiting the exaction of tribute, prohibiting the sale of liquor and, as late as 1912, forbidding Russian traders to enter certain native territories. Still, the major trend of the development continued: loss of land, economic decline, dissolution of subsistence patterns, disintegration of the social framework.

During the post-revolutionary Civil War that lasted from 1917 to 1924 (locally in the Far East), the Soviet administration replaced the tsarist governmental system. Passive victims of warfare between the two

Anthropology Paper 02 - Volume 03

Russian factions, the indigenous population slid into a dispute between two competing political lines: one intended to secure a development according to each people's own cultural premises, while the other - the Stalinist line - aimed at the complete elimination of ethnic differences and the integration of all national groups into a common Soviet society. The Stalinist line won towards the end of the 1920s.

The administrative subdivision of Russia into national areas and districts was meant to reflect the ethnic composition of the respective territories. This was originally supposed to guarantee the influence of the individual peoples on local development, which was never realised. In contrast, the strict application of the class law turned the social pattern of the indigenous population upside down. Their natural leaders, wealthy reindeer owners and shamans, for instance, were regarded as exploiters and excluded from political positions, while the young, elected "working class" people often neither felt competent nor were expected by their fellow-tribesmen to make decisions on their own.

In the 1920s, there was a variety of initiatives to compensate for economic loss suffered by the indigenous population during the Civil War, such as economic support bills, tax exemption for minorities, erection of support centres, etc. But during the 1930s, under the dictatorship of Stalin, most of the economic and social structure that might still have been intact was destroyed. The large-scale industrialisation of the Soviet Union needed the resources of the North. The state firms imported their own workers who stood outside the local authorities' jurisdiction. Natives whose subsistence was destroyed became dependent on service-functions for the foreign industry or sought refuge in more hostile mountain and tundra areas.

Traditional reindeer herding, hunting and fishing occupations were forcefully transformed into collective farms, kolkhozes, all across the Soviet Union. Local uprisings were put down and punished hard, for instance, in the Nenets and Taymyr areas in 1930-32. A number of national areas were dissolved, and the North was divided between various ministries. No controlling agency existed that could survey the continuous colonisation and exploitation of the land and the fate of its native inhabitants.

In 1941 th Russia was drawn into World War II. Many indigenous individuals had to fight at the fronts. The lack of young men for domestic occupations especially affected the vulnerable, small indigenous societies. Excessive numbers of domestic animals had to be slaughtered, and river mouths were depleted of fish in the fight against hunger. The thousands of men returning from the front had changed their social attitudes and thus accelerated cultural assimilation. European immigration to Siberia increased.

In the 1950s and 1960s, a large-scale campaign was pursued to lead the peoples into the "modern socialist civilization", by forced relocation into urban or semi-urban areas. The enforcement consisted in depriving rural areas of hospitals, schools and shops. Nomads were officially declared primitive human beings and were urged to settle. But there was not sufficient work in the new settlements to replace the lost traditional occupations. The consequences for many were further loss of economic ability and social structure, rising criminal rates and abuse of alcohol. In 1980, the ethnically based administrative areas were ceased, the word "minorities" was removed from law texts, and the local administrative bodies lost all but consulting functions.

The educational policies of Soviet Russia towards the indigenous peoples had been changing radically. The school system was renewed and underwent an important development in the 1920s. Linguists developed alphabets for all language groups, with special letters based on the Latin alphabet. Illiteracy dropped markedly. In 1937, Stalin forced the application of the Cyrillic alphabet for all languages, and linguists that had worked on customised alphabets were imprisoned as public enemies. A policy started that was aimed at wiping out all ethnic identity. After 1957, teachers were even punished for speaking anything but Russian to the pupils outside the mother tongue lessons.

The boarding-school system - originally meant to give nomad children the opportunity of a higher education - had a destructive influence on the minority cultures when extended to primary school level. Children were growing up far from their parents and returned at an age of 16-17 as almost complete strangers with often weakened ties to their ethnic origin and language, and almost without practical skills for the traditional occupations. As a result, the system favoured assimilation into the Russian society. The

decrease in people using or understanding their native language is enormous. Today, the elder generation - above the age of 50 - carries on the language.

It would, however, be wrong to neglect positive developments during the Soviet era. One important example is that the role of women in the society achieved benefits, as many taboos were broken. Other examples were the improvement of health care, reduction of infant mortality, etc.

Environmental disaster.

Until ca. 1930, industrial development and large-scale extraction of natural resources by the colonialists were largely confined to the area adjacent to the Trans-Siberian Railway. From 1930, large industrial projects were started in the North that caused severe, though local, environmental damage: intensive forestry in the Igarka area (lower Yenisey), nickel mining at Norilsk (Yenisey mouth), and gold mining in Yakutiya. The major impacts in the far North started in the mid-1950s, especially the chopping down of forests for timber over great expanses. Vast hunting grounds were destroyed. Large amounts of timber were left to rot. The Soviet Far East lost more than 30% of its forests.

The oil and gas boom started in the mid-1960s. The largest oil deposits were in the Khanty-Mansiysk Autonomous Area. Enormous forest areas were razed and the land was devastated by careless tracked-vehicle driving; rivers and bogs were polluted, and large areas became worthless for any sort of primary subsistence. In addition to the devastation of nature, the alien workers abused the indigenous population through pillage, theft, killing of reindeer, and destruction of sacred sites, even robbery, rape, murder and burning of homes. The exploitation of the Yamal Peninsula was carried out quickly, though experts had not agreed on its profitability.

Both areas suffered immense loss of land and water resources. Railways and pipelines cut off reindeer migration routes. In the Khanty-Mansiyskiy and the Yamalo-Nenetskiy Avt. Okrug together, 110,000 km² of reindeer pastures, 28 economically valuable rivers, 177 km² of spawning areas and feeding fields were destroyed. Similar encroachments were made in the Far East in 1970-87, where reindeer herds decreased by 30-40%.

A significant impact of a different kind is nuclear pollution. From the atmospherical atomic bomb testing in Novaya Zemlya in the 1960s, large areas suffered radioactive contamination. In addition, nuclear explosions were often used for civil purposes like mining, attempts to divert rivers, and seismic sounding, some of which resulted in local radioactive fallout. High rates of related diseases are known from, for instance, Chukotka, northern Yakutiya, Kolguyev Island, and the Kola Peninsula. The tuberculosis rate - high throughout the North - is locally close to 100%. Other lung diseases are common, while infant mortality is quickly rising.

Political reorganization

With the beginning of the Perestroika policy, movements against the disastrous situation for the Northern indigenous peoples started with an increasing frequency. In 1986, Koryaks succeeded in preventing a village liquidation in Kamchatka. Other examples of successful protests followed, like the fight of the Udege people in the Bikin Valley (Primorye) against the cutting of timber by foreign companies in the early 1990s. A large amount of regional associations developed which were supposed to defend indigenous interests.

In 1989, an expert meeting on minority problems achieved agreement on the necessity of severe changes in the Soviet minority policy. The experts pronounced that the best way to secure the future of the Northern minorities would be the establishment of ethnic territories with self-determination, cessation of the former policy of forced relocation, replacement of large-scale development programs by locally adjusted small-scale projects, etc.

An important initiative by the minorities themselves was the formation of the embracing "First Congress of the Small Peoples of the North" in Moscow, March 1990. It resulted in the establishment of the "Russian

Anthropology Paper 02 - Volume 03

Association of Indigenous Minorities of the North, Siberia and the Far East" (RAIPON), under the first elected president, Vladimir Sangi (Nivkh), who was later replaced by Yeremey Aypin (Khant) and then by Sergey Kharyuchi (Nenets). The association became the official representation of the Northern indigenous people towards Russian authorities and government. International institution building programs, initiated by ICC (Inuit Circumpolar Conference) Canada in 1995, helped to develop the organisation into a significant political tool which today spearheads the peoples' struggle for survival.

In 1998, RAIPON - together with the other embracing Arctic indigenous peoples' organisations, Saami Council, ICC and Aleut International Association - was accepted as a permanent participant in the newly established (1996) Arctic Council. The main goal of this council is international co-ordination of development in the Arctic, with the pronounced participation of her indigenous populations.

Environment, health, legal issues and economy are today on the agenda of the indigenous associations. RAIPON and associated organizations are working hard towards the Russian authorities concerning the emplacement of a satisfactory legal basis for indigenous rights. So-called ethnic communities are formed, where the native population executes a sort of self-determination in terms of traditional subsistence. Environmental violations have been brought to trial. Health-related development projects are initiated. Native communities are trying to go back to their traditional social clan structure and to revive the old ways of life in order to survive the present socio-economic crisis. The newly developed consciousness among the people, that their future is in their own hands, was nothing but a rhetoric phrase just a little more than a decade ago.

Enormous progress has been made during the past decade, but much more is still to be done. One of the main obstacles is the lack of financial means - not only for the associations, but also at an individual level. In many rural areas, there is shortage of basic things like food, equipment and firewood. The need for continuous support from the outside is fundamental.

The way the indigenous peoples of Russia have chosen is the one of partnership - with their neighbors, with the authorities - and at the global level. They are increasingly accepted as equal partners in the process of sustainable development in international fora. Progress at the domestic level is still very slow due to the reactionary behaviour of many local officials. But they fight with endurance.

United States of America

Native Americans in the United States are the indigenous peoples from the regions of North America now encompassed by the continental United States, including parts of Alaska. They comprise a large number of distinct tribes, states, and ethnic groups, many of which are still enduring as political communities. There is a wide range of terms used, and some controversy surrounding their use: they are variously known as American Indians, Indians, Amerindians, Amerinds, or Indigenous, Aboriginal or Original Americans.

The European colonization of the Americas nearly obliterated the populations and cultures of the Native Americans. During the 16th through 19th centuries, their populations were ravaged by conflicts with European explorers and colonists, disease, displacement, enslavement, internal warfare as well as high rate of intermarriage. Scholars now believe that, among the various contributing factors, epidemic disease was the overwhelming cause of the population decline of the American natives.

The first Native American group encountered by Christopher Columbus in 1492, were the Island Arawaks (more properly called the Taino) of Boriquen (Puerto Rico), the (Quisqueya) of the Dominican Republic, the Cubanacan (Cuba). It is said that of the 250 thousand to 1 million Island Arawaks, only about 500 survived by the year 1550, and the group was considered extinct before 1650. Yet DNA studies show that the genetic contribution of the Taino to that region continues, and the mitochondrial DNA studies of the Taino are said to show relationships to the Northern Indigenous Nations, such as Inuit (Eskimo) and others.

European settlers brought diseases against which the Native Americans had no natural immunity. Chicken pox and measles, though common and rarely fatal among Europeans, often proved deadly to

Native Americans. Smallpox, always a terrible disease, proved particularly deadly to Native American populations. Epidemics often immediately followed European exploration, sometimes destroying entire villages. While precise figures are difficult to arrive at, some historians estimate that up to 80% of some Native populations died due to European diseases.

In 1617-1619 smallpox wiped out 90% of the Massachusetts Bay Indians. As it had done elsewhere, the virus wiped out entire population groups of Native Americans. It reached Lake Ontario in 1636, and the lands of the Iroquois by 1679, killing millions. During the 1770's, smallpox killed at least 30% of the West Coast Native Americans.

During the American Revolutionary War, the newly proclaimed United States competed with the British for the allegiance of Native American nations east of the Mississippi River. Most Native Americans who joined the struggle sided with the British, hoping to use the war to halt further colonial expansion onto Native American land. Many native communities were divided over which side to support in the war. For the Iroquois Confederacy, the American Revolution resulted in civil war. Cherokees split into a neutral (or pro-American) faction and the anti-American Chickamaugas, led by Dragging Canoe.

Frontier warfare during the American Revolution was particularly brutal, and settlers and native tribes committed numerous atrocities. Noncombatants suffered greatly during the war, and villages and food supplies were frequently destroyed during military expeditions. The largest of these expeditions was the Sullivan Expedition of 1779, which destroyed more than 40 Iroquois villages in order to neutralize Iroquois raids in upstate New York. The expedition failed to have the desired effect: Native American activity became even more determined.

The British made peace with the Americans in the Treaty of Paris (1783), and had ceded a vast amount of Native American territory to the United States without informing the Native Americans. The United States initially treated the Native Americans who had fought with the British as a conquered people who had lost their land. When this proved impossible to enforce, the policy was abandoned. The United States was eager to expand, and the national government initially sought to do so only by purchasing Native American land in treaties. The states and settlers were frequently at odds with this policy.

In the nineteenth century, the incessant Westward expansion of the United States incrementally compelled large numbers of Native Americans to resettle further west, often by force, almost always reluctantly. Under President Andrew Jackson, Congress passed the Indian Removal Act of 1830, which authorized the President to conduct treaties to exchange Native American land east of the Mississippi River for lands west of the river. As many as 100,000 Native Americans eventually relocated in the West as a result of this Indian Removal policy. In theory, relocation was supposed to be voluntary (and many Native Americans did remain in the East), but in practice great pressure was put on Native American leaders to sign removal treaties. Arguably the most egregious violation of the stated intention of the removal policy was the Treaty of New Echota, which was signed by a dissident faction of Cherokees, but not the elected leadership. The treaty was brutally enforced by President Andrew Jackson, which resulted in the deaths of an estimated four thousand Cherokees on the Trail of Tears.

The explicit policy of Indian Removal forced or coerced the relocation of major Native American groups in both the Southeast and the Northeast United States, resulting directly and indirectly in the deaths of tens of thousands. The subsequent process of assimilation was no less devastating to Native American peoples. Tribes were generally located to reservations on which they could more easily be separated from traditional life and pushed into European-American society. Some Southern states additionally enacted laws in the 19th century forbidding non-Indian settlement on Indian lands, intending to prevent sympathetic white missionaries from aiding the scattered Indian resistance.

At one point, President Jackson told people to kill as many bison as possible in order to cut out the Plains Indian's main source of food. Later in time there were fewer than 500 bison left in the Great Plains.

Conflicts, generally known as "Indian Wars", broke out between U.S. forces and many different tribes. U.S. government authorities entered numerous treaties during this period, but later abrogated many for

various reasons. Well-known military engagements include the Native American victory at the Battle of Little Bighorn in 1876 and the massacre of Native Americans at Wounded Knee in 1890. This, together with the near-extinction of the American Bison that many tribes had lived on, set about the downturn of Prairie Culture that had developed around the use of the horse for hunting, travel and trading.

American policy toward Native Americans has been an evolving process. In the late nineteenth century, reformers, in efforts to "civilize" or otherwise assimilate Indians (as opposed to relegating them to reservations), adapted the practice of educating native children in Indian Boarding Schools. These schools, which were primarily run by Christian missionaries, often proved traumatic to Native American children, who were forbidden to speak their native languages, taught Christianity instead of their native religions and in numerous other ways forced to abandon their various Native American identities and adopt European-American culture. There are also many documented cases of sexual, physical and mental abuses occurring at these schools.

The Indian Citizenship Act of 1924 gave United States citizenship to Native Americans, in part because of an interest by many to see them merged with the American mainstream, and also because of the heroic service of many Native American veterans in World War I.

There are 561 federally recognized tribal governments in the United States. These tribes possess the right to form their own government, to enforce laws (both civil and criminal), to tax, to establish membership, to license and regulate activities, to zone and to exclude persons from tribal territories. Limitations on tribal powers of self-government include the same limitations applicable to states; for example, neither tribes nor states have the power to make war, engage in foreign relations, or coin money (this includes paper currency).

According to 2003 United States Census Bureau estimates, a little over one third of the 2,786,652 Native Americans in the United States live in three states: California at 413,382, Arizona at 294,137 and Oklahoma at 279,559.

As of 2000, the largest tribes in the U.S. by population were Navajo, Cherokee, Choctaw, Sioux, Chippewa, Apache, Lumbee, Blackfeet, Iroquois, and Pueblo. In 2000, eight of ten Americans with Native American ancestry were of mixed blood. It is estimated that by 2100 that figure will rise to nine out of ten. In addition, there are a number of tribes that are recognized by individual states, but not by the federal government. The rights and benefits associated with state recognition vary from state to state.

Some tribal nations have been unable to establish their heritage and obtain federal recognition. The Muwekma Ohlone of the San Francisco bay area are pursuing litigation in the federal court system to establish recognition. Many of the smaller eastern tribes have been trying to gain official recognition of their tribal status. The recognition confers some benefits, including the right to label arts and crafts as Native American and permission to apply for grants that are specifically reserved for Native Americans. But gaining recognition as a tribe is extremely difficult; to be established as a tribal group, members have to submit extensive genealogical proof of tribal descent.

Military defeat, cultural pressure, confinement on reservations, forced cultural assimilation, outlawing of native languages and culture, termination policies of the 1950s and 1960s and earlier, slavery, and poverty have had deleterious effects on Native Americans' mental and physical health. Contemporary health problems suffered disproportionately include alcoholism, heart disease, diabetes.

As recently as the 1970s, the Bureau of Indian Affairs was still actively pursuing a policy of "assimilation", dating at least to the Indian Citizenship Act of 1924. The goal of assimilation — plainly stated early on — was to eliminate the reservations and steer Native Americans into mainstream U.S. culture. In July 2000 the Washington state Republican Party adopted a resolution of termination for tribal governments. As of 2004, there are still claims of theft of Native American land for the coal and uranium it contains.

In the state of Virginia, Native Americans face a unique problem. Virginia has no federally recognized tribes, largely due to Walter Ashby Plecker. In 1912, Plecker became the first registrar of the state's

Bureau of Vital Statistics, serving until 1946. Plecker believed that the state's Native Americans had been "mongrelized" with its African American population. A law passed by the state's General Assembly recognized only two races, "white" and "colored". Plecker pressured local governments into reclassifying all Native Americans in the state as "colored", leading to the destruction of records on the state's Native American community.

In order to receive federal recognition and the benefits it confers, tribes must prove their continuous existence since 1900. The federal government has so far refused to bend on this bureaucratic requirement. A bill currently before U.S. Congress to ease this requirement has been favorably reported out of a key Senate committee, being supported by both of Virginia's senators, George Allen and John Warner, but faces opposition in the House from Representative Virgil Goode, who has expressed concerns that federal recognition could open the door to gambling in the state.[38]

In the early 21st century, Native American communities remain an enduring fixture on the United States landscape, in the American economy, and in the lives of Native Americans. Communities have consistently formed governments that administer services like firefighting, natural resource management, and law enforcement. Most Native American communities have established court systems to adjudicate matters related to local ordinances, and most also look to various forms of moral and social authority vested in traditional affiliations within the community. To address the housing needs of Native Americans, Congress passed the Native American Housing and Self Determination Act (NAHASDA) in 1996. This legislation replaced public housing, and other 1937 Housing Act programs directed towards Indian Housing Authorities, with a block grant program directed towards Tribes.

Gambling has become a leading industry. Casinos operated by many Native American governments in the United States are creating a stream of gambling revenue that some communities are beginning to use as leverage to build diversified economies. Native American communities have waged and prevailed in legal battles to assure recognition of rights to self-determination and to use of natural resources. Some of those rights, known as treaty rights are enumerated in early treaties signed with the young United States government. Tribal sovereignty has become a cornerstone of American jurisprudence, and at least on the surface, in national legislative policies. Although many Native American tribes have casinos, they are a source of conflict. Most tribes, especially small ones such as the Winnemem Wintu of Redding, California, feel that casinos and their proceeds destroy culture from the inside out. These tribes refuse to participate in the gaming industry.

On May 19, 2005, the Massachusetts legislature finally repealed a disused 330 year-old law that barred Native Americans from entering Boston.

Africa

The indigenous peoples of Africa are those peoples from the African region whose way of life, attachment or claims to particular lands, and social and political standing in relation to other more dominant groups have resulted in their substantial marginalization within modern African states. This marginalization, combined with the desire to recognize and protect both their collective and human rights, and to maintain the continuity of their individual cultures has led many of these peoples to seek identification as indigenous peoples, in the contemporary global sense of the term.

In the post-colonial period, the concept of specific indigenous peoples within the African continent has gained wider acceptance, although not without controversy. The highly-diverse and numerous ethnic groups which comprise most modern, independent African states contain within them various peoples whose situation, cultures and pastoralist or hunter-gatherer lifestyles are generally marginalised and set apart from the dominant political and economic structures of the nation. Since the late 20th century these peoples have increasingly sought recognition of their rights as distinct indigenous peoples, in both national and international contexts.

Although the vast majority of African peoples can be considered to be "indigenous" in the sense that they have originated from that continent and nowhere else, in practice identity as an "indigenous people" as

per the term's modern application is more restrictive, and certainly not every African ethnic group claims identification under these terms. Groups and communities who do claim this recognition are those who by a variety of historical and environmental circumstances have been placed outside of the dominant state systems, and whose traditional practices and land claims often come into conflict with the objectives and policies promulgated by governments, companies and surrounding dominant societies.

Given the extensive and complicated history of human migration within Africa, being the "first peoples in a land" is not a necessary pre-condition for acceptance as an indigenous people. Rather, indigenous identity relates more to a set of characteristics and practices than priority of arrival. For example, several populations of nomadic peoples such as the Tuareg of the Sahara and Sahel regions now inhabit areas in which they arrived comparatively recently; their claim to indigenous status (endorsed by the African Commission on Human and Peoples' Rights) is based on their marginalisation as nomadic peoples in states and territories dominated by sedentary agricultural peoples.

The Indigenous Peoples of Africa Co-ordinating Committee (IPACC) is one of the main trans-national network organizations recognised as a representative of African indigenous peoples in dialogues with governments and bodies such as the UN. IPACC identifies several key characteristics associated with indigenous claims in Africa:

- Political and economic marginalization rooted in colonialism;
- De facto discrimination based often on the dominance of agricultural peoples in the State system (e.g. lack of access to education and health care by hunters and herders);
- The particularities of culture, identity, economy and territoriality that link hunting and herding peoples to their home environments in deserts and forests (e.g. nomadism, diet, knowledge systems);
- Some indigenous peoples, such as the San and Pygmy peoples are physically distinct, which makes them subject to specific forms of discrimination.

With respect to concerns expressed that identifying some groups and not others as indigenous is in itself discriminatory, IPACC states that it:

* "...recognizes that all Africans should enjoy equal rights and respect. All of Africa's diversity is to be valued. Particular communities, due to historical and environmental circumstances, have found themselves outside the state-system and underrepresented in governance...This is not to deny other Africans their status; it is to emphasize that affirmative recognition is necessary for hunter-gatherers and herding peoples to ensure their survival."

At an African inter-governmental level, the examination of indigenous rights and concerns is pursued by a sub-commission established under the African Commission on Human and Peoples' Rights (ACHPR), sponsored by the African Union (AU) (successor body to the Organization of African Unity (OAU)). In late 2003 the 53 signatory states of the ACHPR adopted the Report of the African Commission's Working Group on Indigenous Populations/Communities and its recommendations. This report says in part (p. 62):

* ...Certain marginalized groups are discriminated in particular ways because of their particular culture, mode of production and marginalized position within the state[; a] form of discrimination that other groups within the state do not suffer from. The call of these marginalized groups to protection of their rights is a legitimate call to alleviate this particular form of discrimination.

The adoption of this report at least notionally subscribed the signatories to the concepts and aims of furthering the identity and rights of African indigenous peoples. The extent to which individual states are mobilizing to put these recommendations into practice varies enormously, however, and most indigenous groups continue to agitate for improvements in the areas of land rights, use of natural resources, protection of environment and culture, political recognition and freedom from discrimination.

African Nationalism is a nationalist political movement for one unified Africa, or the less significant objective of the acknowledgment of African tribes by instituting their own states; as well as the safeguarding of their indigenous customs. Establishments, which championed the cause, included the Aborigines' Rights Protection Society in the Gold Coast (founded 1897), the African National Congress in South Africa (1912) and the National Congress of West Africa (1920).

Africa is a vast continent, amounting to nearly 30,000,000 square kilometers; indeed, it is as large as the USA, Europe, India and China all put together. Its diverse population is fast closing in on 1,000,000,000, with Berbers and other traditionally nomadic peoples, Arabs (who live in the North) and Bantu in the central and southern regions not to mention some smaller groups, helping to make up this massive number. There are about 8,000,000 Europeans and Asians. Ninety per cent of the population lives off agriculture- although there are a few areas that have been industrialized, most obviously in South Africa, which may be said to be the only properly-industrialized African state.

Africa's boundaries enclose hundreds of tribes, most of which have different languages, religions -- there are, among many others, the Muslims, Christians and animists --, traditions, economies, clothing, hut-construction, farming methods and means of livelihood (settled, nomadic, pastoral or agricultural). In Nigeria, the largest country in the continent, there are some 100 tribes, 248, all three of the religions mentioned above (in parenthesis) and individual economies. There is no doubt that one of Africa's most patent characteristics is its diversity -- which accounts for its extreme volatility.

Not so long ago, Africa was known as the "Dark Continent". This was because of its size, its deserts, its tropical climate, its unnavigable rivers, its lack of harbours and the hue of its people. There was also the problem of tropical illnesses such as malaria, yellow fever and sleeping sicknesses, all of which acted as deterrents to European exploration. It definitely lived up well to its other title, the "Terra incognita".

In the latter half of the Nineteenth Century, however, German, French and British explorers made their respective ways deep into the previously-undiscovered interior, where they discovered Central African lakes the Niger, Nile and Congo. The memoirs of great explorers such as Stanley and Livingstone gradually brought Africa into the spotlight.

When the liberated slaves and other progenies of the Afro-American populace commenced their homecoming to the African continent, principally in the western part, many overseas-directed churches were deserted by a large amount of Africans, and, in their stead, self-sufficient and -governing churches of the Africans' own were set up. These often involved themselves in the battle against colonialism.

Between World War I and World War II, a strident howl for self-determination resonated deafeningly from the gorges of numerous mutinous groups in a growing number of African countries. By the time of World War II, almost every nation in Africa had his own pro-autonomy factions, and there were even a number of organizations which spread their weight over whole expanses of the continent. The National Congress of British West Africa was one such organization. The Atlantic Charter, from 1941, and the critical approach to colonialism by the USSR and USA] served only to fortify this expanding dogma.

In the years following World War II, African nationalism found itself significantly stirred by men like Kwame Nkrumah of Ghana and Nelson Mandela of South Africa.

The political, social and economic journeys of newly independent African states were (and are still) slow and arduous ones. There were some gains, however, such as control over their own affairs; there were also a few gains for the ordinary African, who now had more access to information and was free from European enslavement. On the whole, though, the difficulties and challenges outweighed the benefits, especially politically and economically. Many African leaders found it incredibly difficult to cope, and their nations soon became one-party affairs.

Up Phases
 1780 - 1827
 1828 - 1919
 1920 - 1947
 1948 - ...

Movie notes
 pg 413

Anthropology Paper 02 - Volume 03

9.1 Tribal Administration

History of Administration of Tribal Areas

Pre-Independence Period: It was during the beginning of 19th century that the British government came in contact with the tribals for the first time. Their policy of administration was the isolation of tribals from general mass of the people. The separation of the tribal areas from purview of normal administration was the foremost policy of the British Raj. Prior to isolation, the tribals were over exploited by the non-tribals and now, because of this policy of segregation, very few people were allowed to enter the tribal areas. In fact, these people were not welcomed by the tribals.

An important part of the policy concerning tribal administration during British period was a deliberate attempt by the government not to increase any communication with tribal areas. Only a few roads were constructed for security purposes and for forest contractors. This isolation in fact eventually crystallized to a sense of separatist movements among tribals, especially those of North East India. Clewlands scheme of special administration of Rajmahal hills - Bengal in 1782 marks beginning of British Admin of Tribes. The National field considered this isolation as another instance of wicked conspiracy of new separatist minority - a policy of divide and rule. In an area-wise isolation started by Government of India Act 1870, few areas were identified as scheduled tracts like for example, Assam, Kumaon, Gharwal etc. In 1874, the Scheduled District Act gave effect to Government of India Act 1870. In the year 1919 certain districts were identified as "Backward tracts". This Act was based on the reforms suggested by Montague and Chelmsford. GoI Ad 1919 - identified (i) WEA (ii) AME appointment of special officers

In the Government of India Act, 1935, under sections 91 and 92, two areas were created - Excluded and Partially Excluded. The list of areas under each of these two categories was embodied in the Government of India order, 1936. There is a difference between the administrations of these two areas. In the excluded areas, the governor owns the discretion in tribal management and in partially excluded areas he seeks the advice of the council of ministers. The expenditure pertaining to excluded areas is non-votable, whereas the reverse being true for partially excluded areas. Any discussion on an excluded area in the legislature needs a prior permission from the Governor. In 1939, Elwin sought a national park for tribals to reduce contact with non-tribals to a minimum.

Development Efforts since Independence: Various planned efforts have been made since independence for economic development of the tribals. The first attempt was made in 1954 when 43 special multipurpose development projects, each with an additional outlay of Rs.27 lakhs for five years, were started to supplement the Community Development Programs which aimed at comprehensive development of rural areas. Since these projects were in the areas which comprised sparsely populated hill and forest regions, with poor communication and limited institutional infrastructure, they called for greater investment and personal attention by extension workers. The efforts, therefore, did not achieve the desired success.

The situation was reviewed in 1956 by Elwin Committee which recommended a cautious approach in the introduction of multiplicity of schemes in tribal areas. On review, the projects were substituted by a less intensive model of tribal development blocks in 1957. The area for a tribal development block was confined to an area of 150 to 200 sq. miles and a population of about 25000. The blocks were supposed to work for tribal population under intensive development program. They were to concentrate on four main activities, viz., economic development, education, health and communication and were to have specific targets.

The tribal development programs were subjected to comprehensive review by the Scheduled Areas and Scheduled Tribes Commission, generally called Dhebar Commission, in April 1960 and it submitted its report in October 1961. The Commission noted that the pace of development in the tribal areas was slow. Investment and other protective measures were also inadequate and needed urgent attention of the Government. It called for comprehensive legislation to cover all tribals living within the Scheduled Areas and outside, and a simple administrative system for tribal areas. It recommended a scheme of tribal

3(c) (x) development blocks for all areas with more than 50 per cent tribal population.

The recommendations of the Commission were accepted and the block approach was continued. By the end of Third Five Year Plan, the scheme was implemented in about 500 blocks covering about 40 percent of the total tribal population. It precluded a large section of the tribal population from the development programs. The tribal situation, so far as protective measures and developmental programs are concerned, remained almost unchanged. In 1969, a Committee under the Chairmanship of Shilu Ao was appointed to review the tribal development programs. It observed that most of the recommendations of the Dhebar Commission had remained unimplemented and urged that they should be implemented without any further delay. It disapproved the block approach as inadequate. The block was too small to function effectively as a basic unit of planning and implementation. It pointed out that the main problems of the tribals related to indebtedness, land alienation, economic backwardness and inadequacy of communication and suggested that those should be tackled on priority basis by formulating a comprehensive program of development.

5 During the Fourth Plan, six tribal development agencies were started as pilot schemes in four states, viz., two in Madhya Pradesh, two in Orissa and one each in Bihar and Andhra Pradesh. Subsequently, two more agencies were started in Orissa by the end of the Fourth Plan. Each agency covered a group of blocks and was expected to take up various programs and protective measures on integrated basis by pooling up the resources. In the Fourth Plan, about Rs.44 crores were allotted to these agencies. The allocations were in addition to the normal outlays. In actual practice, however, the agency approach practically remained an agricultural development program and failed to achieve the desired results. This approach was not extended to other areas and the blocks continued to be the unit of development.

TRIBAL SUB-PLAN

Background

The tribal situation was again reviewed on the eve of the Fifth Five Year Plan by a task force on "Development of Tribal Areas" constituted by the Planning Commission. It opined that the deficiencies and shortcomings pointed out by the earlier Commissions and Committees had generally remained unattended. It observed that one of the important factors for the failure of the development programs is that the Scheduled Tribes and tribal areas have been looked upon as a "welfare" problem as distinguished from "development" problem. The welfare of Scheduled Tribes has continued to depend on small outlays under the backward classes sector and not on general sector outlays. The administrative structure in tribal areas lacks simplicity. It is beyond the comprehension of the Tribals and therefore it does not evoke any response from them. Such a structure of administration may not therefore be suitable for carrying out integrated development of tribal areas. The Task Force recommended that to ensure balanced socio-economic development of the tribal areas, a policy of integrated development would be necessary for the Fifth and subsequent Plans. Therefore a Tribal Sub-Plan strategy was evolved in 1974-75. This strategy emphasized area development with a focus on improving the quality of life of the tribal communities. Its immediate objectives were elimination of exploitation in all forms, speeding up the process of social and economic development, building up inner strength of people and improving their organizational capabilities. It observed that any developmental activity for benefiting the tribal population will not succeed unless exploitation in various forms is prevented. For protecting the tribals from exploitation, it recommended integrated credit-cum-marketing service, marketing of agricultural and minor forest produce, supply of inputs and essential consumer commodities, credit for production purposes, consumption of social needs, redemption of past debts through legislative and executive measures and adoption of suitable measures for dealing with resultant liability. It also emphasized that the programs for prevention of land alienation, restoration of land already alienated, termination of practices like bonded labour, solution of the problems created in the zones of influence of modern industrialized areas and review of excise and forest policies needed special attention.

Strategy of TSP

For development of tribal economy, the Tribal Sub-Plan strategy recommended giving high priority to agriculture, land reforms, irrigation, improved methods of cultivation and completion of land records; special attention to vulnerable groups like shifting cultivators and forest villagers; generation of employment opportunities for better utilization of available manpower through programs in the fields of

horticulture, animal husbandry and allied occupations; development of cottage industries based on the local raw materials so that the proportion of semi-processed and processed goods is maximized in the export mix of the region and development of basic infrastructure including legal, institutional and physical aspects for speeding up the socio-economic development.

- 6 While preparing the Tribal Sub-Plan, which aimed at area development with a focus on tribal families, a thorough review of tribal problems was made, this included:

1. Identification and demarcation of areas of tribal concentration;
2. Identification of socio-cultural barriers and promoters of change in development;
3. Assessment of potentialities, special problems and felt-needs of the tribal areas;
4. Assessment of the resources available for the Sub-Plan;
5. Formulation of sectoral programs and
6. Devising suitable administrative set-up.

Areas of Tribal Sub-Plan:

→ TSP → ~~details & suggested by SC-Dube~~ first

22

- (a) The Tribal Sub-Plan approach has been applied to certain identified areas in 17 States and two Union Territories. These are Andhra Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Orissa, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal, Andaman & Nicobar Islands and Daman & Diu. This approach has not been applied to four tribal majority states of Arunachal Pradesh, Mizoram, Meghalaya and Nagaland and two Union Territories of Lakshadweep and Dadra and Nagar Haveli as their entire plans are directed towards the development and welfare of the tribal population.

- 2 The main components of the Tribal Sub-Plan strategy are Integrated Tribal Development Projects (ITDPs), Pockets and Primitive Tribal Group Projects. For implementation of Tribal Sub-Plan strategy, 191 Integrated Tribal Development Projects have been carved out in the aforesaid States and Union Territories. Each ITDP comprises blocks / Taluks / Tehsils or even whole district with 50 per cent or more tribal population. In delineating the project areas, the main factors viz., predominance of tribal population, contiguity of area and administrative viability have been kept in view. In certain States like West Bengal, Karnataka, Kerala and Tamil Nadu, where concentration of tribal population is not in contiguous belts, a flexible approach has been adopted in delineating ITDP areas. About 285 Modified Area Development Approach (MADA) pockets have also been carved out in 9 states, covering about 50 lakh tribal populations. These areas comprise smaller pockets of tribal concentration having minimum total population of 10000 with Scheduled Tribe population of 50 per cent or more. In these areas, the emphasis is on family development by taking up family-oriented income generating programs. By the end of the Sixth Plan, the Tribal Sub-Plan approach covered about 75 per cent of the total tribal population in the seventeen States and two Union Territories to which it was applicable.

It was later decided to extend the benefits of Tribal Sub-Plan strategy to the remaining 25 per cent dispersed tribal population in various states. Thus, 100 per cent tribal population has been brought within the fold of Tribal Sub-Plan. Economic assistance to families living below the poverty line is also being continued during the 7th Plan. During the Sixth Plan about 39 lakh tribal families were economically assisted against the target of about 28 lakh families. During the 7th Plan, the target of providing economic assistance has been fixed at 41.56 lakh families. During the first four years of the Seventh Plan, about 42.58 lakh families have already been assisted. The quantum of assistance varies from program to program and is not sufficient enough to raise the family above the poverty line.

- (c) Keeping in view the precarious condition of certain tribal communities and groups who are still in the primitive stages of economy and need special care both at the planning and implementation of program stages, 74 primitive tribes have been identified in 14 States and Union Territories. They constitute about

update!

- Under TSP, SC/SP strategies plan, funds are to be earmarked for SCs & STs under separate budget heads for each ministry

Issues - reporting is not being undertaken by all min/depts. (Yojana-Jan-2014)
- several min/depts remain out of ambit of SCSP/FSP.

- Allocations have not met the stipulated requirements.
- SCSP/FSP funds are used for very general purposes. Anthropology Paper 02 - Volume 03

13 lakhs of the tribal population. For these groups, special Micro Projects have been formulated.

3 Financial Resources and Outlays:

The Tribal Sub-Plan is being financed through the resources drawn from:

1. Flow of funds from State Plan outlays;
2. sectoral outlays in the Central Ministries for tribal areas;
3. Special Central Assistance allocation for tribal areas; and
4. Institutional finance mainly from banks.

Flow of funds from the State Plan to the Sub-Plan form the ^{major} resource base for the tribal development programs and the outlays from other sources are supplementary. The quantum of the outlays in the State Plan for the purpose is arrived at keeping in view:

- i) The total population,
- ii) The geographical area,
- iii) The comparative level of development, and
- iv) The state of social services.

The State Plan outlays comprise a divisible and a non-divisible portion. Those investments whose benefits do not confine to any specific region constitute the non-divisible portion. Quantification and utilization of resources should be reviewed to ensure accrual of due benefit to the tribal region. For the disbursement of funds within the divisible portion, a weightage should be given to the tribal areas on the basis of their level of social and economic development. The institutional finance should take into consideration the total ceiling for the State and special problems, if any, in inducing its flow to the tribal region. The likely flow of benefits from each program to the tribal areas should be quantified. The special central assistance for the Tribal Sub-Plan should attempt to supplement the total resources which can be mobilized by the State Plans, Central Ministries and the financing institutions.

Critique
TSP

After introduction of Sub-Plan strategy there has been substantial increase in flow of funds to Tribal Sub-Plan areas. But most of the funds have remained notional and as a result commensurate benefits could not accrue to tribal areas and tribal communities. For instance, investments made on major and medium irrigation, power, industrial and other projects merely on location basis accounted for about 50-60 per cent of the Tribal Sub-Plan. It has been shown as an investment under Tribal Sub-Plan but the proportionate benefits have not accrued to the tribals. In fact, such projects have benefited mainly the non-tribals. In individual sectors the flow of funds from State Plan to Tribal Sub-Plan has also been notional. Even in divisible sectors, allocation has been made on sectoral basis for the State as a whole and not for individual Integrated Tribal Development Projects. It has rendered the monitoring of physical benefits to Scheduled Tribes virtually impractical.

Special Central Assistance Funds have not been utilized as gap filler against specific schemes to supplement the efforts of the State Governments. The disaggregation of these funds is made sector-wise and not ITDP-wise by the State Departments of Planning and Finance. The Project Officer of the ITDP does not exercise any control over such funds. Thus it becomes difficult to monitor its utilization in the family oriented schemes.

Centrally Sponsored Schemes:

Division of responsibility between the Union and State governments is an important aspect of the centrally sponsored schemes in the development of the Scheduled Tribes. Each Central Ministry and Department is a nodal ministry or department concerning its sector. In the Ministry of Welfare there are

some schemes common to both Scheduled Castes and Scheduled Tribes, such as award of post-matric scholarships, coaching and allied facilities like pre-examination training centres and educational facilities like book banks, etc. A separate provision for Scheduled Tribes has also been made under three schemes namely, girls hostels, research and training and aid to voluntary organizations. The construction of boys' hostels has also been taken up under the centrally sponsored schemes since 1988-89.

Critical Appraisal of Tribal Sub-Plan:

Start from back page

The Tribal Sub-Plan strategy is in operation since the Fifth Five Year Plan, but it has not been able to bring about any perceptible improvement in the situation in tribal areas. It has remained a mere conglomeration of sectoral schemes under the State Plan. The general schemes and programs under the State Plan have been applied to tribal areas some of which do not cater to the needs and aspirations of the local people. The sectoral flow of funds for the Tribal Sub Plan has not been able to solve the problem of imbalance in the investments in tribal areas. In the absence of area specific programs, it is difficult to identify the physical achievements of investments. The basic information about the infrastructure development relating to health, education, drinking water, sanitation, communication, agriculture productivity, horticulture, industries etc. in respect of all tribal areas has not yet been tabulated. Such information is basic to a planned strategy for development of the tribal areas within a time frame.

Integrated Tribal Development Projects (ITDPs) were devised as a viable administrative units for accelerating the balanced development of the tribal areas. Each ITDP is headed by a senior officer but he has hardly any role to play either as an agent of development or as a co-ordinator. There is no uniformity in administrative pattern so far as Tribal Sub-Plan areas are concerned. In some states the ITDP is a subordinate organization to District Rural Development Agency (DRDA). In some states no distinct ITDP administrative set up has been evolved. The Union Government i.e., the Ministry of Home Affairs and now the Ministry of Welfare has adopted a persuasive approach for execution of the Tribal Sub-Plan strategy to achieve the desired results.

In order to ensure rapid development of the tribal areas and to improve the quality of life of the Scheduled Tribes the following suggestions merit consideration:

- Ex-A Ps*
- Instead of Tribal Sub-Plan, a separate plan for the tribal areas in each state (already identified as ITDPs, MADA, etc.) should be formulated. It would amount to delinking of the Tribal Sub-Plan from the States Plan and may be termed as Tribal Area Plan.
 - Separate allocation of funds should be made for the Tribal Plans. This could be done by the Planning Commission itself at the time of annual allocation of funds, keeping in view the population, geographical area and backwardness, and need not be left to the discretion of respective State Governments as under the existing system. On the basis of the allocation of funds, area specific and people specific Tribal Plans may be formulated.
 - In each ITDP, single line administration has to be introduced for execution of the schemes and programs. At the State level Tribal Welfare Department should be made a nodal Department for implementation and coordination of ITDP schemes and programs.
 - For the Centrally Sponsored Schemes the concerned Central Ministries or Departments should allocate funds under a separate budget sub-head of tribal areas. The funds should meet the entire outlay of the schemes. The schemes have to be carefully identified keeping in view the local needs to the tribals. In order to ensure strict enforcement of policy and programs in respect of tribal areas, it should be clearly laid down as a policy that the Planning Commission should not approve the Plan of the Ministry concerned unless and until specific provision for the development of Scheduled Tribes has been made. Annual Central Plan for tribal areas may also be formulated by pooling up resources which may incorporate the schemes sponsored by various Ministries and Departments. The Ministry of Welfare which is the nodal Ministry for policy, planning and coordination of all tribal matters may be assigned the task of formulating the Central Tribal Area Plan. It would enable it to have a total view of the efforts made by various Ministries and Departments. The progress of implementation and

achievements of all the centrally sponsored schemes may be annually reviewed by the Planning Commission. There should also be a separate monitoring cell in each Ministry and Department.

The tribals have been treated as mere receivers of the benefits and they have not been involved either in the decision making process or in formulation or implementation of the plans and programs. As the problems of the tribals are unique, it is essential that they are actively involved in planning as well as in the implementation of the programs. Effective participation of the tribals in decision making would not only bring about successful implementation of the programs but also create confidence among them in the policies of the Government. Such an approach would make the planned efforts of the Government more meaningful.

ADMINISTRATIVE SET-UP FOR TRIBAL DEVELOPMENT

Till 1964, Ministry of Home was the overall in-charge of work pertaining to tribal welfare. In 1964, this was taken over by a new department called the Department of Social Security. The recommendation of separate department within the Home Ministry for Welfare was made by the Study Team on Social Welfare and Welfare of Backward Classes. This department of social security was also taking care of tribal welfare.

Under Article 339 of the constitution, the president appointed a Scheduled Areas and Scheduled Tribes Commission. This commission recommended a separate department in the Ministry of Home Affairs, exclusively for tribal welfare. This recommendation was made with a view to accelerate the tempo of tribal development in India. The dubbing of tribal welfare with that of Scheduled Castes and Backward Classes was not realistic. The problems of Scheduled castes are because of the pernicious social system of caste and backwardness created by it. Whereas, the problems of Scheduled Tribes is because of the condition created by geography. Hence, an altogether different approach is needed.

In 1964, the Department of Social Security was transferred to the Ministry of Law. In 1966, this department was reorganized and called Department of Social Welfare. A later development is the creation of a full fledged Directorate of Tribal Welfare under the Ministry of Home. For quite some time, the planning and implementation of the welfare measures of this department were taken care of by the commissioner for SC's and ST's. Later, this job was transferred to the newly created Directorate for Tribal Welfare. This office had a Director General at the center with five Zonal Officers with a Zonal Director as its head. This was done to ensure a rapid implementation of the welfare measures.

The office of the commissioner for SCs and STs has a special significance because it acts as a link between the constitution and the governments, both state and union, on one hand and on the other, it is the medium through which the Union Government and the Parliament are kept informed of the programs and implementation regarding SCs and STs. Apart from the Ministry of Social Welfare, other Ministries like Home, Education, Food and Agriculture and also the Planning Commission at the Central level are evolved in the tribal administration.

At the State level, the Ministry of Tribal Welfare is created in some States. The Governor is an overall in-charge/to oversee the development programs. The District Collector, the Project Officer of ITDA and Social Welfare Officers and Village Panchayats are involved in tribal development in India. Various ministries and in fact the whole structure of tribal administration is assisted by various Tribal Research Institutes in tribal planning.

PROGRAMS FOR DEVELOPMENT OF SCHEDULED TRIBES

The Ministry of Tribal Affairs was constituted in October 1999 to provide more focused attention towards development of Scheduled Tribes. Carved out of the Ministry of Social Justice and Empowerment, the Ministry of Tribal Affairs is the nodal Ministry for overall policy, planning and coordination of programs and schemes for the development of Scheduled Tribes.

A majority of Scheduled Tribes continues to live below the poverty line have poor literacy rates, suffer

from malnutrition and disease and is vulnerable to displacement. In general, populations in remote and low-density areas do not have adequate access to affordable health care services, coupled with high infant, child, and maternal mortality. In other words, they remain one of the major under-served population groups in the coverage of reproductive and child health services.

A plethora of campaigns to promote education over since Independence have failed to close the disparity in the literacy rate among Scheduled Tribes hovering around 29 per cent as against the national rate of 52 per cent (1991 Census). The ST female literacy rate is only 18 per cent compared to the national female literacy rate of 39 per cent. Alienation from the society, lack of adequate infrastructure like schools, hostels and teachers, abject poverty and apathy towards irrelevant curriculum have stood in the way of tribes people getting formal education.

Proportion and number of tribal people in the states vary greatly. While some of the States have as high as 95 per cent of its population as tribal (Mizoram), there is none in Punjab, Haryana and UT of Chandigarh. Under Tribal Sub-plan, the tribal areas in the country have been delineated. There are now 194 integrated tribal development projects/agencies (ITDPs/ITDAs) in the country in which lives more than 50 per cent of the total ST population of the country. During the Sixth Plan, pockets outside ITDP areas, having a total population of 10,000 with at least 5,000 scheduled tribes were covered under the Tribal Sub-Plan under Modified Area Development Approach (MADA). So far, 252 MADA pockets have been identified in the country. In addition, 79 clusters with a total population of 5,000 having 50 per cent scheduled tribes have been identified. There are 50 districts in the country where tribal people constitute 20 per cent or more of the total population.

The tribal people of India, who come under the category of 'Scheduled Tribes' (STs) in terms of the provisions of the Constitution of India, number 8.43 crore—constituting 8.2 per cent of the population of the country. (Census 2001).

Scheduled Areas and Tribal Areas: Scheduled Tribes live in contiguous areas unlike other communities.

It is, therefore, much simpler to have an area-approach for development activities and also regulatory provisions to protect their interests. In order to protect the interests of Scheduled Tribes with regard to land alienation and other social factors, provisions of "Fifth Schedule" and "Sixth Schedule" have been enshrined in the Constitution.

The Fifth Schedule under Article 244(1) of Constitution defines "Scheduled Areas" as such areas as the President may by Order declare to be Scheduled Areas after consultation with the Governor of the State.

The Sixth Schedule under Article 244 (2) of the Constitution relates to those areas in the States of Assam, Meghalaya, Tripura and Mizoram which are declared as "Tribal Areas" and provides for District Councils and/or Regional Councils for such Areas. These Councils have been conferred with wide ranging legislative, judicial and executive powers.

The Fifth Schedule Areas: The criteria for declaring any area as a "Scheduled Area" under the Fifth Schedule are: (a) Preponderance of tribal population, (b) Compactness and reasonable size of the area, (c) A viable administrative entity such as a district, block or taluk, and (d) Economic backwardness of the area as compared to neighboring areas.

The specification of "Scheduled Areas" in relation to a State is by a notified Order of the President, after consultation with the State Governments concerned. The same applies for altering, increasing, decreasing, incorporating new areas, or rescinding any Orders relating to "Scheduled Areas".

Criterias given by the Govt of India

The advantages of Scheduled Areas are that: (a) The Governor of a state, which has Scheduled Areas, is empowered to make regulations in respect of the following: (1) Prohibit or restrict transfer of land from tribal people; (2) Regulate the business of money lending to the members of Scheduled Tribes. In making any such regulation, the Governor may repeal or amend any Act of Parliament or of the Legislature of the State, which is applicable to the area in question. (b) The Governor may by public notification direct that any particular Act of Parliament or of the Legislature of the State, shall not apply to a Scheduled Area or

any part thereof in the State or shall apply to such area subject to such exceptions and modifications as he may specify. (c) The Governor of a State having Scheduled Areas therein, shall annually, or whenever so required by the President of India, make a report to the President regarding the administration of the Scheduled Areas in that State and the executive power of the Union shall extend to the giving of directions to the State as to the administration of the said area. (d) Tribes Advisory Council (TAC) shall be established in States having Scheduled Areas. The role of TAC is to advise the State Government on matters pertaining to the welfare and advancement of the Scheduled Tribes in the State as may be referred to it by the Governor. The TAC will consist of not more than twenty members of whom about 3/4 are from ST-MLAs. (The TAC may also be established in any State having Scheduled Tribes but not Scheduled Areas on the direction of the President of India) (e) The Provisions of the Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA), vide which the provisions of Panchayats, contained in Part IX of the Constitution, were extended to Scheduled Areas, also contain special provisions for the benefit of Scheduled Tribes.

The Sixth Schedule - Tribal Areas: The Sixth Schedule under Article 244 of the Constitution identifies Autonomous districts in the Tribal Areas in the states of Assam, Meghalaya, Tripura and Mizoram. It also makes provisions for recognition of Autonomous Regions within these Autonomous Districts. These have been specified in Parts I, II, II A & III of the table appended to paragraph 20 of the Sixth Schedule. In other words, areas where provisions of Sixth Schedule are applicable are known as Tribal Areas. The State-wise details of Tribal Areas are as under:

Part I	Assam	1. The North Cachar Hills District 2. The Karbi-Anglong District 3. The Bodo Land Territorial Area Districts	→ renamed Dimasa Autonomous Territorial Council
Part II	Meghalaya	1. Khasi Hills District 2. Jaintia Hills District 3. The Garo Hills District	
Part II A	Tripura	Tripura Tribal Area District	
Part III	Mizoram	1. The Chakma District 2. The Mara District 3. The Lai District	

The administration of Autonomous Districts and Autonomous Regions is done through District Councils/Regional Councils. These Councils are elected bodies and have powers of legislation, administration of justice apart from executive, developmental and financial responsibilities. The District or Regional Councils are empowered to make rules with the approval of the Governor with regard to matters like establishment, construction or management of primary schools, dispensaries, markets, cattle ponds, ferries, fisheries, roads, road transport and water-ways in the district.

 The Autonomous Councils of the North Cachar Hills and Karbi Anglong have been granted additional powers to make laws with respect to other matters like secondary education, agriculture, social security and social insurance, public health and sanitation, minor irrigation, etc.

The Councils have also been conferred powers ^{by the Governor} under the Civil Procedure Code and Criminal Procedure Code for trial of certain suits and offences, as also the powers of a revenue authority for their area for collection of revenue and taxes and other powers for the regulation and management of natural resources.

PROCEDURE FOR DECLARATION AS ST

The term "Scheduled Tribes" is defined in the Constitution of India under Article 366(25) as "such tribes or tribal communities or parts of groups within such tribes or tribal communities as are deemed under Article 342 to be Scheduled Tribes for the purposes of this Constitution". Article 342 prescribes the procedure to be followed in the matter of specification of Scheduled Tribes.

In terms of Article 342(1), the President may, with respect to any State or Union Territory, and where it is State, after consultation with the Governor thereof, notify tribes or tribal communities or parts thereof as Scheduled Tribes. This confers on the tribe or part of it a Constitutional status invoking the safeguards provided for in the Constitution, to these communities in their respective States/UTs.

Thus, in terms of Article 342(1), only those communities who have been declared as such by the President through an initial public notification will be considered as Scheduled Tribes. Any further amendment in the list is to be done through an Act of Parliament [Article 342(2)]. Parliament may, by law, include in or exclude from the list of Scheduled Tribes, any tribe or tribal community or parts of thereof.

It is also worth noting that the above Article also provides for listing of Scheduled Tribes State-wise/Union Territory-wise and not on an all-India basis. Thus the list of Scheduled Tribes is State-specific. In other words, a community declared as Scheduled Tribe in one State need not be so in another State.

SCHEDULING AND DE-SCHEDULING OF TRIBES

Thus, the first specification of Scheduled Tribes in relation to a particular State/ Union Territory is by a notified order of the President, after consultation with the State Governments concerned. The above Article also provides for listing of Scheduled Tribes State-wise/UT-wise and not on an all-India basis. The orders can be modified subsequently only through an Act of Parliament.

The criteria generally adopted for specification of a community as a Scheduled Tribe are: (1) indications of primitive traits; (b) distinctive culture; (c) shyness of contact with the community at large; (d) geographical isolation i.e. backwardness.

These are not spelt out in the Constitution but have become well established. They take into account the definitions in the 1931 Census, the reports of the first Backward Classes Commission (Kalelkar) 1955, the Advisory Committee on Revision of SC/ ST lists (Lokur Committee) 1965 and the Joint Committee of Parliament on the Scheduled Castes and Scheduled Tribes Orders (Amendment) Bill, 1967 (Chanda Committee) 1969.

There are over 600 tribes (with many of them overlapping in more than one State) as notified under Article 342 of the Constitution of India, spread over different States and Union Territories of the country. It is worth noting that no community has been specified as a Scheduled tribe in relation to the States of Haryana and Punjab and the Union Territories of Chandigarh, Delhi and Pondicherry.

ASCERTAINING THE ST STATUS OF AN INDIVIDUAL

General

Where a person claims to belong to a Scheduled tribe by birth, it should be verified: (a) that the person and his parents actually belong to the community claimed; (b) that the community is included in the Presidential Order specifying the Scheduled Tribes in relation to the concerned State; (c) that the person belongs to that State and the area within that State in respect of which the community has been scheduled; (d) he may profess any religion; (e) that he or his parents/grandparents, etc., should be permanent resident of the State/UT on the date of notification of the Presidential Order applicable in his case; (f) a person who is temporarily away from his permanent place of residence at the time of the notification of the Presidential Order--applicable in his case, say for example to earn a living or seek education, etc. can also be regarded as a Scheduled Tribe, if his tribe has been specified in that order in

relation to his home State/Union Territory; (g) but he cannot be treated as such in relation to the place of his temporary residence notwithstanding the fact that the name of his tribe has been scheduled in respect of that State where he is temporarily settled, in any Presidential Order; (h) in the case of persons born after the date of notification of the relevant Presidential

Order, the place of residence for the purpose of acquiring Scheduled Tribe status, is the place of permanent abode of their parents at the time of the notification of the Presidential Order under which they claim to belong to such a tribe. This does not apply to the STs of the Lakshadweep Islands for whom there is a requirement of being born in the U.T. in order to be eligible for ST status.

Scheduled Tribe claims on migration

1. Where a person migrates from the portion of the State in which his/her community is scheduled, to another part of the same State in respect of which his/her community is not scheduled, the person will continue to be deemed to be a member of the Scheduled Tribe, in relation to that State
2. Where a person migrates from one State to another, he can claim to belong to a Scheduled Tribe only in relation to the State to which he originally belonged and not in respect of the State to which he has migrated.

Schedule Tribe Claims Through Marriages

The guiding principle is that no person who is not a Scheduled Tribe by birth will be deemed to be a member of Scheduled Tribe merely because he or she has married a person belonging to a Scheduled Tribe. Similarly a person who is a member of a Scheduled Tribe will continue to be a member of that Scheduled Tribe, even after his or her marriage with a person who does not belong to a Scheduled Tribe.

Issue of Scheduled Tribe Certificates

The candidates belonging to Scheduled Tribes may get Scheduled Tribe certificates, in the prescribed form, from any one of the following authorities: (1) District Magistrate/Additional District Magistrate/Collector/Deputy Commissioner/ Additional Deputy Commissioner/Deputy Collector/1st Class Stipendiary Magistrate/City Magistrate/Sub Divisional Magistrate/Taluka Magistrate/Executive Magistrate/Extra Assistant Commissioner [not below the rank of 1st Class Stipendiary Magistrate]. (2) Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate. (3) Revenue Officers not below the rank of Tehsildar. (4) Sub-Divisional Officer of the Area where the candidate and/or his family normally resides. (5) Administrator/Secretary to the Administrator/ Development Officer [Lakshadweep Islands].

Punishments for officials issuing Scheduled Tribes Certificates without proper verification

Action is to be taken under the relevant provisions of the Indian Penal Code if any official is found to have issued a Scheduled tribe certificate carelessly and without proper verification. This will be in addition to other action to which they are liable under the appropriate disciplinary rules applicable to them.

Procedure for inclusion in or exclusion from the list of Scheduled Tribes

In June 1999, the Government approved modalities for deciding claims for inclusion in, or exclusion from, the lists of Scheduled Tribes. According to these approved guidelines, only those claims that have been agreed to by the concerned State Government, the Registrar General of India and the National Commission for Scheduled Castes and Scheduled Tribes will be taken up for consideration. Whenever representations are received in the Ministry for inclusion of any community in the list of Scheduled Tribes of a State/UT, the Ministry forwards that representation to the concerned State Government/UT Administration for recommendation as required under Article 342 of the Constitution. If the concerned State Government recommends the proposal, then the same is sent to the Registrar General of India (RGI). If RGI is satisfied with recommendation of the State Government and recommends the proposal to the Central Government, the Government refers the proposal to the National Commission for Scheduled

Tribes for their recommendation. If the National Commission for Scheduled Tribes also recommends the case, the matter is processed for the decision of the cabinet after consulting the concerned administrative Ministries. Thereafter the matter is put up before the Parliament in the form of a Bill to amend the Presidential Order.

GENERAL STATISTICS

According to the 2001 Census, the population of Scheduled tribes in the country was 8.43 crore - i.e., constituting 8.2 per cent of the total population of the country.

The Tribal communities live in about 15 per cent of the country's area, in varying ecological and geo-climatic conditions, plains, forests, hills and inaccessible areas. Tribal groups are at different stages of social, economic and educational development. They have their presence in the States and Union Territories except Haryana, Punjab, Chandigarh, Delhi and Pondicherry. The predominant tribal-populated States of the country (i.e., those with tribal population of more than 50 per cent of the total population of the State are: Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Union territories of Dadra & Nagar Haveli and Lakshadweep. If a comparison is made amongst ST population alone, more than half the ST population of the country is concentrated in the States of Madhya Pradesh, Chhattisgarh, Maharashtra, Orissa, Jharkhand and Gujarat. The largest number of tribes (i.e. 62) is in the State of Orissa. The next major concentration is in the North-Eastern States.

Criteria for PTG

Primitive Tribal Groups (PTGs): While some tribal communities have adopted a mainstream way of life at one of the spectrum, there are 75 Primitive Tribal Groups (PTGs) in 17 States and Union Territories of Andaman and Nicobar Islands, who are characterized by: (a) a pre-agriculture (level of technology) (b) a stagnant or declining population, (c) extremely low literacy, and (d) a subsistence level of economy. Their total population as per the 1991 census was about 24.12 lakh. Most of these groups are small in number, have attained various levels of social and economic progress and generally live in remote habitat, with poor administrative and infrastructure back up.

Population Profile: Many indicators in respect of Scheduled Tribes like their demography, sex-ratio, education, livelihood profile, health profile have been compiled periodically through the Census operations or by the National Sample Survey Organization (NSSO) or the Central Statistical Organization (CSO). The population of Scheduled Tribes has been on the increase since 1961. The census reveals that the tribal population had grown at the rate of 24.45 per cent during the period 1991-2001. The decadal population growth between the Census Year 1981 to 1991 in respect of the tribal population had been higher (31.64 per cent) than that for the overall population (23.51 per cent). However during census years 1991 to 2001 it had been 24.45 per cent against the growth rate of 22.66 per cent for the entire population.

As compared to the sex ratio for the overall population (933 females per 1000 male), the sex ratio among Scheduled Tribes is more favorable, at 978 females per 1,000 males (2001 census).

Literacy: The literacy rate for overall population has increased from 52.2 per cent to 65.38 per cent between 1991 to 2001. In case of Scheduled Tribes the increase in literacy has been from 29.62 per cent to 47.10 per cent. The literacy rate among tribals (47.10 per cent) is however far below the overall literacy in the country (64.8 per cent). The female literacy rate among tribals during the period 1991 to 2001 increased from 18.2 per cent to 34.8 per cent which is lower by approximately 20 per cent as compared to literacy rate of the females of the general population. However, the significant point is the increase in the total as well as the female literacy among tribals. These disparities are compounded by higher dropout rates in formal education, resulting in a disproportionately low representation in higher education.

Job profile: According to the 1991 Census figures, 42.02 per cent of the ST population was main workers, of whom 54.50 per cent were cultivators and 36.09 per cent agricultural laborers. Thus, about 82 per cent of the main workers from these

Indicators of Backwardness: Not surprisingly, the cumulative effect has been that the proportion of Scheduled Tribes below the poverty line is substantially higher than the national average. A majority of Scheduled Tribes continues to live below the poverty line, have poor literacy rates, suffer from malnutrition and diseases and are vulnerable to displacement.

The Central Government and the State Governments have been implementing schemes/programs for the upliftment of STs like reservation in Services, Tribal Sub-Plans, Central Schemes, Centrally Sponsored Schemes, etc. However, a lot more is required to be done to achieve the desired development goals for STs.

DEMOGRAPHIC STATISTICS : 2001 CENSUS

S. No.	India/State	Total population	ST Population	Percentage of STs to total population in the State
1	Mizoram	888,573	839,310	94.5
2	Lakshadweep	60,650	57,321	94.5
3	Nagaland	1,990,036	1,774,026	89.1
4	Meghalaya	2,318,822	1,992,862	85.9
5	Arunachal Pradesh	1,097,968	705,158	64.2
6	Dadra and Nagar Haveli	220,490	137,225	62.2
7	Manipur	2,166,788	741,141	34.2
8	Chhattisgarh	20,833,803	6,616,596	31.8
9	Tripura	3,199,203	993,426	31.1
10	Jharkhand	26,945,829	7,087,068	26.3
11	Orissa	36,804,660	8,145,081	22.1
12	Sikkim	540,851	111,405	20.6
13	Madhya Pradesh	60,348,023	12,233,474	20.3
14	Gujarat	50,671,017	7,481,160	14.8
15	Rajasthan	56,507,188	7,097,706	12.6
16	Assam	26,655,528	3,308,570	12.4
17	J&K	10,143,700	1,105,979	10.9
18	Maharashtra	96,878,627	8,577,276	8.9
19	Daman and Diu	158,204	13,997	8.8
20	Andaman and Nicobar	356,152	29,469	8.3
21	Andhra Pradesh	76,210,007	5,024,104	6.6
22	Karnataka	52,850,562	3,463,986	6.6
23	West Bengal	80,176,197	4,406,794	5.5
24	Himachal Pradesh	6,077,900	244,587	4.0
25	Uttarakhand	8,489,349	256,129	3.0
26	Kerala	31,841,374	364,189	1.1
27	Tamil Nadu	62,405,679	651,321	1.0
28	Bihar	82,998,509	758,351	0.9
29	Uttar Pradesh	166,197,921	107,963	0.1
30	Goa	1,347,668	566	0
31	Haryana	21,144,564	0	0
32	Punjab	24,358,999	0	0
33	Chandigarh	900,635	0	0
34	Delhi	13,850,507	0	0
35	Pondicherry	974,345	0	0
	India	1,028,610,328	84,326,240	8.2

SPECIAL CENTRAL ASSISTANCE

The innovative strategy of the Tribal Sub-Plan (TSP) for STs was launched during 1974. This special strategy was expected to ensure that all the general development sectors, both at the Central and State levels, earmark funds for STs in proportion to their population so that adequate benefits from all the concerned sectors flow to this disadvantaged group. In support of this special strategy the Government of India has also been extending Special Central Assistance (SCA) to the States and the UTs, as an additive to fill up the gaps, especially in the family based income-generating programs. As a result, there has been a substantial increase in the flow of funds for the development of STs besides enlargement of the share of benefits for STs under all the development programs.

Special Central Assistance is provided by the Ministry of Tribal Affairs to 21 Tribal Sub-Plan State Governments and two U.T. Administrations including North Eastern States of Assam, Manipur and Tripura. However, from 2003-04 the Ministry of Home Affairs is releasing the funds under SCA to TSP meant for the UTs. The SCA is to be utilized in conjunction with the TSP flow with a view to meeting the gaps, which are not otherwise taken care of by the State Plan. The objective and scope of SCA to TSP which was originally meant for filling up of the critical gaps in the family-based income-generation activities of the TSP, will now be expanded to cover the employment-cum-income generation activities and the infrastructure incidental thereto which may not only be family-based, but also run by the Self-Help Groups (SHGs)/Community. The ultimate objective of extending SCA to TSP is to boost the demand based income-generation programs and thus raise the economic and social status of tribals in sectors of agriculture, horticulture, land reforms, watershed development/soil and moisture conservation, animal husbandry, ecology and environment, development of forests/forest villages, development of entrepreneurship and SSI and tribal women. During 2003-04 an amount of Rs. 461.30 crore was released to the States/UTs.

GRANTS UNDER ARTICLE 275 (1)

The Constitution of India provides for assured special financial assistance under its Article 275 (1) for promoting the welfare of STs and for raising the level of administration of the Scheduled Areas to that of the rest of the State. The Ministry of Tribal Affairs releases grants to 21 Tribal Sub-Plan (TSP) and four Tribal majority States under First Proviso to Article 275 (1) of the Constitution to meet the cost of such projects for Tribal Development as may be undertaken by the State Government with the approval of Government of India, for raising the level of administration of the Scheduled Areas therein to that of the rest of the State. Funds are now being released against specific infrastructure projects like roads, bridges, solar electrification, construction of school, hostel building, irrigation facilities, etc. During 2003-04, Rs 252.70 crores has been provided to the States for infrastructure projects.

Since 1997-98, a part of funds under Article 275(1) of the Constitution is also released for setting up "Eklavya Model Residential Schools" to provide quality education to the tribal students. This will enable the tribal children to avail of the facility of reservation in higher and professional educational courses as well as in higher levels of jobs in the Government and Public Sector undertakings. An amount of Rs. 15.41 crore has been provided to the State Government for setting up of Eklavya Model Residential Schools during 2003-04.

SCHEME FOR PRIMITIVE TRIBAL GROUPS

Based on the pre-agricultural level of technology, low level of literacy, declining or stagnant population, 75 tribal communities in 15 States/UTs, have been identified and categorized as Primitive Tribal Groups. A Central Sector Scheme has been introduced for all-round development of these groups from 1998-99 under which financial assistance is made available to Integrated Tribal Development Projects, Tribal Research Institutes and Non-Governmental Organizations for undertaking projects/activities not covered by any of the existing schemes. Financial assistance to the tune of Rs 16.13 crore has been sanctioned under the scheme during 2003-04.

TRIBAL RESEARCH INSTITUTES

50:50 - States
100 - UT

- 1 There are fifteen Tribal Research Institutes (TRIs) one each in Andhra Pradesh, Assam, Bihar, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, West Bengal, Uttar Pradesh, Manipur, Tripura and Andaman and Nicobar Islands. The Ministry funded the establishment of the Tribal Research Institute at Port Blair, Andaman and Nicobar Islands, during 2002-03. These Institutes provide planning inputs to the State Governments, conduct research and evaluation studies, collect data, is involved in codifying of customary law and conduct training, seminars and workshops. Some of these Institutes also house museums for exhibiting tribal artifacts. During 2003-04, Rs. 2.53 crore was released to the State Governments/UT Administrations to support these Institutes.

HOSTELS FOR ST GIRLS AND BOYS

Tribal children are deprived of education as the hamlets and villages they reside in do not have such facilities. The Girls' hostels scheme was started in the Third Five Year Plan with the aim of providing residential facilities to tribal girls in pursuit of education away from home. Central assistance of 50 per cent cost of construction to the States and 100 per cent to the Union Territories is provided under the scheme. The Boys' Hostels scheme was started in 1989-90 under the same pattern as the Girls' Hostels. During 2003-04, an amount of Rs. 18.15 crore was released for construction of 298 boys' and 171 girls' hostels.

ASHRAM SCHOOLS IN TSP AREAS

This Centrally-sponsored scheme was started in 1990-91 to provide central assistance to the States and Union Territories on 50 per cent and 100 per cent basis respectively. During 2003-04, Rs. 6.47 crore was sanctioned and released for construction of 315 Ashram schools under the scheme.

VOCATIONAL TRAINING TO PROMOTE ENTREPRENEURSHIP

This scheme under the Central Sector, introduced in 1992-93, aims at developing the skills of the tribal youth in order to gain employment/self employment opportunities. The scheme envisages setting up of vocational training centres (VTCs). During 2003-04, an amount of Rs. 5.18 crore was released for 50 vocational training centres run by Non-Governmental Organizations and 150 vocational training centres run by State Governments.

EDUCATION OF GIRLS IN LOW LITERACY POCKETS

This Scheme was launched in 1993-94 with the objective of raising the literacy level of tribal females in 48 identified tribal districts in eight States with female literacy below two per cent. This scheme was revised in July 1998 and now covers 136 districts having female literacy of less than 10 per cent in 14 States. The scheme envisages setting up of residential educational complex as from first to fifth standard. The scheme is implemented through the voluntary organizations and State Governments/UTs. During 2003-04, an amount of Rs 5.73 crore was released for 183 complexes.

VILLAGE GRAIN BANK SCHEME

A Central Sector Scheme of Grain Banks in tribal villages was launched in 1996-97. The scheme was started on a pilot basis in selected areas out of the areas identified by CPC for preventive measures against deaths of children in remote and backward tribal areas by providing a safeguard against fall in nutritional standards of Scheduled Tribes living in remote rural areas. The Ministry releases the funds through the Tribal Cooperative Marketing Development Federation of India (TRIFED), which is the channelising agency under the scheme. An amount of Rs 1.07 crore was released during 2003-04 under the scheme. Since inception, 1,483 Grain Banks have been set up in the country. The existing Village Grain Bank is being revised with a broader coverage of endemic drought prone areas and tribal areas.

GRANTS-IN-AID TO VOLUNTARY ORGANISATIONS

The Ministry gives grant-in-aid to voluntary organizations working for the welfare of the scheduled tribes for projects like residential schools, hostels, medical units, computer training units, shorthand and typing training unit, balwadis/creches (in areas not covered by the ICDS program), Libraries and audio-visual units. The grant is generally restricted to 90 per cent of the approved total cost of the project -and the balance 10 per cent is borne by the grantee organizations. During 2003-04, an amount of Rs 26.46 crore was released to 288 NGOs for implementation of approximately 900 projects.

POST-MATRIC SCHOLARSHIPS

The scheme was introduced in 1944 for providing financial assistance to SC/ ST students pursuing post-matriculation recognized courses including professional, technical as well as non-professional and non-technical courses. The scheme is implemented by State Governments and UT administrations which receive 100 per cent financial assistance over and above the committed liability. Rs 64.30 crore were released during 2003-04 benefiting an estimated 27 lakh ST students so far.

OTHER EDUCATIONAL SCHEMES (National Overseas Scholarship Scheme)

The Ministry of Tribal Affairs is also the implementing agency in respect of National Overseas Scholarship for higher studies abroad, book bank, coaching and allied areas and upgradation of merit for the benefit of ST students.

GRANT-IN-AID FOR MINOR FOREST PRODUCE OPERATIONS

This central Sector Scheme makes cent per cent grants available to the State Tribal Development Cooperative Corporations (STDCCs), Forest Development Corporations (FDCs), and Minor Forest Product (Trading and Development) Federations (MFPTDFS) for taking up minor forest produce (MFP) operations, a mainstay in tribal economy. Under this scheme grants can be utilized by the States for (i) strengthening the share capital base of STDCCs for increasing the volume of procurement of MFPS; (ii) construction of scientific warehouses; (iii) establishing process industries for value addition to MFP items; and (iv) research and development activities by the Corporations. An amount of Rs 4.50 crore was released to different State Corporations during 2003-04.

AUTONOMOUS ORGANISATIONS

TRIBAL COOPERATIVE MARKETING DEVELOPMENT FEDERATION OF INDIA LIMITED

Tribal Cooperative Marketing Development Federation of India Limited (TRIFED) was set-up by the Government of India in 1987, with the Prime objective of providing marketing assistance and remunerative Prices to ST Communities for their minor forest produce and surplus agricultural produce and to wean them away from exploitative private traders and middlemen. The federation is a national level cooperative apex body.

NATIONAL SCHEDULED TRIBES FINANCE DEVELOPMENT CORPORATION

The Government of India set up the National Scheduled Tribes Finance Development Corporation (NSTFDC) in April 2001 by bifurcating the National Scheduled Castes and Scheduled Tribes Financial Development Corporation. NSTFDC is a Government of India undertaking with an authorized share capital of Rs 500 crore.

The Corporation extends financial assistance to Scheduled Tribes at concessional rate for income generating schemes costing up to 10 lakh per unit, provides grants for skill development program for STs and fill the critical gaps by providing backward and forward linkages for activities undertaken by the target group. Members of the Scheduled Tribes whose annual family income does not exceed double the poverty-line income limit, are eligible for financial assistance in the fields of agriculture and allied activities, manufacturing and service sector activities.

✓ A new scheme Adivasi Mahila Sashaktikaran Yojana has been introduced from the year 2002-03. Scheduled Tribe women below the poverty line are to be assisted for small economic activities to augment their income with a loan of up to Rs 50,000 at an interest rate of four per cent annum. This scheme is expected to benefit a large number of ST families living below the poverty line.

MAJOR ACHIEVEMENTS

The Ministry of Tribal Affairs has taken some key initiatives since its creation in 1999. A National Commission for Scheduled Areas and Scheduled Tribes was set-up as per provisions of Article 330 (1) of the Constitution of India to report on the administration of the Scheduled Areas and the welfare of the Scheduled Tribes in the States. This has been set-up after a gap of 40 years (Dhebar Commission, the first one, was set-up in 1961).

A separate National Commission for the Scheduled Tribes has been set- up with five Members by bifurcating the erstwhile joint National Commission for Scheduled Castes and Scheduled Tribes. *Act-338(A)*

Scheduled Areas have been notified for the newly created States of Jharkhand, Chhattisgarh and Madhya Pradesh with its new boundaries.

Due to implementation of the provisions of the Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA Act), STs have been politically empowered in the nine major States-Andhra Pradesh, Jharkhand, Gujarat, Madhya Pradesh, Chhattisgarh, Maharashtra, Orissa, Rajasthan and Himachal Pradesh. It implies that a total of 2,40,000 seats have been reserved for the Scheduled Tribes in the three tier Panchayati Raj Institutions (PRIs). At present 2,22,600 tribals have been elected.

With the objective of exhibiting the contribution of great tribal leader Birsa Munda, the Ministry produced a feature film 'Abua Birsa', which was premiered in the presence of the former Prime Minister.

Nearly 200 documentaries on various tribes of the country have been produced or are under production. Every Friday at 9.30 A.M., one documentary is telecast in a program on DD-1 titled "Janjatiya Darpan".

Increased allocation of funds for various schemes/programs for tribal development from Rs. 692.75 crore in 1999-2000 to Rs 810 crore in 2000-01, Rs 1,040 crore in 2001-02, Rs 1,090 crore in 2002-03 and Rs 1,087 crore in 2003- 04, representing an increase of about 56.91 per cent over the year 1999-2000. Releases during the current year were more than 99 per cent of the RE. The Budget allocation for 2004-05 is Rs 1,146 crore.

A new Scheduled Tribes Finance and Development Corporation (NSTFDC) was set up with an authorized share capital of Rs 500 crore, as an apex institution for financing economically viable projects for Scheduled Tribes. Since its inception on 10 April 2001, loans to the tune of Rs 60.24 crore in 2001-02, and Rs 98.98 crore in 2002-03 were released to tribal enterprises. Besides, financial assistance of Rs three crore was sanctioned to TRIFED for providing marketing support to Minor Forest Produce (MFP) and Surplus Agricultural Produce (SAP) that is expected to benefit 2,90,430 STS. The Corporation disbursed Rs 27.50 crore, during the year 2001-02 and Rs 42.16 crore during the year 2002-03. The amount disbursed during 2003-04 was Rs 35.72 crore. Further, Rs 2.65 lakh was released as grants during this period for imparting training to the target group in the State of Orissa.

A new scheme titled "Adivasi' Mahila Sashaktikaran Yojana" was launched through NSTFDC for extending financial assistance up to Rs 50,000 to the eligible Scheduled Tribe women at a more subsidized interest rate, a maximum up to four per cent.

The Parliament passed the Scheduled Castes and Scheduled Tribes Order (Amendment) Act, 2002. This Act provides for inclusion/exclusion/modification of 270 communities in the lists of Schedules Tribes. Revision on such a scale has been undertaken after more than 25 years.

The Ministry adopted a project approach for funding projects under Article 275(1) of the Constitution for selecting schemes based on more integrated and holistic planning.

Anthropology Paper 02 - Volume 03

Allocation for grants under Article 275(1) of the Constitution increased from Rs 200 crore to Rs 300 crore.

Funds were provided to State Governments for construction and improvement of about 1,900 km of roads in tribal areas, 250 staff quarters for schools, 312 school and hostel buildings, 2,100 class rooms, 126 community centres, and also for drinking water facility, rural electrification, culverts/causeways, rural irrigation projects and astro-turf grounds.

Released grants for construction of 88 Eklavya Model Residential Schools, thereby creating 36,960 seats from Class VI to XII for imparting quality education to ST students and at the same time providing employment for around 1,230 teachers.

Provided Post-Matric Scholarships for pursuing Post-Matriculation courses including professional, technical and non-professional non-technical courses benefiting more than 27 lakh students about 5.5 lakh students per annum). The scheme has been revised and rates of scholarship have been increased from 1 April 2003

Sanctioned construction of 298 boys' and 171 girls' hostels having 18,471 and 20,010 seats respectively and created employment for around 2,345 persons.

The ministry has sanctioned construction of 315 Ashram Schools having 24,300 seats and employment opportunities for 3,150 persons in the last four years.

For promoting education among tribal girls exclusively in 74 districts having female literacy rate below 10 per cent as per 1991 census, 183 Educational Complexes have been set up. In these complexes over 20,000 girls are enrolled annually. These educational complexes provide employment to approximately 915 teaching and same number of non-teaching personnel.

Increase in the level of Special Central Assistance (SCA) to the Tribal Sub Plan (TSP) from Rs 400 crore in the year 1999-2000 to Rs 500 crore in the year 2001-02 and to Rs 500 crore in the year 2W2-03 and Rs 497 crore in the year 2003-04, represent an increase of 24.25 per cent over the year 1999-2000.

Provided special assistance to the tune of Rs .163.36 crore for the development of infrastructure in the three newly created States of Chhattisgarh, Jharkhand and Uttarakhand.

A new Scheme titled "Exchange of Visits by Tribals" was launched for providing wider exposure and experience sharing to the tribals by visits to the more developed areas of the country.

As many as 225 NGOs were extended financial assistance worth Rs 17.84 crore by the Ministry during 1999-00. During 2000-01, the number of NGOs funded and amount of funds released to 275 NGOs and Rs 23.86 crore. During 2001-02, the amount of funds released was Rs 28,976 crore to 155 NGOs. During 2002-03, 392 NGOs were funded and funds amounting to Rs 30.38 crore were released. During 2003-04, Rs 26.46 crore grant was released to 288 NGOs. To bring transparency in sanction of projects to non governmental organizations, the Ministry has constituted a Project Screening Committee with members drawn from other Ministries and also from leading personalities actively involved in the field of social welfare. The committee is empowered to recommend deserving proposals for consideration of sanction.

The number of projects under the scheme being implemented through NGOs has increased to more than 900 from 306 projects sanctioned during 1999-2000. Through the NGO run projects of the Ministry, (a) Over 0.25 lakh tribal students are availing the benefits of free education from 106 Residential School, 56 Non-Residential School and 95 hostels annually. Approximately 1,115 teaching and over 2,000 non-teaching personnel are employed in such schools and hostels. (b) Over 1,000 tribal students are receiving computer education through Computer Training Centres. These Computer Centres are providing employment to approximately 90 computer trained personnel and 90 other supporting staff. (c) 50 Vocational Training Centres (VTCs) have been set up through NGOs to train approximately 5,000 tribals in various trades having local employment potential. These VTCs provide employment to approximately 300 training personnel of different trades and 200 supporting staff. This is in addition to 150 VTCs

→ MSP for Minor Forest Produce introduced.

sanctioned to the State Governments, which provide training to 9,000 ST youths, and provides employment to 15,000 people. (d) More than 25,000 tribal patients are being treated through 28 hospitals and 90 mobile dispensaries set up with the grants of the Ministry annually. These hospitals and mobile dispensaries are providing employment to approximately 250 doctors, 1,000 para medical personnel and approximately 750 other supporting staff. (e) Besides the above, approximately 1.5 lakh tribes are availing the benefits of other programunes like mobile library, typing and shorthand training centres, rural night schools, training in agriculture and allied subjects, etc., and in running these programs approximately 1,000 personnel are engaged.

In order to secure higher earnings and generate employment opportunity to the tribals, the tribal Cooperative Marketing and Development Federation of India (TRIFED) procures and markets minor forest produce and surplus agriculture produce.. Procurements of goods worth Rs 76.67 crore in 1999-2000, Rs 83.40 crore in 2000-01, Rs 41.04 crore in 2001-02 and Rs 25.03 crore in 2002- 03 was made in tribal areas.

An informative and detailed, bilingual website of the Ministry was launched on 21 August 2002.

Financial assistance of Rs seven crore was provided for protection and conservation of archaeologically important sites of martyrdom of tribal leaders.

The Ministry has also tied-up with bilateral and multilateral agencies for international cooperation in the field of tribal development. A few projects are under implementation.

The Government is according priority for the development of Scheduled Tribes. As announced by the former Prime Minister on Independence Day, 2003, the Ministry of Tribal Affairs will launch new Developmental and welfare initiatives for the Scheduled Tribes. These will include construction of hostels for boys and girls in all districts, which have a significant tribal population; measures to promote tribal culture; steps to honour legendary tribal leaders and construction of an Adivasi Bhawan in New Delhi.

APPROACHES TO TRIBAL WELFARE AND DEVELOPMENT (notes pg-90)

*Assimilation approach
Thakkar & Ghurye*

The term tribal welfare has been used to cover an all round development of the tribals as a weaker section of the Indian population. They are in a subsistent stage. Their comparative isolation living in and around forest and hill areas, their simple economy and limited world views have placed them in a state of death. The country is fully aware of the responsibilities and central and state governments are working to improve the economic, social, political and other conditions of the tribal population. A number of humanitarian agencies are also at work and different social and religious movements have done a great deal in the direction of tribal welfare.

(P.A.R.V.A.)

There are mainly five approaches which have been employed so far for the welfare of the tribals in India. These are the political approach, administrative approach, religious approach with special reference to missionaries, voluntary approach and anthropological approach.

POLITICAL APPROACH

Idealism

1 The political approach for the tribal welfare may be understood in the context of the pre and post-Independent periods. The colonial rule created excluded and partially excluded areas and gave separate political representation to the tribes. Nationalists opposed these measures as a part of diabolic conspiracy to a new separatism. This policy of exclusion has been much criticized for its negative character.

2 After Independence, the constitution has given to the tribes, a number of safeguards considering them to be the weaker sections of the population. In the first instance, a period of 10 years was given to achieve the goal, but as the problem was too complicated to be solved in a single decade, it has persisted through decades.

The tribal people are politically democratic in nature. Their leaders respect each of their fellow men. They have also received a share of about 7% in the Indian republic through the Lok Sabha and Vidhan Sabhas.

DN Majumdar - 2 approaches ① Admin approach ② Reformist approach.

LP Vidyarthi - P.A.R.V.A

Only a tribal can stand for election to these seats. With the emergence of such new tribal leaders, no doubt the tribal issues are getting politicized but it is hoped that with enlightened tribal leadership, the solution to the problem of poverty will be accelerated in a peaceful democratic way.

The Republic of India has accepted the British policy of the isolation (exclusion) in a modified form. The partial exclusion of largely tribal areas followed by special welfare measures offers not only negative approach but also initiates an imposed programme of change to bring them into the main stream of the Indian population, where as the most desirable course would be to work for the integration of the tribals in the regional and national setting and for avoiding the creation of separatist minority with vested interest.

Various all India tribal conferences organized by the Government or actively supported by it are indirectly creating new solidarity in tribal India. Over and above, in the context of present day separatist trends, the possible implications of such development will have to be closely watched and analyzed. The division of the whole North-Eastern India into different full fledged states like Nagaland, Mizoram, Meghalaya, Tripura and Arunachal has to be viewed not only from the point of view of tribal interest but also against the wider canvas of regional and national life.

ADMINISTRATIVE APPROACH

1 The administrative approach is closely followed by the political approach. The Government of India has constituted vast administrative machinery for tribal welfare. The present structure of the administrative setup for tribal welfare has evolved through interactions among the national leaders, social workers, tribal elders and applied anthropologists. The President of India is primarily responsible and has been given powers to safeguard the interest of these communities and he has appointed the Director General for Backward Classes at national level with special duties of investigations into all matters related to safeguards given to the tribal people. The Director General with the help of Regional Directors virtually handles funds and controls all the tribal welfare activities. He submits his report annually detailing all that has been observed by his personnel and through his Regional Directors.

2) No separate cadre
- other officials
are deputed
posted on deputation
3) Postings are
considered as
punishments

4 At the state level, the Governor has been made responsible and on his behalf, the Chief Minister and the welfare minister are in-charge of the special schemes to be implemented in the tribal areas. Yet, it never means that the general developmental works are dropped. In fact they take their own course. In some major concentrated tribal areas, the state has an Independent tribal welfare minister. The welfare minister is advised by two bodies, The Tribal Advisory Council and The Tribal Research Institute in framing the policies and programs for the tribal welfare. A Deputy Director for backward classes is posted by the Centre who acts as a liaison between the national and the state levels. There is a direct control of Parliament on the welfare activities which are looked after by the Parliamentary committees on the welfare of Scheduled Castes and Scheduled Tribes. From time to time the Government has constituted different commissions to assess and analyze the welfare work.

5 By an analysis of the tribal Administration in India, it is clear that there is a need to make the tribal development administration better adapted to the environment of the tribal culture. The goals have to be clarified in accordance with the national development and not only communicated through training programs or supervision of field staff but also made part of their value patterns. Integration can be developed only through building up a spirit of team work as well as a high level of work through democratic leadership on the part of the administrator and restructuring the basic pattern of tribal administration.

RELIGIOUS APPROACH

1 The religious approach to tribal development is attempted by different religious agencies like the Christian missionaries, Ramakrishna mission, the Arya Samaj and other local institutions. At the same time, conversion of tribals to a new faith like Christianity has also taken place. This conversion activity has formed in-groups among the tribals. The missionaries of various denominations have been active in different parts of tribal India, especially in tribal Bihar, Eastern Madhya Pradesh, North Orissa, in middle India and Meghalaya, Nagaland and Mizoram in North-Eastern Himalaya.

Beginning in the middle of late 19th century and early 20th century, the Christian missionaries have been active in tribal India. Though they have been primarily interested in evangelization, the welfare works - educational, economic, hygienic work and social welfare called "work of mercy", have invariably followed for both types of work, spiritual and material. The missionaries did realize the importance in understanding the tribal culture and language. These they considered essential for communicating with them effectively.

Missionaries' welfare activities have been viewed by different persons in different ways. Mahatma Gandhi stated that what the Christian missionaries did does not show spirituality though he recommended the Christian missionaries to associate themselves with reform work among the lower classes of the people; he wanted them to do so without any conversion. Elwin comments that the missionaries are anxious to see the primitive civilized, their "inferior" social customs and ideas eliminated and their identity assimilated into the church. According to M.N. Srinivas, the opening of schools, hospitals and other welfare agencies by the missionaries in areas where the Harijans and Tribals live appears to the Hindu as only baits in the trap of conversion. The linking up of humanitarianism with proselytization has rendered the missionaries suspect. Even very liberal, westernized Hindus feel this way.

Thus if the conversion of tribes to a new faith adds to their social solidarity without alienating them from the majority of neighbouring communities and equips them better for participation in the modern life, it cannot reasonably be opposed. But if it destabilizes and disintegrates these communities without offering them any alternative satisfaction, the approach can hardly be said to be offering any meaningful solution to the tribal development.

VOLUNTARY AGENCIES APPROACH

Under the Voluntary Agencies approach, social workers, social welfare agencies, social movement agencies, social reformers etc., are working to uplift the weaker sections of our societies in their own ways.

When India became independent in 1947 and the attention of the government to tribal welfare activities increased, the social workers found the political and administrative set up very favourable. They found their own colleagues and party men at the helm of governmental affairs. The government therefore, sought all cooperation from the social workers in framing tribal policies and delegated their power to social workers in the execution of the welfare schemes among the tribals. In this way, as a matter of fact, the social workers assumed the role of both semi-officials and scientists. They began making recommendations to the government on tribal matters and also setting substantial grants from the government fund for helping the tribals, and later on they held administrative posts for tribal welfare schemes.

Social work agencies at state level also existed and these institutions were given grants to run schools, hostels, dispensaries etc. The state level agencies are mostly affiliated to All India agencies, especially, the foremost like the Bharatiya Adimajati Sewak Sangh started in 1948 under the presidentship of late Dr. Rajendra Prasad, Indian Red Cross, Orissa Adivasi Congress, Anveshi, Positive People.

Voluntary social service organizations have done considerable humanitarian work in the tribal areas, but often their idealism and spirit of service have not been matched with their understanding of the tribal organization, values and problems. They sometimes went into the tribal areas with an omnibus solution to the tribal problems as they understood them, while in reality, the problems for different tribal groups and even for a section of one tribe were often different. Their motives were probably laudable in their own cultural frame of reference, but not so against the tribal scheme of values. They failed to realize that their well intentioned "reforms" may be injurious to the tribes in terms of their socio-cultural life.

ANTHROPOLOGICAL APPROACH

A section of politicians and social workers have taken some sadistic pleasure in maligning anthropologists and in criticizing them for conspiring to put the tribes in a veritable zoo, so as to be able

to practice their blessed service undisturbed. But this section of critiques have obviously fighting non-existent ghosts. The fact of matter is that there is not one anthropological approach, there are anthropological approaches. Instead of offering an omnibus solution to tribal problems, the anthropologists have been thinking of possible solutions.

Many people criticize the anthropologists for their theory of "Isolationism" and attribute this only to academic interests of the anthropologist. They consider "separatism" and "isolationism" to be dangerous theories as they strike at the root of national solidarity.

The importance of the knowledge of anthropology for efficient administration was perhaps realized as early as 1807, when the court of directors of the East India Company made a formal decision that such knowledge would be of great use in the future administration of the country.

Anthropological knowledge in the changed situation of the country as a welfare state is of great importance. By and large anthropologists believe in the ultimate integration of the tribes into the mainstream of the Indian life. Many controversies took place in the early 30s to 50s about the contributions of anthropology to the tribals. The anthropologist stand regarding the tribal problems continued to be condemned at the administrative level. The temporary isolation of the tribals by Verrier Elwin faced a number of criticisms. His idea of a "National Park" and isolation was taken to be the anthropological approach to the tribal problem. Due to this, the anthropologists were labelled as "Isolationists" and "revivalists" by the social workers.

After independence in 1949, some anthropologist came out with several papers and addresses dealing with the importance of applied anthropology in the tribal welfare programs. They made an evaluation of anthropological approach and came out with the theory of "Planned Acculturation" and few other anthropologists highlighted the various problems of the Adivasis and suggested ways and means to ameliorate their economic and social conditions. A vast organization of anthropological researches is available to help and guide the welfare work. There are many tribal research institutes and others which are engaged in conducting researches on the scheduled castes and scheduled tribes.

The anthropologists have generally suggested the following:

1. Understanding the tribal organization and values through sustained scientific studies.
2. Identifying the problems of tribes of different levels of technological, economic and cultural development.
3. Identifying the integrating forces in tribal life.
4. Identifying the areas of minimum and maximum resistance to innovations in their culture.
5. Recognizing the vital linkages in their cultural fabric.
6. Orienting the administrators to tribal life and culture in all aspects considered above, and giving them special training for the task they have to undertake among the tribes.
7. Cautious formalization of welfare plans with a view to accommodate tribal needs with regional and national interests.
8. Careful watch on the trends set in motion by these measures with a view to eliminating elements that destroy the social solidarity of the tribes and kill their zest for life.

If the welfare projects are implemented with understanding and causation, the first effective step against primitiveness would have been taken. There is much in tribal life that can be preserved without reducing the tribals to the position of museum places and without barring their logical development, and there is no doubt that this could be done with imaginative planning and a carefully designed strategy of implementation.

NEEDED APPROACHES

- 1) **The Integrated Approach:** Tribal administration in India is already along this approach to some extent. But to make this approach a real success, all the political, administrative, religious and social workers should combine well and work in harmony with anthropological approaches. Anthropologists should be allowed to work as experts. Anthropologists are to be made responsible for the execution of development programs or those involved should seek guidance through them.

This approach is suggested because the welfare activities in many areas are looked upon by the general tribal population with great suspicion. The tribal leaders particularly have been critical of social workers in whom they found political competitors. With the emergence of new tribal consciousness, tribal political parties, Government and social workers are becoming conscious of their expected paternalistic attitude to tribals. These people now half heartedly are taking the applied anthropologists and tribal leaders into close contact in the planning and implementation of tribal welfare schemes. The Government fully realized the utility of an integrated approach, a work relationship between scientists and administration.

- 2) **Area Development Approach:** Development works in tribal areas can be carried on in an area basis. This will cover areas of major tribal concentration as well as tribal pockets.

The broad frame work for the purpose may cover

1. Micro-area
2. Meso-area,
3. Macro-area ~~Block - few villages~~
4. Tribal pockets

This approach is meant for smooth and all purposive development in various programs.

Macro-area should consist of a block area with special reference to few villages and a population of 10,000 for specified period and in due course the whole area can be covered. Meso-area is to be limited to a sub-division with special attention to few blocks and a population of 5 lakhs for specified period of time and with a ultimate aim to cover the whole sub-division. The Micro area can be a block and the tribal pockets are the ones which have scattered and little number of tribal population.

- 3) **Single Line Administration:** Administration given to tribes should be in a single line. One administrator say, an area development commissioner, for the area should be held responsible for the whole development work of the region. This will also suit the tribals because they know who to approach. The area development commissioner with help of an anthropologist as a co-administrator should co-ordinate all the affairs of region.

- 4) **Small District Approach:** To ensure good results of the inputs and easily approachable administration, small districts have to be carved out of big districts. This will ensure fuller development of the area.

- 5) **Separate Tribal Development Programs:** Tribal development should not be tagged with Scheduled Castes as both have distinct ecology, concentration and socio-economic life. Along with all these, the concept of "welfare" is to be replaced by concept of development. There is an increasing necessity of ending the bonded labor and other exploitations by non-tribals, restore land to tribals, free them from indebtedness and ensure speedy implementation of development schemes. These measures reduce the economic dependency which is a single most important barrier for the approaching tribal development.

COMMISSIONER FOR SCHEDULED CASTES AND SCHEDULED TRIBES

Article 338 of the Constitution provides for a Special Officer for the Scheduled Castes and Scheduled Tribes to be appointed by the President. It is the duty of this officer to investigate all matters relating to the safeguards provided for the Scheduled Castes and Scheduled Tribes under the Constitution and report

to the President on the working of those safeguards at such intervals as the President may direct. The President shall cause all such reports to be laid before each House of Parliament.

The Government of India appointed a Special Officer on 14th November, 1950 and he was designed as Commissioner for the Scheduled Castes and Scheduled Tribes. The Commissioner has been assigned the responsibility of investigating all matters relating to the safeguards. He has to keep the Union Government and the Parliament informed of the progress in the implementation of the safeguards for the Scheduled Castes and Scheduled Tribes and the schemes for their welfare. The Commissioner has to maintain contacts with the tribal people and State Governments examine their programs and guide them in framing and execution of their schemes.

Commissioner's Report:

It is the duty of the Commissioner not only to investigate matters relating to safeguards but also to report on their working. Unlike the Governor's Report which is to be submitted to the President annually or whenever so required by the President, the Constitution does not prescribe any time limit for the submission of report to the President by the Commissioner of Scheduled Castes and Scheduled Tribes. The Government of India has not issued any instructions or guidelines to the Commissioner regarding the periodicity, contents or format of the report. It has been left to the discretion of the Commissioner to decide on the pattern and the contents of his report. The report is generally to be submitted annually. But there is a delay in the submission of report. At times the reports for several years are placed before the Parliament together. With such delay typicality of the issues is lost. There is hardly any follow up action taken on the report.

The report describes in general the achievements and deficiencies in the administration of the Scheduled Areas, and the welfare of the Scheduled Tribes. There is no state-wise assessment of the working of the safeguards and the implementation of welfare programs.

The Commissioner's report is dealt with in a routine way. No directions are being issued on the report. The efforts made by the Commissioner to draw the attention towards the shortcomings in the administration of tribal areas and implementation of welfare schemes are accepted by the Union Government as a routine criticism. The report of the Commissioner should be given as much importance as is given to the reports of the Estimates Committee and Public Accounts Committee. The recommendations of these Committees are generally accepted by the Government and if they are not, the Government gives explanations to the Committees which reconsider their opinions. If difference of opinion persists, the matter can be raised in the respective legislatures.

The Commissioner has supporting staff including Special Commissioners, Deputy Commissioners and Assistant Commissioners. However, difficulties have been experienced in seeking cooperation of State Governments, Central Ministries and Departments. So far, the Commissioner has depended on the persuasive approach for collection of information. This has invariably resulted in delay in completion of investigation. In order to ensure effective functioning of the Commissioner, the States and the Union Ministries should provide the information in time. They should also furnish report on actions taken on various deficiencies pointed out in the report and also take steps for implementation of the welfare measures.

Since the problems of Scheduled Castes and Scheduled Tribes are totally different, the Dhebar Commission had recommended appointment of separate Commissioners for Scheduled Castes and Scheduled Tribes. But instead of accepting this recommendation the office of Commissioner has been strengthened from time to time. In the beginning the Commissioner was supported by the Assistant Commissioner. Later a post of Deputy Commissioner was created. Recently two Special Commissioners have been added to the strength of the staff. The strengthening of the office of the Commissioner has not made it effective. Instead separate Commissioners should be appointed for Scheduled Castes and Scheduled Tribes. The Scheduled Castes and the Scheduled Tribes Commission needs to be vested with the powers of enquiry under the Commission of Enquiry Act.

Preparation of a combined report on the distinct problems of Scheduled Castes and Scheduled Tribes has not achieved the desired objective. At least the report should be prepared in two parts so that the magnitude of problems of these communities could be clearly highlighted.

The Commission for Scheduled Castes and Scheduled Tribes was created with a Chairman and four members in July, 1978 by a resolution of the Government of India. This has now been reorganized and the strength has been raised from five to twelve including the Chairman who is appointed for a fixed term of three years. The Commission is of a national level advisory body on broad issues, policy and development.

Besides, a senior officer of the level of Secretary to Government of India has been also appointed in the Cabinet Secretariat to look after the interests of these communities. The reservation and personnel problems of Scheduled Castes and Scheduled Tribes are looked after by the Ministry of Personnel. Thus, there are five agencies viz., Commissioner, Commission, Officer on Special Duty in Cabinet Secretariat, Ministry of Welfare and Ministry of Personnel to look after the interests of Scheduled Castes and Scheduled Tribes. Multiplicity of agencies at the Centre has created more confusion than ensuring united efforts for the welfare and development of the Scheduled Tribes and Castes. The interest of these communities would be better served if the Ministry of Welfare is made responsible for all administrative, personnel, welfare and development matters. As the problems of the Scheduled Tribes and Scheduled Castes are different two separate Commissioners may be appointed for them. They should be given statutory powers for collection of information and investigation into matters, and suitable provisions may be made for implementation of the recommendations of their reports.

AN ANALYTICAL REVIEW OF TRIBAL DEVELOPMENT

The tribal situation in the country poses peculiar problems of development, not encountered in other areas. The peculiarities can be broadly summed up as geographical, demographic, socio-cultural and exploitative. Shyness of contact with the community at large has been the most distinguishing feature of the tribal population which follows from geographical isolation of the vast majority of the tribal population in the country. Demographically speaking, there are some 250 scheduled tribe communities with several subgroups speaking some 100 languages/dialects. Most of these tribes constitute separate socio-cultural groups having distinct customs, traditions, marriage, kinship and property inheritance systems living largely in agricultural and pre-agricultural level of technology. The tribes contain a good section consisting of food-gatherers, hunters, forest-land cultivators, shifting cultivators and minor forest produce collectors. Their geographical isolation and impoverished economy made them subject of abominably restrictive and uncharitably exploitative economic and trade practices of non-tribals living in or entering into the tribal areas.

Early Experiments:

As a strategy of comprehensive development of the rural areas in the country, a program of community development was launched in 1952 in the First Five Year Plan. The entire country was covered by community development blocks which applied equally to the tribal areas. But it became clear that the tribal areas needed special treatment and hence the existing efforts were sought to be strengthened in 1954 by launching a few special multipurpose tribal development projects covering a few blocks.

The purpose of launching the special multipurpose projects was to evolve a more satisfying concept of tribal development to be made applicable to the tribal areas in the country in general. A review of this program pointed to the need of constituting tribal development blocks with an area of about 150 to 200 sq. miles and with population coverage of about 25,000. Tribal Development Blocks multiplied and about 40 per cent of the tribal population in the country were covered by 500 such blocks by the end of the Third Five Year Plan.

The community development block approach and the tribal development block approach had some common aspects. Both were multi sectoral in approach and both were mainly developmental in outlook lacking in specific administrative perspective and organisation to take care of the special needs of the tribal population. Both neglected the protective aspects of the tribal's requirement. On account of the

reason that members of the general community were far advanced, educationally and economically, compared to the tribal community, advantages offered in these approaches were taken advantage of in a much greater measure by the former than by the latter. While in general terms education and economic prosperity made progress, the gap between the general community and the tribal community became wider than before. To an extent, there was advancement in both the non-tribal and tribal fronts; but the relative advancement of the one was greater than similar advancement of the other community. While the TD block approach was an improvement over the general block development approach in that it attempted to focus attention on tribal areas, the focus was diffused so far as specific problems of tribal population and groups was concerned.

Dhebar Commission and Shilu Ao Committee:

Important observations were made by the Scheduled Areas and Scheduled Tribes Commission (Dhebar Commission) 1961, and the Shilu Ao Committee, 1969 on planning, implementation and administration of programs for tribal development. They took the view that mere area development was counter-productive which may as well act as a beacon beam to the more advanced communities to creep into the tribal areas for purposes of self aggrandizement. A firm protective base and a depth vision into the administration and infrastructure inadequacies were called for, particularly to handle the problems of land alienation, indebtedness and educational backwardness.

Target Group Approach and the TDA Experiment:

During the Fourth Five Year Plan an approach to develop specific target groups and areas like small farmers, marginal farmers, agricultural laborers, drought prone areas, etc., was conceived. This approach took a particular section of the population, occupational category or a specific problem area for development through strategies appropriate to the end. The general block development approach was not to be abandoned but was to have the special approach superimposed on it in the interest of the target groups/areas. The tribal development sector was considered to be another fit arena for adoption of this approach.

Accordingly, the idea of special tribal development agencies was conceived and eight such agencies were operationalized in Andhra Pradesh, Bihar, Madhya Pradesh and Orissa. A mini administrative frame with a Project Director at the head was provided to each agency with the stipulation that the agencies pay attention to problem areas specifically relevant to the tribal populations. Programs in agriculture and allied sectors which concerned the tribal section vitally, social services and development of arterial roads to improve communications were brought within the scope of activity of these agencies with a marginal orientation towards steps designed to counter the exploitative endeavours of the anti-social elements. The tribal development blocks were too small to work as effective units for planning and implementation. This deficiency was sought to be removed by making the tribal development agencies as big as sub-divisions.

The pilot experiment with the tribal development agencies was not a cent percent success as the agencies confined themselves, in practice, mostly to agricultural programs and development of arterial roads; but they provided valuable insight into deficiencies in planning and administration, both organizational and financial. They suggested that mere grounding of a special administrative frame was not enough unless a coordinated approach to the tribal programs at a sufficiently high level is taken and methodologies are devised to ensure flow of funds into several sectors, both regulatory and developmental, concerning tribals and not merely to a few specified sectors under a fragmented sectoral approach.

The Tribal Sub-Plan Approach:

A comprehensive view of tribal problems was taken at the beginning of the Fifth Plan. Besides the Task Force on Development of Tribal Areas 1972, the Planning Commission constituted during the same year a Working Group on Personnel Policy for the Tribal Areas under the chairmanship of Shri. R.N. Haldipur. Several other groups and teams were to go into problems of tribal areas cooperatives, rural indebtedness, land alienation, excise policy, etc. The result of these deliberations was the birth of a new strategy of

tribal sub-plan within the broad framework of the state and the Central plans.

The long term objectives of the Tribal Sub-Plan approach were to narrow the gap between the levels of development of tribal and other areas while improving the quality of life of the tribal communities. In brief, the approach envisaged tackling the tribal problems by categorizing them under three identifiable areas and groups:

1. In regions of substantial tribal concentration, an area development approach is to be combined with a focus on the tribal population and their problems;
2. In smaller areas of dispersed tribal population where the scheduled tribes live merged with the general population, a modified area approach on account of the truncated nature of the habitat but with similar focus on the tribes would be called for; and
3. Certain extremely backward and smaller tribal groups living generally in pre-agricultural level of technology in inaccessible areas and facing the problem of their very survival would be treated as a special category both within the areas of tribal concentration and outside and special group-oriented programs would be formulated for them.

These three categories were brought respectively under Integrated Tribal Development Projects (ITDP), Modified Area Development Approach (MADA), Pockets and Primitive Tribe Projects.

The new tribal sub-plan strategy consisted of a twin approach of area development and problem solving. The strategy intended to achieve a balance between economic development, infrastructure and educational advancement and anti-exploitative protective measures. At the same time, it also visualised progressive obliteration of the disparity between the scheduled tribes and the rest of the community over a period of time with a view to put the tribal population in the mainstream of national life at par with the others. These objectives naturally required diverse measures; identification of bottlenecks and barriers working against forces of development and agencies working as promoters of change. They required assessment of felt needs and existing human potentialities on which further development would be planned. Sourcing of resource for the purpose and formulation of well thought out sectoral plans under a comprehensive and unified purpose of tribal development acquired considerable importance in this background. And to translate all the above mentioned into reality was required the right type of administrative inputs and an administrative set up that performed. Selection of the right type of personnel having the necessary empathy and understanding of tribal problems was also considered to be of prime importance.

It was felt that a purposive administrative system in the tribal areas should have operational units which have adequate administrative and financial delegation to take decisions with efficacy and dispatch, in the light of the felt needs of the people whom it served. As programs of development implemented by individual development departments of the state were liable to miss the tribal perspective in their general thrust on the sectoral development front, the senior field executive of the tribal area administrative unit was designed to be a coordinating officer. The post of the Project Administrator/Project Officer was fashioned in this light. To inform people's participation and ensure the guiding touch of the Collector, the key development arbitrator of the Indian Administration hierarchy, the District Collector was made the Chairman of the Implementation and Review Committee at the Project level with local MPs, MLAs, besides other district officials as members.

As a part of new orientation to ensure resource mobilization for meeting the requirements of tribal sub-plan, the state plan outlay, sectoral outlays of the Central ministries and institutional finance were specifically identified as the source of finance for implementation of programs by the tribal area administration. In addition, a new scheme of special central assistance to be administered by the Ministry of Home Affairs in the interest of tribal area programs was instituted as an additive to state plan efforts. The tribal administration at the state and Central levels were to ensure flow of all these funds to the project areas for investment in eligible schemes. Financial discipline and non-divertibility of tribal sub-plan funds were sought to be achieved by prescribing separate budget heads for tribal sub-plan

provisions under the respective functional demands of the concerned sectoral departments or by bringing all budgetary provisions for tribal area development in all sectors under a unified demand with suitable minor heads, to be controlled by the Tribal Development Department of the state. Suitable mode for exhibition of these amounts separately in their respective budgets was also to be adopted by the Central ministries. The stipulation to isolate the non-divisible component of the Plan outlay and to earmark a substantial portion of the divisible component as to ensure, vis-a-vis the total state plan, a financial flow proportionate to the percentage of scheduled tribe population in the state was designed to further bolster up the new approach.

The impact of the new arrangement will be clear from the fact that state plan outlay for tribal development programs rose from Rs. 900 crores during the Fifth Plan to Rs. 3,550 crores during the Sixth Plan and the total investment from 1,182 crores to about 5550 crores. The Central ministries' investment was around Rs. 700 crores during the five year period of the Sixth Plan as against an average annual investment of about Rs. 75 Crores in the preceding years. Investment from institutional sources rose to about Rs. 800 crores during Sixth Plan as against Rs. 150 crores during its preceding plan.

Monitoring and Evaluation:

As the scope and content of tribal development programs increased, the need for adequate monitoring and evaluation to obtain a regular feedback from the field to a view to suitably reorienting programs and policies was keenly felt. A Working group on the subject appointed by Ministry of Home Affairs in 1978 recommended a three tier monitoring at block, ITDP and state levels with overall monitoring at the level of Ministry of Home Affairs. Monitoring cells, both at the state level and at the level of Central ministries, have been opened. Evaluation studies both holistic and covering specific areas/programs have been taken up by field organizations under the states, the tribal research institutes, national level autonomous organizations and professional bodies. The recent most development in the sphere has been to take recourse to concurrent monitoring cum evaluation in the beneficiary oriented programs. It has been widely diagnosed that the cost of setting up of a countrywide full-fledged monitoring cum evaluation Organisation would be prohibitive and this new device, if implemented in its true spirit, is likely to meet the needs of tribal area administration amply.

Legislative Backup:

The brief outline of conscious effort to rationalize and reorient the administrative system in the country to suit the requirements of tribals who constitute, educationally and economically, the most backward section of the country's population confirms a general appreciation of the special provisions enshrined in the Indian Constitution in Articles³ 36, 275, the Fifth Schedule and several other articles. States having tribal population enacted regulatory and protective legislations on land alienation, money lending, rights to forest growth, excise and several other spheres of exploitation, besides the central law on bonded labour abolition, to arm the administrative organisation with the much needed legislative support.

Shortcoming:

Innovation in administrative procedures and system however, seldom yields visible results in the short run. Time required for percolation is generally quite considerable in the Indian context where both the depth and expanse of the administration cover are large and complicated. Naturally, there are not a few shortcomings still persisting. These mainly relate to coordination, linkage, involvement of beneficiaries and organizational inadequacy in certain spheres.

1. **Coordination:** The project administrators at the ITDP level were envisioned to be a coordinator of all activities in the project area. Programs of rural development in the tribal area under integrated rural development, national rural employment, rural labourer's employment guarantee program, etc., were to be subsumed within the ITDP program with the project administrator acting as the coordinator at that level. This was also intended to apply to all other programs taken up in the tribal areas by various sectoral departments. All this was visualised in the interest of a unified and integrated approach to tribal development. In the historical context in which the developmental administration

in the country grew at the district level, it has not yet been found convenient by the states to put the project administrator in sole coordinating charge of all items of developmental administration within his jurisdiction. Such a step has in some quarters been considered to be detrimental to effective hierarchical control with likely adverse repercussion on enforcement of departmental responsibility. There is an element of fallacy in this argument; but yet the general administrative consciousness of the country has to recognise it before the idea can be implemented in an acceptable form.

2. **Inter Linkage:** Largely following from the co-ordinational aspect is the one relating to linkage of programs, so very desirable for alleviation of poverty amongst the tribes. Placed at the lowest rung of the economic order, they need not one but a package of schemes, suiting their habitat, occupational pattern and genius, to lift them above the morass of poverty. In such a background, not merely forward and backward linkages in terms of credit, marketing, etc., but also horizontal linkage as between different anti-poverty schemes administered by different sectoral departments are necessary. To bring several types of schemes simultaneously at the door of a single tribal family, who may be in need of it, a suitable administrative approach with organizational procedures and prescriptions oriented towards such an inter-linkage is necessary. In an understandable exuberance of enthusiasm for welfare of the tribes, a few states like Bihar and Assam have established separate autonomous authorities for tribal regions. Tripura and Manipur have statutory district councils for tribal and hill areas, besides other such councils in specified tribal areas under the Sixth Schedule of the Constitution. Here, as under the autonomous tribal development authorities, the respective organizations exist largely apart from the ITDP project administration and convenient meeting points for them will have to be identified.
3. **Beneficiary Involvement:** The beneficiaries of a welfare administration should not be made mere recipient and onlookers while the government acts as a gigantic dispenser of schemes. This is particularly germane to the tribal situation where socio-cultural isolation from the general community is considerable in some cases. No doubt, there are at present quite a few institutions, like the Panchayat Raj institutions, the autonomous tribal development authorities, the project implementation committees at the projects level and the tribes advisory councils in the scheduled area states for their association. But there is a case for improving active participation, particularly at the project formulation stage, as distinguished from formal participation. The projects for the tribal area units of administration have been mostly formulated by official agencies with minimal consultation with tribal representatives. The concept of planning form below has far greater relevance in the context of the tribal community whose socio-cultural and economic background differ from the general community. In this background, while the earlier project reports formulated have served as good guide documents for practical implementation, there is a case for perfecting and institutionalizing a three tier system of beneficiary consultation at block, ITDP and district levels to make the tribal project reports more need based, more reflective of the local aspirations and apt in the ecological environment of a particular tribe or its sub group. Not less strong is a case for involving the traditional tribal functionaries and offices in project formulation and implementation, particularly in areas where age-old socio cultural and economic institutions of the tribes till continue to hold good sway. Instances which could be cited include the Manki-Munda system in Singhbhum and the Pradhans and Parganaits of the Santhal Parganas. The Panchayat Raj, Cooperative and protective legislations could profitably be amended to secure their representation to an adequate degree.
4. **Strengthening Organisation:** Inadequacy of organizational framework in certain geographical areas inhabited by the scheduled tribes as also in certain vital developmental spheres needs serious attention. Till the end of the Sixth Plan, a minimum administrative setup for all the identified primitive tribal groups in the country could not be grounded in all the states. A suitable mechanism of development for a vast mass of tribal forest villagers and shifting cultivators has yet to be perfected. While modality for meeting the protective and developmental needs of several categories of vulnerable tribal groups, including those living in areas of industrial influence, has to be worked out, designing a suitable administrative organisation for rehabilitation of a vast mass of tribal population - who have been ousted and displaced following implementation of a large number of irrigation, power,

enabling improvement in conditions of certain communities with particularly low development indices.

- Dehebari Commission - stated that within STs there existed inequality in rate of dev.
- In 6th 5yr plan - PTG subcategory was created based on Dehebari's report.

Anthropology Paper 02 - Volume 03

mining and industries projects in the resource rich tribal areas of the country - is an urgent need of the present day. Evolving suitable technology acceptable to tribal communities and commissioning an administrative formulation capable of taking a holistic view of the need for improving the degrading tribal area environment and ecology are also important present day challenges.

The country has advanced pretty far since pre-independence days in moulding and fashioning a suitable administration for the scheduled tribes and the tribal areas. It may not be futuristic to hope that the rest of the problems nagging the country will be duly taken note of in its strategy for tribal development.

Primitive Tribal Groups + (CSC Aug -2013 - pg-67)

The Concept of Primitive Tribal Groups

The Government of India lists certain communities in the country as Scheduled Tribes in exercise of powers conferred by clause (1) of Article 342 of the Constitution of India. The Notification of Scheduled Tribes communities are State specific. The identification of Scheduled Tribes is done on the basis of following characteristics:-

1. Primitive traits;
2. Distinctive culture;
3. Geographical isolation;
4. Shyness of contact with the community at large; and
5. Backwardness.

① However, not all these ^{Tribal} communities are at the same level of development. In fact, there are certain communities that are at a much lower level of development even as compared to the other Scheduled Tribe communities. It was also observed that in the matter of devolution of funds for the development of STs, the major share was taken by those communities who are more assertive and in a better position in demanding such benefits. As a consequence, the marginalized STs were left out of the process of development. since independence

② In order to ensure the development of these communities, certain groups were identified for the first time in 1975-76 and thereafter in 1993, who are regarded as the poorest of poor amongst the STs and were called Primitive Tribal Groups (PTGs). The criteria fixed for identification of such PTGs are:

- ③ ✓ 1) Pre-agricultural level of technology; ✓ economic subsistence
✓ 2) Very low level of literacy; and ✓ subsistence level of economy.
✓ 3) Declining or stagnant population. If groups satisfy even one criteria, they are considered PTG

④ Based on the above-mentioned criteria, 75 tribal communities were identified as PTGs spread over what are now 17 States and one UT. (See the tables at the end of the topic). Although the Tribal Sub Plan concept and the Special Central Assistance to the State Governments have been in operation since the Fifth Five Year Plan, it was felt that these funds were not reaching the Primitive Tribal Group (PTGs) in proportion to their requirements and as such not much development had taken place in respect of these communities.

Although there was progress as per Human Development Indices in the conditions of the STs, yet the benefits were not percolating to the Primitive Tribal Groups (PTGs), who lived in not only far flung regions but in remote and inaccessible areas and in small numbers. Therefore, in 1998-99, a Special Central Sector Scheme was introduced with the approval of the Planning Commission and Ministry of Finance with the objective to cover those items/activities which, though very crucial for the survival, protection and development of PTGs, are not specifically catered to by any existing schemes, State or

(Go to page -321)

Central or by guidelines governing the utilization of funds under Special Central Assistance to Tribal Sub-Plan and Article 275(1) of the Constitution. Such items/activities cannot be exhaustively identified at the Central level as they may differ from State to State and even within a state, and from project to project. However, funds under the scheme could be used for helping the beneficiaries of the project to cope with extremely adverse pressures, which threaten their survival and protect them from various forms of exploitation, thereby bringing them to a stage when they can demand and receive specific assets and services.

Although the Tribal Sub Plan concept and Special Central Assistance to State Governments for the socio-economic development of the Scheduled Tribes have been in operation since the Fifth Five Year Plan, the benefits of these schemes are not percolating to the Primitive Tribal Groups to the desired extent. A special Central Sector Scheme was introduced in 1998-99 with the approval of the Planning Commission and Ministry of Finance with the objective to cover those items/activities not already covered specifically by any existing schemes. This scheme should be implemented in the right earnest so as to give a boost to the development of PTGs and bring them to the stage from where they can demand and receive the services.

Identification and Rehabilitation of PTGs

The State Governments submit proposals for identification of PTGs in accordance with the prescribed criteria. The proposals of the State Governments/UT Administration are examined in the Ministry of Tribal Welfare in consultation with Planning Commission. If a community, on examination fulfills the prescribed criteria, then that community is identified as PTG. According to the 1981 Census, the population of PTGs is 20.43 lakh and as per the 1991 Census it is 24.13 lakh. PTGs have been identified since 1975-76. The last PTG was identified in the year 1993-94. No PTG has been identified based on figures of 1991 census. → New PTGs ?

The GOI has requested the State Governments with PTG populations to conduct special surveys to ascertain the socio-economic status of the PTGs like population, literacy levels etc. This exercise is undertaken with an idea to get realistic data to enable the GOI to formulate special programs in the Five Year Plans for overall development of these vulnerable groups. Even though special programs for PTGs have been in place since the Fifth Five Year Plan, there has never been a case where a particular tribe has been removed from the PTG list, which is brought on par with other ST population of the country. The PTGs are in various levels of economic development including pre-agricultural level, stagnation of population and low literacy. Efforts are however in place to bring these groups out of their primitive levels of existence. Even though some PTGs have attained a reasonably high standard of life while still retaining their cultural identities, no State Government has, however, suggested the deletion of their names from the PTG list. As no separate targets are set for PTGs, there are no statistics available to ascertain how many PTGs are actually benefitting from the GOI programs.

There are no special action plans made by the Central Government to rehabilitate the PTGs in their own habitat. It would be beneficial for them if such action plan spells out programs like construction of houses and reclamation and development of lands for PTGs for their rehabilitation and development. The Central Government does not make any adequate assessments of the specific needs of the PTGs as their development is taken care of by the various State Governments and NGOs. Though the Central Government has developed a specialized questionnaire to assess the socioeconomic status of the PTGs and asked the States to complete the same, as no time frame has been fixed, most of the State Governments have not submitted any such data till date. The Central Government should persuade the regional governments to complete the task of collecting socioeconomic data from PTGs to enable the former to come out with adequate programs and funding. The Tribal Welfare ministry, unfortunately has no authentic data available on PTGs.

This situation highlights the lackadaisical attitude of the ministries towards the development of PTGs and their commitment to bring them on par with other ST population of the country.

Funding for Development of PTGs

Though the Union Government releases funds to the various States for tribal welfare and development under the Special Central Assistance to Tribal Sub Plan, no separate fund allocation is done for the special needs of PTGs. The State Governments are left to decide on how they want to utilize the funds, based on their assessed needs.

- ✓ During the year 1998-99, a separate Central Assistance Scheme with 100% funding to state governments and NGOs for development of PTGs was initiated. The schemes for PTG now provide funds only for the PTG, and not other STs. The Ministry of Tribal Affairs reviews the programs for the development of PTGs with the State Secretaries and concerned NGOs annually through meetings. In addition, State Governments have been asked to give the reports on utilization of funds through prescribed formats. Senior officers of the Ministry also make on the spot visits to monitor implementation of programs for the development of primitive tribes. According to the existing Central Sector Schemes, States/UT have to allocate requisite funds from the Central and Centrally Sponsored and State Plan Schemes for their socio-economic development. The funds provided under the Central Sector Scheme would be utilized only for those items and activities that, though very crucial for the survival, protection and development of PTGs, are not specifically covered under the existing schemes, for the development of PTGs. Excepting the Central Sector Scheme for development of PTGs, the States and UT have not been indicating the separate allocation from the Central and Centrally Sponsored and State Plan Schemes allocated for the development of PTGs.

Administrative and Legal Support

- ⑤ ✓ No specific legal and administrative support exists at the national level for the protection and development of the PTGs. However, certain States like Orissa, Madhya Pradesh, Andhra Pradesh and Maharashtra have established special agencies at micro level for their development.

- ⑥ ✓ The most important input for the programs of Primitive Group is a sensitive group of personnel who are dedicated to the job. The designating of a Project Administrator of the ITDP to look after the program in addition to his normal duties will not do. For each PTG, an officer of suitable rank may be appointed who should be selected with great care and the main criteria should be the sensitivity of the person, his ability to identify himself with the tribals and their problems and a sense of commitment for the development of poor tribals.

- ⑦ ✓ Most of the PTGs living in inaccessible hilly and forest area are not aware of Central protective measures such as SC/ST (Prevention of Atrocities) Act, 1989 and Protection of Civil Rights Act, 1955. State Governments should undertake special awareness programs amongst these groups and sensitize them about their rights and privileges and also disseminate information about the various laws meant to protecting their rights and ensure socioeconomic development.
- ⑧ ✓ Degree of participation of PTGs in progs is low on account of rigidity of social & cultural values prevailing among them. Moreover, there is a growing concern amongst various sections that the cultural heritage of the PTGs are getting eroded in the name of development. State Tribal Research Institutes and other Government agencies like department of culture should ensure that the cultural heritage of these primitive groups is preserved and disseminated. They should also ensure that in the name of modernization, PTGs should not lose their traditional livelihood resources.

Land Alienation

Due to impact of industrialization and displacement of tribals due to major projects, the traditional rights of the tribals which consist of access to forest and community property resources for hunting, fodder for cattle, gathering non-timber minor forest produce such as honey, gum, medicinal plants etc. from which Adivasis derive food and cash income etc. are eroded. Under Land Acquisition Acts of States, tribal lands are acquired for public purpose, which affects the rights of tribal people in their original habitation.

According to the information from Planning Commission, 85.40 lakh tribal persons including PTGs have

been displaced from 1951 to 1990. According to the Report of the Steering Groups on Empowerment of STs for the Tenth Five Year Plan, as many as 213 lakh people including tribals have been displaced due to various development projects since 1951 - 1990. About 21.20 lakh ST persons have been rehabilitated from 1951-1990 according to the Planning Commission.

Respective State Governments are adopting various measures for the displaced STs including the PTGs by providing proper rehabilitation packages like housing, land for agriculture, irrigation, drinking water, electrification, education and various other developmental activities under beneficiary oriented programs.

(*) Since most of the PTGs are shifting cultivators, special welfare schemes need to be taken up by ministry of agriculture etc., to ensure proper rehabilitation of these vulnerable groups under the special programs like Watershed Development Project in Shifting Cultivation Areas.

Special Assistance to ITDPs, Tribal Research Centers and NGOs for PTG Welfare

(Contd. from pg 316) Central Sector Scheme for PTG is one of the most flexible schemes since under it any activity for the benefit of the PTGs can be covered which are not specifically covered under any of the other schemes. State Governments and NGOs can implement the scheme. For this purpose, the State Governments or NGOs have to submit a proposal which is considered by a Selection Committee with representatives of the Planning Commission, the National Commission for Scheduled Castes and Scheduled Tribes and Integrated Finance Division, Ministry of Tribal Affairs to approve the specific proposals and recommend allocating funds for the development of the PTGs. The funds are thereafter non-divertible and have to be necessarily spent for the development of the identified PTGs as proposed by them.

The following are the details of the various programs implemented by ITDPs, Tribal Research Institutes (TRIs) and NGOs

ITDPs	TRIs	NGOs
<ol style="list-style-type: none"> Training program Health care program Income generation programs Safe drinking water Awareness generation program Village resource development works Forest Development works on useful sharing basis Minor irrigation Plantation of Medicinal Plants Watershed approach Human and Industrial development Promotion of Self Help Groups Soil Conservation Education Establishment of Green Houses Community Centre 	<p>MAA BADI - Children of age group 5-10 years are provided with midday meal, free uniforms, education and are motivated to adopt health and sanitation.</p>	<ol style="list-style-type: none"> Training programs Establishment of Self Help Groups Health programs Education awareness programs Income generation programs Repairing of old houses special coaching Educational awareness seminars Kitchen garden programs Village sanitation program Agro demonstration farming Health culture plantation Legal aid camp Women's reproductive health Safe drinking water Pre school education for girls

Monitoring is being undertaken by the Ministry through quarterly progress reports from the States/NGOs who are implementing the programs for the development of PTGs. The quarterly progress reports provide information regarding financial and physical achievements.

The Tribal Welfare Ministry provides financial assistance to State Governments and voluntary agencies under Central Sector Scheme for formation of Self Help Groups of PTGs and generation of awareness among them so that they may gain knowledge about Government programs and schemes and availing benefits under the scheme.

The degree of participation of PTGs in the activities/programs is low on account of rigidity of social and cultural values prevailing among them, low level of education and their settlements being isolated and lacking accessibility. Further State machineries are not making adequate efforts for their development. However, it has been noticed that where schemes specifically are being implemented by committed NGOs, they are coming forward in large number to avail the benefits of the scheme.

Health

Emphasis has been given on health and education in addition to economic generation programs under the Central Sector Scheme for development of PTGs. Under it 13 Mobile Dispensaries have been sanctioned in 6 States to provide facilities for health care of PTGs. State Governments/UT Administration are also providing health care facilities in the hilly and inaccessible tribal areas including the area inhabited by 75 PTGs. According to the information received from Planning Commission, 3258 Primary Health Centers and 20355 Health Sub-Centers are functioning in the tribal areas. The identified PTGs are also availing the health care facilities from these medical institutions.

The Ministry of Health and Family Welfare have launched a new scheme entitled "Medical Care for Remote and Marginalized Tribal and Nomadic Communities" during IXth Five Year Plan. An outlay of Rs.10.00 crore was provided under the IXth Plan Period for the scheme. The Scheme has been merged with the Indian Council of Medical Research from the Xth Plan. Necessary plan provision for launching the scheme was provided from 1998-99 onwards. Under the scheme, following projects have been taken by ICMR:

1. Prevention & Control of Hepatitis 'B' infection among Primitive Tribes of Andaman & Nicobar Islands
2. Intervention for hereditary common hemolytic disorders among major tribals of Sundergarh District
3. Intervention program for Cholera and Intestinal Parasitism, Vitamin A deficiency disorders among some Primitive Tribal population of Orissa.
4. Intervention Program for Nutritional Anaemia and Hemoglobinopathies amongst Primitive Tribal population of India.

In addition, a number of projects are underway by various governments and UT administrations to monitor and evaluate the health status of PTGs.

It is strongly recommended that adequate number of Mobile Dispensaries, Primary Health Centers, Sub-Centers, and Community Health Centers etc. that may exclusively cater to the PTGs should be set up in the areas of their habitation. It is desired that Project Directors of ITDPs should conduct health surveys among the PTGs regularly and ensure that medicines and other life saving drugs are made available on demand.

Education

According to 1991 Census the rate of literacy among the tribal communities was 29.60%. Female literacy was 18.10%. Among the PTGs, the average literacy rate is estimated at 10%.

Since introduction of new Central Sector Scheme for the development of PTGs, emphasis has been given on education in addition to other activities. However under State plan and centrally sponsored schemes,

State Governments and UT Administration have set up residential schools, hostels and ashram schools for imparting education. According to 1991 Census, 134 Districts in the country had less than 10% literacy among the STs women. Many of the PTGs are found in these Districts. Considering the importance of the role of women in tribal society, a Central Sector Scheme of Educational Complex in low literacy pockets is working in the States/UT. The extent of assistance under the scheme is 100% to the institutions/organizations set up by Government, which are autonomous bodies under a statute or as a society under the Societies Registration Act, 1860. In addition, NGOs working in the tribal area could also avail the benefit of the scheme.

In addition to important central and centrally sponsored schemes like educational complexes in low literacy pocket, boys and girls hostels, grants to NGOs etc. the Department of Education, Government of India through the State Governments have been implementing various incentive schemes to check the dropout rates among the STs especially the PTGs. The Tenth Five Year Plan has emphasized the development of education among the Scheduled tribes, especially the PTGs.

As regards the number of schools, hostels, ashram schools, residential schools etc. set up for imparting education to the PTGs, since 1998-99 under the Central Sector Scheme for development of PTGs, funds have been sanctioned for setting up of 7 hostels and 2 primary schools as education is one of the priorities for development of PTGs.

As these groups have primitive traits, a distinctive culture etc. they are not exposed to the modern environment due to their habitation in remote and hilly areas. The modern educational facilities have not reached them due to their strong cultural values and beliefs and as such, it requires lot of persuasion to make them accept services under the schemes and programs of the Government/NGOs. However, Governments are making efforts through awareness generation programs to provide them educational facilities at their doorstep.

(Figures in actual)

States/UTs,	Name of P.T.G.	Population			
		1961	1971	1981	1991
1.	2.	3.	4.	5.	6.
West Bengal	68.Birhor	-	-	658	855
	69.Lodha	-	45906	53718	68095
	70.Toto	-	-	675	-
	Total	-	45906	55051	68950
Andaman & Nicobar Islands	71.Great Andamanese	-	-	42	32
	72.Jarawa	-	-	31	89
	73.Onges	-	-	97	101
	74.Sentinelese	-	-	-	24
	75.Shom Pen	71	212	223	131
	Total	71	212	393	377
All India	Grand Total	773704	1403174	2042767	2412664

- ① Def by Gadgil :- Cumulative body of knowledge & beliefs handed down through generations by cultural transmission about the relationship of living beings including humans with one another & their environment.
- ② Def :- It is the knowledge systems embedded in cultural traditions of regional, indigenous (or) local communities.
- ③ Differs from Modern knowledge - in the manner of creation; TK is empirically validated in laboratory of life.
- ④ Significance : (i) ~~is~~ Indispensable for the sustenance & survival of community
(ii) Conserves ~~the~~ utilises the biological diversity via culture (stories, folklore, rituals)
- ⑤ Nature of TK - (i) dynamic (ii) Collective ownership (iii) transmitted orally Anthropology Paper 02 - Volume 03

PRIMITIVE TRIBAL GROUPS AND THEIR POPULATION IN INDIA FROM 1961 TO 1991

(Figures in actual)

⑥ Diff Aspect

(a) Agriculture, Animal care

(b) Human health

(c) Soil, water conservation, Mgmt

(d) Social n/w/s

(e) Ethno Astrology

⑦ Need to protect TK

(i) To improve livelihood of TK holders
(ii) To benefit national economy
Ex- Pharma, Agri, Biopesticides

(iii) Conserve environment
Bihar (Including Jharkhand)

(iv) Protect Bioprivacy

⑧ Efforts to protect

(i) TRIPS

(ii) CBD

(iii) TKDL - India

Gujarat

⑨ There is an urgent need to document TK w/ rapid pace of acculturation, urbanisation, modernisation which might

Karnataka

Kerala

States/UTs.	Name of P.T.G.	Population			
		1961	1971	1981	1991
1.	2.	3.	4.	5.	6.
Andhra Pradesh	1.Chenchu	17609	24178	28434	40869
	2.Bodo Gadaba	21840	25108	27732	33127
	3.Gutob Gadaba				
	4.Dongria Khond	21754	34382	39408	66629
	5.Kultia Khond				
	6.Kolam	16731	26498	21842	41254
	7.Konda Reddi	35439	42777	54685	76391
	8.Kondasavara		28189		
	9.Bondo Porja				
	10.Khond Porja	9350	12347	16479	24154
	11.Parengi Porja				
	12.Thoti	546	1785	1388	3654
	Total	123269	195264	189968	286078
Bihar (Including Jharkhand)	13.Asur	5819	7026	7783	9623
	14.Birhor	2438	3461	4377	8083
	15.Birjia	4029	3628	4057	6191
	16.Hill Khoria	108983	127002	141771	151634
	17.Korwa	21162	18717	219940	24871
	18.Mal Paharia	45423	48636	79322	86790
	19.Parhaiya	12268	14651	24012	30421
	20.Sauria Paharia	55605	59047	39269	48761
	21.Savar	1561	3548	3014	4264
	Total	257289	285719	325545	370638
Gujarat	22.Kolgha		29464	62232	82679
	23.Kathodi		2939	2546	4773
	24.Kotwalia		12902	17759	19569
	25.Padhor		4758	10587	15896
	26.Siddi		4482	5429	6336
	Total		54545	98553	129253
Karnataka	27.Jenu Kuruba	3623	6656	34747	29371
	28.Koraga	6382	7620	15146	16322
	Total	10005	14276	49893	45693
Kerala	29.Cholanaikayan		306	234	-
	30.Kadar		1120	1503	2021
	31.Kattunayakan		5565	8803	12155
	32.Koraga		1200	1098	1651
	33.Kurumba		1319	1283	1820
	Total		9510	12921	17647

- ① UN-GA adopted DRIP in 2007.
- ② UN says "it is an imp standard for ~~the~~ eliminating human rights violations against the planet's 370 million indigenous people & assisting them in combating discrimination & marginalisation."
- ③ DRIP codifies Indigenous historical grievances, contemporary challenges, & socio-economic, political & cultural aspirations.
- ④ Declaration has 46 articles : 1-40 are regarding individual & collective rights ; many include state obligations to protect their rights

Anthropology Paper 02 - Volume 03

(Figures in actual)

- Art-31 - right to protect cultural heritage.

States/UTs.

Name of P.T.G.

1961

1971

1981

1991

- 41-42 - role of UN

43-45 - rights to be applied without distinction to men & women

3. 4. 5. 6.

46-
Madhya Pradesh
(including Chhattisgarh)

34.Abujh Maria

11115 13000 15500 -

35.Boiga

- 6194 248949 317549

36.Bharia

- 1589 1614 -

37.Birhor

513 738 561 2206

38.Hill Korwa

23605 67000 19041 -

39.Kamar

- 13600 17517 20565

40.Sahariya

174320 207174 281816 332748

Total

209551 309295 564998 673068

Maharashtra

41.Katkari/Kathodi

- 146785 174602 202203

42.Kolam

- 56061 118073 147843

42.Maria Gond

- 53400 66750 -

Total

256246 359425 350046 -

Manipur

44.Maram Naga

- 5123 6544 9592 -

Orissa

45.Chukta Bhunjia

- - - -

46.Birhor

- 248 142 825

47.Bondo

- 3870 5895 7315

48.Didayi

- 3055 1978 5471

49.Dongria Khond

- 2676 6067 -

50.Juang

- 3181 30876 35665

51.Kharia

- 1259 1259 -

52.Kutia Khond

- 3016 4735 -

53.Lanja Saura

- 4233 8421 -

54.Lodha

- 1598 5100 7458

55.Mankirdia

- 133 1005 1491

56.Paudi Bhuyan

- 4424 8872 -

57.Saura

- 2845 2917 -

Total

30528 77267 58225 -

Rajasthan

58.Saharia

23125 26796 40945 59810

Tamil Nadu

59.Irular

79835 89025 105757 138827

60.Kattunayakan

- 6459 5042 26383 42761

61.Kota

- 833 1188 604 752

62.Korumba

- 1174 2754 4354 4768

63.Paniyan

- 4779 6093 6393 7124

64.Toda

- 714 930 875 1100

Total

93794 105032 144366 195332

Tripura

65.Riang

- 56579 64722 84004 111606

Uttar Pradesh

66.Buksa

- - 31807 34621

(including Uttarakhand)

67.Raji

- - 1087 1728

Total

- 32894 36349 -

UN-Def. of Indigenous

- Considering the diversity in various definitions, UN has not given ~~def~~ official def of Indigenous but rather ~~the~~ consider that most fruitful approach is to identify rather than define.

- Some ~~factor~~ aspects considered are

- ① Self-identification as Indigenous People at individual level & accepted by community as their member
- ② Historical Continuity with pre-colonial societies
- ③ Strong link to territories & surrounding natural resources
- ④ Distinct social, economic, political systems
- ⑤ Distinct language, culture, beliefs
- ⑥ Form non-dominant groups
- ⑦ Retain to maintain & reproduce their ancestral environments & systems as distinctive peoples & communities.

325

Join Us : Telegram : <https://t.me/nailedupsexam>

Def :- The Orgs involved in voluntary action, not under any authority wielding power of the State. Can be a NGO.

X Notes - (Page 5)

ROLE OF NGOs IN TRIBAL DEVELOPMENT

Democracy allows scope for the individual to undertake action in a national society, independent of the state. The "private action, that is to say, action not under the direction of any authority wielding power of the State, therefore, is called voluntary action". The organisations involved in voluntary action are thus the Non-Governmental Organisations.

On voluntary action for the public purposes, Lord Beveridge has observed as follows: "A voluntary organisation, properly speaking, is an organisation which, whether its workers are paid or unpaid, is initiated and governed by its own members without external control".

Definitions given by Mary Morris and Modeline Roof are also similar. Modeline Roof emphasises in addition that these non-governmental organisations should depend, in part at least, upon funding support from voluntary sources. On motivation for voluntary work, Mary Morris observes, "To lead a full life, most people need more than they can find in their work or home. They need to live as members of groups doing things for themselves and their fellow members or for the benefit of others outside the group. The urge to act in groups is fundamental to man".

Thus, voluntary action is a form of organising activities supporting, strengthening and helping to develop work to meet all types of legitimate needs of individuals and groups in a society.

Non-governmental organisations are supposed to be potentially superior to official agencies in three respects: 1) their workers can be more sincerely devoted to the task of reducing the sufferings of the poor than government staff; 2) they can have a better rapport with the rural poor than government employees; and 3) since they are not bound by rigid bureaucratic rules and procedures, they can operate with greater flexibility, they can read just their activities quickly and continuously as they learn from experience. We can add two more points: 4) Non-governmental organisations efforts are more economical than the government departments; and 5) they can motivate more public participation in development efforts than the government departments.

Voluntary Action for Development of Scheduled Tribes in Pre-Independence Period:

Voluntary action has a long tradition in India. The great forests of India have, for thousands of years, attracted men who desired to retire from the world and devote themselves to spiritual thinking. They were, we are told, kind and gentle to the animals and we may be sure that they were equally kind and gentle to the ancestors of the tribal people of today amongst whom they lived. In fact, when societies of the world were ripe with tribes and groups, India had her Manu, Yagnavalkya, Kautilya and Vyasa. Their approach to social problems was undoubtedly different. They thought of social security on a decentralised basis. The time, however, was not yet ripe for an organised system of education and health services.

Coming to the British period, we find that they isolated the Scheduled Tribes to keep them away from the national movement. Development of the Scheduled Tribes, to enable them to take advantage of the technological order of the modern civilisation, was never a matter of concern for the colonial administration. During that time it was the exclusive burden of the non-official agencies to look after the welfare of the economically, socially and politically backward tribal communities. Among the tribal communities, mention may be made of the humanitarian missionaries of various denominations. The missionaries were the pioneers in education. They opened the first hospital in the tribal areas. Some of them set a shining example by their care of lepers. Their devotion and self-sacrifice in the remotest hills and forests are cited even today as examples of ideal social workers.

Undoubtedly, the missionaries led the way in certain matters which all workers, official and non-official, would do well to follow. In many cases, by the translations of the Bible they first gave form to the tribal dialects, by the mastery of which they gained much influence on them. Secondly, once they went to a place they usually stayed there for a very long time and some of them actually took vows never to return to their own land. Thirdly, they were always accessible and friendly. They were among the first to inspire

the tribal people with the idea of progress and to awaken them to a sense of their rights.

4 ✓ Historically speaking, the American missionaries started schools in Naga villages as early as 1830. They also taught villagers the technique of cultivating tea. Coming to Chotanagpur (Bihar), we find that the advent of Christianity dates back to 1845 when four Lutheran missionaries sent by one father J.E. Gossner of Berlin reached Ranchi. Between 1895 and 1914 the Lutheran Church expanded considerably and alongwith the conversion work, they opened High Schools for both the boys and girls. Dispensaries were also opened at Ranchi, which rendered great service to the Christian as well as the non-christian public.

The Roman Catholic Missionaries are comparatively latecomers to Ranchi and the first organised mass conversion began with the advent of Fr. Constant Lievens in 1885. In the beginning, Christian Missionaries confined their activities to purely evangelical work but they got little success. It was, therefore, realised later that the only way to attract the tribals was to defend their interests, especially regarding their rights of land tenure and land services. After the missionaries took a few cases at Ranchi and won them, they established their reputation. S.C. Roy has rightly pointed out that in addition to helping the tribal peasants against the land grabbing devices of the non-tribal landlords, the Christian missionaries also provided them shield against the exploitation by the moneylenders. The initial credit goes to a prominent Catholic Missionary, Father Hoffman, for taking concrete steps to establish Chotanagpur Catholic Mission Cooperative Society in 1909. It had Central Cooperative Bank at Ranchi but it converted the whole of Chotanagpur, into several circles in different mission stations, which were again sub-divided into several units as working centres.

The Christian missionaries also took active interest in spreading education among the tribals and improving their health and living conditions. In the tribal belts of Orissa, Madhya Pradesh, Andhra Pradesh and other parts of India also, they carried on humanitarian activities on a considerable scale.

When the freedom struggle, launched by the national leaders, became stronger, they realised their concern for involving the tribals in their efforts in order to integrate them in the mainstream of the national life.

6 ✓ Under the impact of the Gandhian age - a very prominent member of the Servants of India Society, late Thakkar Bapa laid the foundation of another service agency. Like other pioneering projects, this also had a small beginning. He established in 1921, an Ashram at Mirakhedi in Panchmahal district and the Bhil Seva Mandal at Dohad in Gujarat - then a part of the old Bombay Presidency. By single-minded devotion and hard work, he established 21 institutions in various parts of the country, three each in Andhra and what is now the Madhya Pradesh, two each in Assam, Bihar, Gujarat, Maharashtra, Orissa and Uttar Pradesh, and one each in Kerala, Madras and Rajasthan. There was magic in his personality. He could create workers, attract workers and hold on to the workers - which is the secret of retaining the workers. Dhebar rightly opined that the history of a quarter of a century of dogged endeavour on the part of this singularly quiet and dedicated yet principled personality is a romance of social work in India.

✓ Activities of Thakkar Bapa and his band, prior to Independence, were mostly concentrated in the field of education and in some places in the field of public health. A noteworthy beginning was also made in the field of cooperation in Bombay Presidency.

7 ✓ The first fruitful effort for voluntary action was made in the tribal belt of Bihar with the establishment of a service centre named Seva Kendra in the year 1940. The immediate incentive for improving the socio-economic conditions of the tribes of Chotanagpur is linked with the holding of the All-India Congress at Ramgarh, 28 miles from Ranchi in 1939. The important national leaders like Mahatma Gandhi, Dr. Rajendra Prasad, Pandit Jawaharlal Nehru, Sardar Ballabhbhai Patel and many others, who met in the tribal setting, were deeply impressed to undertake the cause of development of the primitive and backward communities not only of Bihar but also of the whole country. As a part of the program of freedom fight, it was emphasised to take up the cause of the socio-economic development of tribals. Dr. Rajendra Prasad and his young collaborator Sri Narayanjee immediately started the work in Chotanagpur. In the thick tribal belt at Gumla at a distance of 40 miles southwest of Ranchi, they started a centre named Seva Kendra. Originally, they mobilised persons to take lessons in literacy in the night and to work in the Khadi

Production Centre. In order to run these two programs, financial help was made available from the savings of the Reception Committee of Ramgarh Congress.

8 ✓ In Madhya Pradesh, the Adibasi Seva Mandal was registered in 1945-46. At present, its head office, situated at Mahajpur in the Mandla district and from the very inception it has laid a great emphasis on the spread of education among the tribals. In addition to the educational programs, the organisation was managing one agricultural farm, three cooperative societies, one mobile dispensary, one Lok Karya Kshetra, and one Panchayat Raj Prashikshan Kendra.

- (b) ✓ Voluntary action, thus, in the beginning was motivated by religious consideration, people used to serve fellowmen in order to please God and acquire "punya". Voluntary action also took place outside the religious channels, especially during calamities like floods and famines. This system of mitigating problem of indigency by the particular norms of mutuality of obligations (as manifested through individual philanthropy and religious charity) had been continuing in India right through the 18th century. The growth of residential institutions, as instruments of organised and sustained care, is a 19th century phenomenon in the field of voluntary action in India.
- (c) ✓

Policy on Voluntary Action in Post-Independence Period: (Not necessary)

It was only after 1947 that non-governmental organisations had anything to do with the government. The government, on its part, not only started operating some programs of social welfare directly but also started a program of financial assistance to non-governmental organisations. In the 1st five year plan, a provision of Rs.4 crores was made for assistance to non-governmental organisations as these were found to be capable of "dealing with social problems for which the state cannot provide in sufficient measures" (First Five-Year Plan).

Right from
1st five year
plan

✓ In 1953, the Central Social Welfare Board was created with an allocation of 40 million rupees for grants-in-aid to non-governmental organisations. This was a pioneering institutional arrangement for mobilising voluntary effort by the government. In 1954, welfare advisory boards were created in states. With this, the concept of mobilising voluntary effort was decentralised and further decentralisation took place in the community development and panchayati raj institutions.

✓ Even before the government had come into the picture, the Andhra Mahila Sabha, first in Madras and later in Hyderabad, demonstrated the immense potentialities for mobilising voluntary effort through the zeal, devotion and sincerity of thousands of workers who were not at all career minded but dedicated to service.

In the 3rd Five Year Plan, importance of the role of non-governmental organisations for the successful implementation of our plans was reiterated as follows:

For a developing country that cherishes its democratic value, the people's part in the attainment of these objectives is of supreme importance. The peaceful struggle for freedom and tradition of constructive work associated with it had marked out for the people a decisive role in the tasks of planned development initiated 10 years ago. It is evident, however, that the possibilities of full involvement of the people in the processes of change and growth are not being realised to a sufficient degree.

Discussing people's participation on an ideological level, the plan document found it necessary to give it a concrete shape and observed: In the activities in which official agencies are engaged, there is a large sphere in which the cooperation of the people can be sought and secured to achieve a degree of success which would otherwise not be possible. These tasks should be identified precisely and the obligations and responsibilities of the people in relation thereto made known clearly. The concept of public cooperation is related in its wider aspect to the much larger sphere of voluntary action in which the initiative and organisational responsibility rest completely with the people and their leaders. So vast are the unsatisfied needs of the people that all the investments in the public and private sectors together can, at this stage, only make a limited provision for them.

✓ Thus, government, in the first two decades after Independence, adopted policy of working with voluntary organisations for promoting welfare of the people. The government also initiated the services provided by non-governmental organisations so that the programs undertaken by the government should be effectively supplemented. The grants-in-aid programs were evolved for providing certain measure of stability to non-governmental organisations for maintaining certain functional level of organisational and financial efficiency. It is, therefore, not at all amazing that non-governmental organisations have, over the years, expanded in terms of absolute number as well as the number of services covered by them, of course, with the financial assistance provided by the government. This made the situation somewhat complex. While in some fields certain services are being rendered by official agencies, in some other fields the same services are rendered by non-governmental organisations. Even in the same field, both official and non-official agencies have been found to be working. This raised the problems of uniform financial reporting and accounting by non-governmental organisations, and creation of a central intelligence service to keep track of funds received and spent by them. The other problem was regarding coordination of work done by non-governmental organisations and the work done by the government and the local authorities. Related closely to the latter is the need for coordination amongst the voluntary organisation themselves.

✓ Keeping these problems in view, Renuka Ray Study Team on Social Welfare and Welfare of Backward Classes recommended in 1959 that coordination councils should be set up at the district, state and national level. About a decade later, in the year 1967, another study team wondered as to where the non-governmental organisations stood and what was their role in relation to the state (or the government)? An attempt was also made to trace the ideological or conceptual basis of government funding of non-governmental organisations, failing which, it was observed that the prevailing situation does not give any clear-cut picture "whether the state wants these (voluntary) agencies to act as an assistant or helper to the government in its plan efforts, or as a catalyst to bring about changes in society by strengthening voluntary action".

Taking a broad review of the efforts during the earlier plan periods, the Sixth Plan observed:

During the last three decades social welfare services have grown both in volume and in ranges and the outlays have also increased.... The administrative machinery has also expanded and there is a better awareness of the developmental concept of social welfare.... A large number of non-governmental organisations are now being assisted to undertake social welfare programs in different parts of the country. In spite of these achievements, certain deficiencies in the programs, planning and implementation need to be remedied in order that effectiveness of social welfare schemes can be enhanced. There has been a tendency to depend on schematic patterns in the implementation of the schemes by Government or non-governmental organisations leaving little room for flexibility or ability to respond to the requirements and variations in local situations.

A study has been made about the unevenness of the growth of non-governmental organisations in different parts of the country. The study has come to the conclusion that:

1. In so far as the grants-in-aid programs are concerned, the Central funds have flowed more to the areas already having strong administrative machinery and infrastructure for utilisation of funds and the remote and backward areas have been left out more or less untouched.
2. Another lacuna that has been identified is the non-materialisation of the linkage of social welfare programs with economic programs. Many economic development projects have been launched, particularly in rural areas, without proper consideration of the social impact or the social service, and needs of women and children.
3. Monitoring of program performance of even important schemes continue to be in terms of financial achievements rather than physical performance related to the objectives of these schemes.

Voluntary Action for Development of Scheduled Tribes in Post-Independence Period:

After Independence, several such organisations have been formed in the tribal areas in different states that are working for the tribal development with the financial assistance of the government and public donations. Among these organisations, the most important is Bhartiya Adimjati Sevak Sangh, which was set up in 1948 on the initiative of Thakkar Bapa and was registered in 1949. Its objectives were: The development of the tribal communities in India, socially economically, culturally and educationally, with a view to enable them to take their legitimate place in national life of the country as equal citizens.

Dhebar report has rightly opined that it had played a small part in helping government shape its tribal welfare policy at the stage of preparation of the Constitution and thereafter the plans of development. Dhebar report mentions that apex institution had behind it, as affiliated or recognised institutions, 62 bodies; 10 in Maharashtra; 9 in Madhya Pradesh; 6 each in Andhra Pradesh, Bihar, Orissa; 5 in Assam; 4 each in Gujarat and Madras; 3 in Kerala; 2 each in Rajasthan and Uttar Pradesh; and 1 each in Mysore, West Bengal and Himachal Pradesh. Two are directly run by it - one in Assam and one in Manipur.

Work done by various Christian Missions has already been discussed. The Ramakrishna Missions are also doing commendable work, which we intend to discuss later on. The Central Social Welfare Board had also done good work in the Community Development Blocks in the fifties. Other important non-official agencies, covering tribal welfare in their programs, are:

1. The Servants of India Society,
2. Sarv Seva Sangh,
3. Gandhi Smarak Nidhi,
4. Kasturba Smarak Nidhi,
5. The Tata Institute of Social Sciences, Bombay,
6. The Indian Council of Child Welfare, Chhindwara and
7. Bharatiya Lok Kala Mandir, Udaipur.

The non-official agencies, including the missionary societies concentrated on education, provision of medical facilities, and, in western India, on Forest labourers' Cooperative Societies till sixties. Various non-governmental organisations in recent years are playing a significant role in advancing the social and economic progress of Scheduled Castes and Scheduled Tribes and other Backward Classes. Some of these agencies are working on all-India basis with grants from the Central Government while a few others, whose activities are confined to one or two states, are assisted by the respective state governments.

SOME IMPORTANT NON-GOVERNMENTAL ORGANISATIONS IN THE FIELD

Let us now briefly discuss the role played by some of the important non-governmental organisations in this regard since independence.

Bhartiya Adim Jati Sevak Sangh: The Bhartiya Adim Jati Sevak Sangh, founded by late Sri Thakkar Bappa, undertakes works for the welfare of Scheduled Tribes through its central office in New Delhi as well as through its affiliated branches in various states. During 1979-80, Government of India reviewed the scheme of 'Life Membership' and agreed to give grant-in-aid of Rs.6.42 lakh for scheme. Under this scheme, a cadre of 56 Life Members (20 senior, 12 junior and 24 volunteers) was evolved in the organisation, in addition to 13 life members already borne on the Sangh's Cadre. The life members were reported to have been posted in the remote tribal areas located in the states of Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Nagaland, Orissa, Rajasthan, Uttar Pradesh and West Bengal. During 1980-81, these life members have made very significant contribution towards the welfare of tribals by living in their environments, surveying their areas of abode and activities, to have first-hand knowledge about the

problems of the tribals and to find out remedial solutions to these problems. These life members work in close collaboration with the district authorities and are well aware about the day-to-day instructions of the government. They keep themselves up-to-date in the sphere of their activities.

In addition, during 1980-81, the Sangh continued their schemes of Training Centre at Rupa (Arunachal Pradesh). Concentrated efforts were made to cultivate the sentiments of national and emotional integration amongst the local tribals through various welfare programs. At Jhalod (Gujarat) the Sangh is running Gujarat Tribal Women's Training Centre to train women workers to undertake and implement child welfare programs and to do extensive work amongst rural and tribal women. At Srikakulam (Andhra Pradesh), the Sangh is maintaining a Tribal Kanya Ashram School, where tribal girls from Srikakulam district and its interior areas come for studies up to college stage.

1 **Nagaland Gandhi Ashram, Chuchugimlong (Nagaland):** Nagaland Gandhi Ashram, Chuchugimlong was established in 1955. The first activity taken up by the Ashram was a small medical aid centre. In 1977, a multipurpose medical relief camp was organised. Encouraged with the success, the Gandhi Ashram, in October 1979 started a Health Centre. Later on, a health service scheme on the lines of health insurance was designed. Under the provisions of the scheme, patients desirous to have treatment at the centre, have to pay a nominal fee of Rs.6 per patient per year. After the payment, a patient is entitled to OPD facilities at the centre throughout the year. Till March 1980 a total number of 224 members were registered under the scheme. Almost all the members belonged to the Scheduled Tribes of the State. A total number of 2,700 patients were provided medicines till the end of the upliftment of rural inhabitants of Nagaland and Chuchugimlong in particular. Commissioner of Scheduled Castes and Scheduled Tribes has rightly opined that judging from the success which the Ashram had achieved, it was desirable that the influence of good work started by Sri Natwar Thakkar and his Ashram should be extended and more and more such Gandhi Ashrams should be started in Nagaland and its surrounding regions.

2 **Ramakrishna Mission Ashram, Puri:** Taking the cue from Sri Ramakrishna's message "To serve Jiva is to serve Shiva", Swami Vivekananda, after his return from the West, formed on May 1, 1897 an association -- 'Ramakrishna Mission' which was got registered on May 4, 1909 under the Societies' Registration Act-XXI of 1860. It has 139 branch centres all over the world with the headquarters at Belur (near Calcutta), which are engaged in worship of God in man through various activities - relief and rehabilitation, medical services, educational work, work in rural and tribal areas, etc.

Ramakrishna Mission Ashram, Puri is conducting a Student's Home for the students belonging to Scheduled Castes / Tribes. During 1979-80 the total strength of the Students' Home stood at 65 out of whom 13 belonged to Scheduled Castes, 46 to Scheduled Tribes and the remaining 6 to the economically backward and other backward classes.

The Ashram under the "Type-Writing Training Scheme", imparted training to a group of 15 trainees under the guidance of a part-time instructor. Special coaching was also given to the students regularly with the help of the teachers appointed for the purpose. In addition, two other projects of Dairy and Bakery were also taken up. The dairy farm maintained by the Ashram provided practical demonstration in cattle rearing to the students and also provided milk to inmates. The Bakery imparted training to students in making biscuits, etc.

Ramakrishna Mission Ashram, Ranchi: The Ramakrishna Mission Ashram, Ranchi is running Divyayan (meaning the Divine Way) which was started in 1969 with three-fold objectives: economic, social and spiritual. Divyayan concept is one of total approach for the rehabilitation of man and the endeavour is to work at the grassroots level. With a humble beginning, it has now grown into a fullfledged training institute with a poultry (about 6,000 birds), a diary (about 45 cattle heads), a 3-storyed hostel, a workshop with modern equipment and machinery with a separate carpentry section, a mobilise audio-visual unit with film projectors, slide projectors, films, slides, VCR, TV, etc., and demonstration farms of nine acres at the centre plus 144 acres in the villages of Getalsud and Mahespur (P.S.Angara, District Ranchi) about 35 km. away from the centre, being developed for demonstration, seed multiplication research, social forestry etc.

In all, 3,776 farmers have been trained under on-campus program (till 1987) and 11,877 under off-campus programs, most of whom belong to backward communities of Chotanagpur. Impressed with the success achieved by Divyan in imparting skill-oriented training to the grassroots level farmers, Indian Council of Agricultural Research has recognised it as a Krishi Vigyan Kendra since 1977.

Ramakrishna Mission Ashram, Cherrapunji: The Government of India assisted the Ashram for maintenance of technical, middle, primary and J.B. Schools for uplift of the tribals living in remote areas of Meghalaya. Under the scheme, the Ashram maintained 46 schools. During 1980-81, there were more than 3,000 students on the rolls of these schools. Under the Dairy and Poultry Farming scheme started during the year 1980-81 for the first time, the Ashram is imparting training in modern dairy and poultry farming to the tribal youth. It also enables the inmates of Cherra and Shohbar Students' Hostels to get fresh milk and eggs that are very difficult to procure from the local market.

ROLE OF NON-GOVERNMENTAL ORGANISATIONS IN PLANNING, IMPLEMENTATION AND EVALUATION:

Non-governmental organisations can play a useful role in planning, implementation and evaluation of various development plans, which has been endorsed by various commissions. To begin with, Dhebar Commission opined as early as in 1961:

The raison d'être for successful functioning of a participating democracy is direct, active and purposeful participation of the people at all levels, in planning and implementation of welfare activities. This principle can be best served by assigning an important role to non-official organisations. It is necessary in any democratic framework that a measure of the constructive activity of the nation should be done under non-official auspices.

Sivaraman Committee, in its report on the role of non-governmental organisations, opines that non-governmental organisations, which are engaged in social and developmental work, especially in rural areas, can be profitably involved in planning and/or implementation of the integrated rural development program. The committee has recommended that, to begin with, non-governmental organisations may be involved in planning an implementation of about 100 block plans. It has further recommended that a high-powered committee should be set up at the centre which would select non-governmental organisations and the areas where they will work in cases where comprehensive block planning and/or implementation is to be undertaken by the non-governmental organisations. Coordination committees are also to be set up at the state level for selecting non-governmental organisations and the area of operation in case where part of the block plan is involved. It is understood that recommendations of the committee are under the consideration of the government.

It is, thus, clear that non-governmental organisations could be used to plan the program on the basis of real local needs and resources at the village and block level and be entrusted with execution of programs, which is urgently required for Harijan and Tribal Development. Thus, for instance, the Dantwala working group on block level planning calls attention to the fact that at the village level, the unemployed or underemployed prefer to remain so, if employment is offered to them in locations far away from their houses (this is more true about the Scheduled Tribes). This is the kind of situation which a voluntary agency takes into account in both planning employment programs and executing them in the village(s) concerned. Similar gaps exist in Training of Rural Youth for Self-employment (TRYSEM) program and in recently started RLEGPs, which through non-governmental organisations, can be set right, to an extent.

A study of the history of Harijan and Tribal development indicates that these two communities are mere passive spectators of the drama of development. However, development cannot be achieved unless beneficiaries themselves become conscious of their own rights, of the conditions and the circumstances which made them socially and economically disadvantaged and have an urge to alter the situation with proper understanding of the correlations of social-economic forces. The non-governmental organisations can make them active participants in the change process.

Group action and exogenous support is essential in IRDP for making correct selection of beneficiaries, choice of investment, getting the loans sanctioned in time and in making a reasonable income by overcoming the unfavourable market forces. A dedicated voluntary organisation could educate, conscientise and prepare the ground for collective action of the beneficiaries by making suitable intervention at all these points.

✓ Non-governmental organisations at national, state or levels down, could be asked to do evaluation of NREGA programs. According to studies made by some research institutions and even some official agencies, only 10 per cent of the Rs.500 crore funds allocated to the program in the three years 1980-81 to 1982-83, actually reached the poor families for whom it was intended.

Under these conditions, non-governmental organisations can help in monitoring IRDP^{NREGA} programs executed by government functionaries to ensure that the benefits reach the beneficiary for whom they are intended to the maximum extent possible.

Thus, there cannot be two opinions on active role of non-governmental organisations. It has many advantages; the plans are conceived and formulated on the basis of the felt-needs of the people, there is sizable saving in expenditure; implementation becomes easier; and finally people's aspirations are largely met. Dhebar has rightly said that they can also become the training-ground of social service workers on a mass scale.

NEW TRENDS FOR NON-GOVERNMENTAL ORGANISATIONS IN TRIBAL DEVELOPMENT

No doubt non-governmental organisations are doing appreciable work for Harijan and Tribal Development, yet there are still certain areas of Tribal Development where even greater involvement of these is needed. They are as follows:

- ✓ 1. Ignorance about tribal customs and traditions about land holdings in certain areas has resulted in wrong recording in surveys by settlement authorities resulting in transfer of title of their land. It is giving rise to tribal discontent. Voluntary organisation should take this matter in their hand.
- ✓ 2. Estimation places the total number of bonded labour, both tribal and non-tribal, in the country at about 32 lakh. Attempts were made to identify tribal bonded labourers during the first four years of the Sixth Five-year Plan. In the large tribal states of Bihar and Madhya Pradesh, identification was noticeably poor. It would be of interest, therefore, to see the contribution of non-governmental organisations in identification of bonded-labour. The Program Evaluation Organisations study included this aspect.
- ✓ 3. The 'bottle' has acted as an important conduit through which the wily forces of exploitation have long been entering tribal areas. Sanskar Kendras to ban the tribals from drinking on the pattern organised in the State of Gujarat should be introduced in the tribal areas in good number through non-governmental organisations, who may be assisted cent per cent by special central assistance.
- ✓ 4. There are 72 primitive tribal groups in the country with an estimated population of 14 lakh. There is a need to carry out ecological study of each one of these primitive tribes highlighting their pattern of distribution in space, adaptive process in their social organisation, economic activities, their world-view vis-a-vis physical and social environment, social organisation of labour, time budgeting, etc. Each of these aspects requires to be studied in detail for preparing a blueprint for their future. There has been an emphasis, since the Fifth Plan period, on preparation of a project report for each of these groups relative to its situation. Nevertheless, there has been considerable neglect in this regard. Apart from continued misery of conditions in which they live, risk of extinction of some of these tribes is not unreal. The extremely onerous and delicate dimensions of the problem of primitive tribal groups inclines us to the belief that public and non-governmental organisations should share the responsibility of the care and nursing of primitive tribal groups along with governmental agencies. The non-governmental organisations should come forward to accept the challenge in this regard.

10- NGO, can be used to carry dev efforts to target women.

5. It has been estimated by the Task Force on Shifting Cultivation, set up by the Ministry of Agriculture that approximately 9.95 million hectares in the tribal and hilly areas of the country are under shifting cultivation. The problem cannot be lightly brushed aside as over six lakh tribal families depend on this source for their living. This problem could be tackled easily if the non-governmental organisations adopt a program of educating the shifting cultivators on advantages of settled cultivation, which should be taken up along with implementation of the settlement/resettlement schemes.
6. There is a concentration of industrial and mining activity in the tribal belt of the country. The abrupt juxtaposition has produced traumatic results for the tribals. Instead of having benefited from the new ferment, the tribals have suffered loss of land and forest. Some of the cottage, village and small industries commonly in operation in the tribal areas, which need encouragement, include: a) forest-based small industries, and b) mineral-based cottage and village industries, weaving, sericulture and others. Arrangements for marketing could be done through various non-governmental organisations.
7. Various studies have revealed that developmental efforts have not reached tribal women. The tribal women should be encouraged to set up 'Mahila Mandals' and 'Mahila Samitis' and such organisations should be taken into confidence during planning and implementation of their welfare/development programs. On an experimental basis, reputed voluntary women's organisations will have to be identified and entrusted with selected programs.

AN EVALUATION OF THE NON-GOVERNMENTAL ORGANISATIONS

When we try to evaluate the role of non-governmental organisations, we are faced with a lot of controversies about their performance. There are two diametrically opposed views about them. For example, Mohit Sen views, "It is wrong and even harmful to rely on non-governmental organisations even partially for the implementation of plan projects, especially directed at poor millions". Kamal Narayan Kabra opines, "Like so many false alternatives being propagated to so many genuine issues, the officially recognised, financed and co-opted non-governmental organisations will prove another anarchism and false alternative". On the other hand, we have a long list of politicians, academics and social workers who have lauded their role for development of the weaker sections. For example, the Prime Minister's directive to Chief Ministers in October 1982 to involve non-governmental organisations in development by forming consultative Groups and the current move by the government to set up a National Council of Rural Non-governmental Organisations are all signs of change for better in the official attitude towards non-governmental organisations. Planning Commission members, C.H. Hanumantha Rao, and Raj Krishna and social workers like Mahasveta Devi and many others have made a fulsome praise in favour of non-governmental organisations. No doubt, there are good and bad non-governmental organisations. For example, we may visit Narendrapur in Calcutta and Coimbatore, amongst others, doing silent work of training, with echo around, under Ramakrishna Mission. Nilokheri, situated on the National Highway, 150 kilometers north of Delhi, with its rural-cum-urban township and the quest therein soon after 1947 for a "road to new India" is another example of voluntary action by many a volunteer totally committed to the cause and supported strongly by Nehru despite opposition from within government and without. What SEWA has done in Ahmedabad is something that a government agency has not have been able to do. What the Tagore Society for Rural development is doing in 27 villages in five islands of the Sunderban area in West Bengal is an unlikely proposition for a bureaucratic and hierarchical state agency. The examples, but a few, cited in the foregoing, are illustrative of what can follow when the 'cause is honest', and there is integrity, inspiration and fire from within.

We have another example too. S.K. Dey has mentioned about some of the activities of Sarva Seva Sangh. He writes: It was decided to have a pilot project under the Sangh in the backward district of Koraput in Orissa, where eight tribal blocks had already been covered by 'Gram Dan' to 'Block Dan'. One of the Blocks was taken under the unfettered charge of the Sangh with full resources, but staff appointed exclusively by them. A year passed. The entire resources had been spent out. All that happened was that the Block Development Officer selected and appointed exclusively by them out of their own youth group, had established as Ashram for himself immeasurably better fitted and equipped than Gandhiji's own at

Sevagram....A vital young Adibashi girl of rare beauty found her place to look after the Ashram and its occupant....There came also a big store house for jungle produce with hardly 5 per cent of space occupied. When the doings were reported to the Sangh, the young man was removed. The joint program also came virtually to an end.

- ✓ The works of the foreign Christian Missions are also not an unmixed evil. One may see a village, which at one time worked and lived as a single unit, now split into a Christian hamlet and a Non-Christian hamlet. Dhebar report mentions about a village where no fewer than five Missions were carrying on propaganda, opening separate schools and teaching different forms of Christianity.
- ✓ These days, government is facing some difficulties from foreign non-governmental organisations, particularly in scheduled areas. It would be desirable to subject the foreign assistance received by such organisations to strict check before permitting its utilisation in tribal area program. Chief Editor of Yojana has also opined, "Mysterious, they say, are the ways of the unseen band that backs them". We should be careful not to encourage development rackets in the name of people's participation and involvement of non-governmental organisations.

CONCLUSION

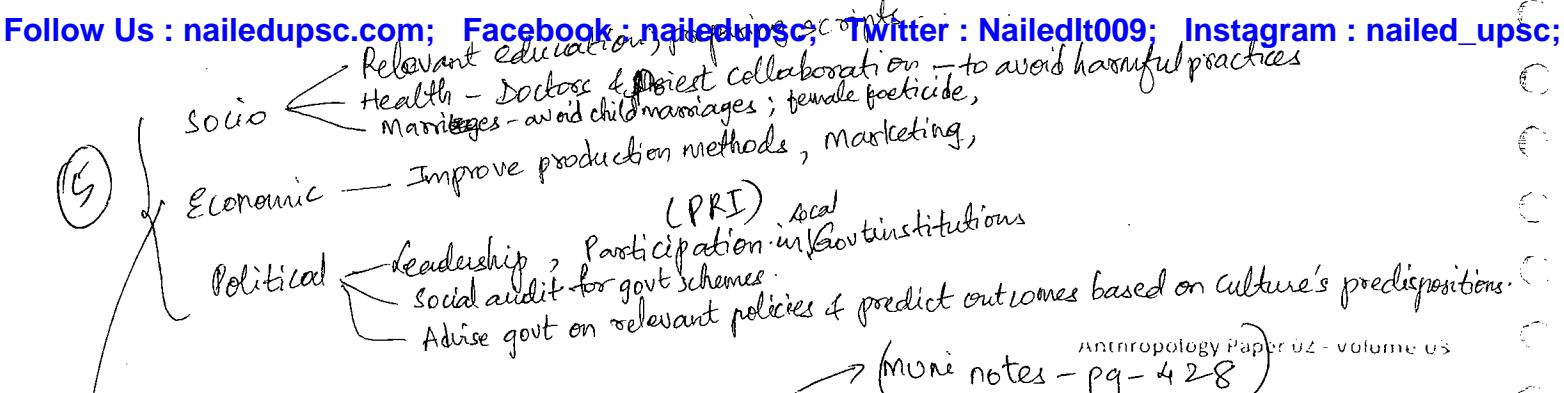
- ✓ After assessing the role of non-governmental organisations for Tribal and Harijan development, we come to the conclusion that they have come to stay. The United Nations Children's Fund report opines, "All over the world, non-governmental organisations (NGOs), both national and international, are active partners of communities and governments in their efforts to protect the health and normal growth of their children.... World-wide, it has been estimated that more than 3,000 international NGOs are at work, and they mobilise more than 2.3 billion every year for assistance to the developing world". A devoted governmental agency can certainly do the work of development to some extent, but if it had the support of the non-governmental organisations, it could do the job much better. We have seen from experience during the last three decades that 'Rashtra Shakti' or government action by itself could not achieve much unless 'Lok Shakti' or 'Jan Shakti' supported it.

The State's agency bureaucracy would require sensitisation, which could come through very largely, if it were made to work along with non-governmental organisations. Beyond doubt, the experience all over the world is that non-officials could communicate to people with greater understanding and conviction than officials.

There are people who charge that there has been misuse of funds by non-governmental organisations. There is some truth in it. But the amount misused is likely to be much smaller in the aggregate than the vast amounts wasted by government agencies.

With the adoption of new strategies for the economic and educational development of Scheduled Castes and Scheduled Tribes during the Sixth Plan, it has now become more important to involve voluntary organisations fully in this gigantic task. Non-governmental organisations are now gradually coming forward to take up various developmental programs for the Scheduled Castes and Scheduled Tribes. The decision has to be taken about the type of programs to be entrusted to such organisations during the Seventh Plan so that there may be a clear-cut demarcation of areas of operation between the programs undertaken by the State Governments and those entrusted to the non-governmental organisations to avoid duplication.

It cannot be denied that the entire backward rural areas of the country cannot be covered by the non-governmental organisations. But at the same time, it has also to be accepted that the government organisations could not reach these areas completely. There is, thus, no other alternative to this government-voluntary agency partnership for the crusade against poverty.



9.2 ROLE OF ANTHROPOLOGY IN TRIBAL AND RURAL DEVELOPMENT

Rural Dev

3

There is a growing importance in the present day to understand the cultural factors in the field of technological change and rural community development in many underdeveloped and developing nations of the world. Even a very small community development program and technological or economic innovations have latent cultural and social dimensions that need careful consideration if the success of these programs is to be assured.

The agencies involved in community development programs today are no longer approaching an underdeveloped community with a naive assumption that it will enthusiastically adopt superior tools and techniques when they are placed within its reach. Today these agencies are laying considerable emphasis on adapting modern techniques to the culture and values of the community in which the program has to operate.

(1) The cultural factors confront every step of the development projects and programs of technical assistance. Cultural predispositions, attitudes and social organization of the community govern the acceptance of the developmental programs and also the media through which these programs and programs endeavour to communicate.

(2) These cultural factors include a variety of complex cultural beliefs, simple habits and accepted social practices, intricate patterns of values and attitudes and also the social structure. The range and effect of these cultural factors on the community development projects are highly influential in its success.

(3) (i) Many programs are rejected not by people, but the innovations don't fit into the cultural setting. First, the habits and the tastes of the people determine the initial response of the community to a large number of innovations and programs promoted by the community development programs. For example, an improved variety of wheat may not be accepted by the community because of its flat taste. It may not be accepted also because of the difficulties the women experienced in using the new flour to make the conventional type of unfermented bread. The superiority of the new seed in respect to its proportionately higher yield, disease-and rain resisting qualities and better marketability, may be generally accepted, but when it comes to making a choice on grounds of taste, flavour, and digestibility, the preference would unmistakably be for traditional variety.

The force of habit also influences the attitude towards programs in areas other than food production. The construction of the public latrines in one of the projects in western district of Uttar Pradesh was initially welcomed as a progressive measure in the direction of urbanization, but their use was practically abandoned after a few weeks as they were not agreeable to the habits and aesthetic sense of the people. Similarly the construction of wells as a part of community development programs may not be welcomed due to the reasons of the change in the posture and motions in drawing the water and also because of the necessity of waiting for one's turn to draw water from the well.

(4) (i) When it comes to established practices, neither appeal on scientific grounds nor logic can easily persuade the village people to give up their traditional life ways. It would be apt to illustrate one of the failures of the community development programs due to the above reason. As a part of the rural sanitation program the village level workers got compost pits dug outside the settlements in a number of project villages. In this they had, on the whole, understanding cooperation from the people; both for aesthetic reasons and for reasons of public health, villagers thought it desirable to have pits for the deposit of manure and refuse outside the village, and cooperated willingly with the project authorities in digging them. The local village councils passed resolutions making it obligatory for the villagers to use these pits. Depositing refuse in the village was to be punished by the councils with fines. However, most of these pits remained unused. Cultural factors explain the failure on the part of the people to use these pits.

Traditionally it is the work of women to clean the house and cattle shed and deposit refuse and dung in one corner of the house compound or in an open space near the house. While women of even the highest castes can do this kind of work at their homes, but higher castes are not expected to be seen carrying loads from their houses all the way to compost pits on the outskirts of the village. Men could not do so,

Rural sanitation
prog of CDP failed
in spite of sound
logic and huge
scientific appeal

107

Contribute to analysing critical issues of national development & try giving solutions with a sense of urgency.

→ Contribute to sustainable & inclusive development of the country.

Anthropology Paper 02 - Volume 03

because culturally such a task is defined as "women's work". As very few families could afford to engage servants for this work, the traditional practice continues.

Cultural factors governing traditional work patterns determine the nature of public participation in many sectors of development activity. The government's efforts to mobilize local manpower in village reconstruction and development have received wide publicity. Shramdan, or the gift of free, voluntary labour by the people, is viewed as an effective instrument of securing the people's cooperation in constructive activities. Observation and analysis of these Shramdan drives in community development projects forcefully bring to our attention how the established work patterns of a community can defeat the very essence of such movements. In the villages under the development project, the upper caste groups traditionally assume supervisory roles, leaving the actual hard work to the poor lower caste groups. It was usual for the influential men in the village to use pressure on the lower castes to make them undertake the hard work in all communal undertakings of the village such as repairs to roads, cleaning of wells and construction of public buildings. The shramdan drives, inaugurated with great fanfare and considerable speech making, were in practice reduced to the traditional work patterns; the rich and influential upper caste people contribute their labour in the form of supervision, advise and encouragement, the lower castes did all the work. As no payment was made to them for the work, the low caste labourers naturally resented it. Another related factor may also be mentioned here. While in some other parts of India, women with the exception of those from high castes, join work teams engaged in community undertakings, because of their traditional seclusion in this area they cannot participate in such work.

The established social practices of the community affect the educational programs of the community development projects. The value of education is recognized and projects in this field get considerable verbal support from the people, but practical difficulties become apparent once these projects get started. The idea of an adult education sounds good but few adults want to adopt the role of school going child and enrol in these classes. The few who do join these classes also eventually give up because of the general amusement their position arouses. It must be remembered in this context, the community development projects are dealing with a population which is very sensitive concerning matters of honour and unwilling to risk any ridicule. A daughter-in-law is customarily not expected to leave the house frequently until she attains a comparatively responsible status within the family by becoming the mother of two or three children. When she is young, her role as "daughter-in-law" prevents her from joining these classes and when she has children her "adult" role coupled with responsibilities of the household prevents her from taking the advantage from them.

The ideal of ownership and management of farms by the family or close kin is so firmly established in the community that innovations seeking even slight modifications in the pattern are resisted by the people. The programs for planting community orchards sponsored by the community development projects, was largely a failure in India because no one thought of it as a serious and worthwhile investment. The impersonal nature of the ownership and the local traditions with respect to ownership aspects of the society, these programs are a general failure.

Resistance can be expected when program of change touch the sensitive area of belief. For example, the Government has been actively promoting programs of introducing better methods of cattle breeding, but with little success. The agriculturists recognize the importance of good cattle and invest large amounts of money in buying pedigree animals. But locally they cannot do much to change the methods of cattle breeding because of the presence in the villages of a large number of bulls. The government distributes a number of pedigree bulls in the area, but they are not much help because no effective ways can be devised to dispose the local bulls. Being the mount of Lord Shiva, a bull is regarded as sacred. Because of their sacred character, interference with their freedom is regarded as sin and plans to sterilize them are viewed as unthinkable by most villagers. The artificial insemination centers opened by the government have also suffered because of these problems.

Traditional practices rooted in beliefs can be obstacles to the acceptance of a wide range of programs in the fields of rural health and hygiene and practices connected with maternity and child care. The views of

4
G.
Stabilisation of cattle -
they are vehicles of God.

the people and the culture about the concepts of health, diseases and illness, determine their response to the various health programs. For example, notwithstanding compulsory vaccination, small pox or measles are considered as "sacred" disease. Because the people regard smallpox as the visitation of the mother goddess, villagers give more attention to the performances of the prescribed rituals and worship than to the proper isolation and care of the patient. In addition to this, certain types of diseases are attributed to supernatural forces and powers. Popular beliefs embodied in prevalent theories of disease and treatment not only determine the response of the villagers to the promoters and practitioners of modern medicine and their methods of diagnosis and treatment, but are of vital significance for the success of the programs of preventive medicine and immunization. Adoption of modern practices in maternity and childcare are also governed by some deep seated beliefs of the people.

There is a complex interplay of factors, affecting the programs directed towards the change, in the area of social structure. In this sphere it is necessary to take account of

1. Social segmentation and social stratification
2. Role differentiation in terms of age and sex
3. Types and levels of leadership
4. Vital factors of group dynamics and factionalism

The division of the society into castes, with their associated norms and expected standards of behaviour and overt stresses and tensions in inter-group relations, posed a number of important problems to the planners and development workers. The development workers at the cutting edge level are always posed with problems which force them to dilemma. Questions like with what particular group should they identify themselves in the village? Whose norms and standards of behaviour should they adopt, always confuse them.

If the development worker identifies himself with upper income and status groups and accepts their norms, he wins a certain measure of support from these influential groups. But at the same time it alienates the underprivileged groups and the promoters of change. The lower caste members look at the extension workers with suspicion and distrust and complain the government in planning to make the rich to get richer and thereby directly contributing to further economic deterioration of the lower levels.

If the workers associate themselves with the lower caste and underprivileged groups, they meet with coldness and even hostility from groups on the higher levels of the social hierarchy. Even the caste of the extension officer adversely affects his acceptance and also the success of the development programs. His behaviour is closely watched and any distortion from the traditional norms arouse interest and comment in the society.

The community development programs are also influenced by the role differentiations in terms of sex as well as kinship status and general socio religious status. Age in traditional India is the most important determinant of leadership. Age and experience are considered as necessary attributes of positions of leadership and influence. As a consequence of this norm, measures initiated by the project always need the blessings and support of the more tradition bound elders. Projects initiated and run by the younger age groups are viewed as temporary developments of minor significance and are rarely taken seriously by the community. This seriously affects the selection of the local agents of change and initiation of projects with long range effects.

(5) *Alegist can help
see back* An understanding of the levels of leadership and of the specific roles of different types of leaders is vital for the development programs. In the rural areas, certain types of persons having urban contacts, especially contacts with administration and political leaders, occupy a strategic position. Yet it would be a mistake to single them out as local agents of change to the exclusion of other levels of leadership. It is always the elite and individuals occupying existing positions of power, especially in elective offices which are looked upon by the common village people as a link between them and the urban world of

administrators, politicians and businessmen and consequently they come to have a somewhat specialized role in village affairs. For the reasons of local prestige, the elite group identifies itself more with the officials and with city ways than with the villagers and traditional way of life. Because of this attitude they alienate the more traditionally minded villagers who do not accept their leadership. For the effective penetration to the grassroots, the promoters of change will have to find out the key individuals who function as decision makers.

Village factionalism often puzzles development workers and failure on their part to understand the group dynamics in the rural communities under their charge, often leads to the ultimate failure of their desirable and technically sound projects. By narrowing down their search for "village leaders" to function as the local agents of change and community development to the rural elite, the extension agents and development workers indirectly worked to restrict the appeal and benefits of their efforts to certain sections of the village populations only. As another outcome of this policy, in some villages of the development block certain sections of this favoured group developed some vested interests and tended to block those aspects of community development activities that appeared to them to be helpful to their rivals and antagonists in village affairs.

In the area of attitudes, values, worldview and social relations we come to grips with cultural determinants that shape the course of development projects and decide their outcome most powerfully.

In respect to attitudes, it is necessary to consider the village people's view of change.

1. Do they consider it necessary and desirable?
2. Do the people trust the promoters of change?
3. Do they have any misgivings about the promoters' motivation?
4. Does the community regard the individual development projects as useful and beneficial?
5. Do they find methods devised for their adoption by the community acceptable?

There is expectancy of change among significant sections of village people, although there is general uncertainty about its nature and outcome. However, regarding the promoters of change and their motivations, there are considerable misgivings. Very few people have grasped the national significance of the development plans. Some people read hidden political motives in these plans. To a large number of people this activity is nothing more than a passing fancy of the government to ensure success in the next elections.

The common view regarding the development workers is that they work to justify their salary, not for any motivation. The relations between the common village people and government officials are characterized by considerable distance, reserve and distrust. The people have little share in determining the development projects or in executing them, nor do they have too much of an opportunity of learning to do so.

Values play a major role in determining the people's attitude towards programs offered to them by the community development projects. The village people's code of family is dominated by ethics like working for the prosperity, well-being, good name and enhancement of prestige of the family. Programs contributing towards the material prosperity of the household are therefore taken up without much resistance. Several items of the agricultural extension programs have been accepted on the basis of their possible economic rewards. Education is regarded important in the rural communities and hence construction of schools gets appreciable support from the villagers.

The planner and promoters of development programs have to take the account of a number of other manifestations of culture. In the first place, it is not enough to look for the immediate cultural consequence of an innovation in one aspect of life; its extension into other spheres is equally important. Then its secondary and tertiary effects cannot be ignored. The vital cultural linkages existing between

Anthropology Paper 02 - Volume 03

different aspects of life almost immediately carry the effects of an innovation to spheres other than the one in which the change was introduced.

It is also essential to watch the extreme selectivity and differential acceptance of the items of change offered by the development projects at different levels of the community. Closely allied to this factor is the tendency in cultures to reinterpret the preferred innovations in terms of the dominant themes and existing needs of the society. Usually there are selective trends in the acceptance of projects seeking to bring about modifications and changes in the society.

In the conclusion it may be said that in devising action programs of community development, especially in their educational aspects, it is necessary to keep in mind the cultural factors that vitally influence their acceptance or rejection by the people. Many programs are rejected not because the people are traditionally minded, conservative or "primitive" but because the innovations in all their ramifications do not fit into the total cultural setting of the community. A balanced and critical evaluation of the motivations and mechanism of the change in these societies, together with the analysis of the cultural determinants of acceptance and rejection, can provide fruitful insights towards better planning and execution of developmental programs.

When India attained independence, the climate was not propitious for anthropology. Anthropologists were held suspect because of their identification with the policy of exclusion and partial exclusion of tribes, which, according to nationalist opinion, was the manifestation of the imperialist policy, of divide and rule.

Those involved in tribal welfare were conscious of the need to understand tribal life and its problems in order to be able to formulate meaningful programs for their development and implement these programs effectively. For this, the Anthropological Survey of India came up.

In the first 27 years of independence, anthropology as a discipline has grown widely with 17 University Departments of anthropology, a dozen Tribal Research Institutes, a number of research organizations. Anthropology has gradually found some place in agricultural, medical and engineering fields. The discipline, once encased in the Tribal shell, and devoted almost exclusively to monographic tribal studies, began exploring new frontiers. Now the anthropologists have focussed their attention to rural studies, urban problems, and other sociological problems in India.

According to S.C. Dube, while planners and administrators must share the primary responsibility for the formulation and implementation of rural development projects, social scientist could give them invaluable help in the areas of social organizations, human relations, culture and values touched by the plan.

S.C. Dube
In this context, the role of the social scientist, especially the anthropologist, must essentially be viewed as that of an analyst and not that of a therapist. Dube sounds a necessary warning about the dangers in overselling anthropology and in making high sounding and impossible claims for them as science of "human engineering". But he rightly emphasizes the very useful role this discipline can play as important subsidiary to planners and administrators.

In the context of C.D., the role of anthropology is emphasized because of the following sociological assumptions the community development movement has:

1. Individuals, sections, groups and strata forming the village community have a large number of common interests, sufficiently strong to bind them together.
2. The interests of the various groups and classes within the village are both sufficiently alike and common to create general enthusiasm as well as a feeling of development for all.
3. The interests of the different sections of the community are not irreconcilably conflicting.
4. The state is a super class, impartial, non-partisan association and that the major policies of the

government are of such a nature that they do not further sharpen the inequalities between the existing social groups.

5. People's initiative and enthusiasm and active participation are possible in the extant village communities because they have common interests.

It is only an anthropologist who can critically enquire as to whether these assumptions about the village communities in India and Indian State and its governmental policies are valid or not.

In the context of tribal development, we can say that anthropologists can help to identify the problems with tribal experience and point out the ways in which change can be introduced with least disruption of their culture and traditions. Whereas anthropologists have contributed to a greater extent on a majority of aspects, both in tribal and rural societies, they have not given considerable contribution to leadership studies. They have studied this problem from a limited angle. They have not found out the role of Panchayats, and who are the Panchayat leaders. However, the importance of understanding the community as a whole, its general cultural patterns and its social, economic and political structure is felt. This latter point is emphasizing the relevance of anthropology in development and policy.

In the context of methodology of the anthropologists, certain points have to be taken into consideration. Their attachment to foreign conceptual models and research tools has been pathetic. They have tended to work in areas that are at renowned centers of learning abroad, adopting their conceptual framework and methodological apparatus without any serious consideration of their Indian context. Of course, they do not have to reject a conceptual framework or a research technique only because it is "foreign", but they have to ensure, at the same time, that their attachment to it does not obscure from their view the problems that really need to be investigated, and that it does not circumscribe their thinking on the subject and compel them to use tools of doubtful utility.

In any scientific endeavour, the researchers should not be dogmatic to use only his own concepts and methods, but they must guard against their minds being conditioned in a manner that distracts them from issues of national relevance and inhibits the evolution of methods appropriate to the Indian setting. The methodological development will give sufficient means to the anthropologists to show their utility in different social programs.

The following points can be borne in mind for future course of action, especially in different applied fields.

1. The anthropologists should not be too rigid from the angle of his discipline. In the world today, the problems to be investigated matter much more than the disciplinary labels under which research is conducted. These problems are best investigated through interdisciplinary perspectives and research procedures.
2. One of the basic weaknesses is that they are not asking the right questions. This emanates partly from their dependence on foreign models and partly from their tendency to initiate the fashion of the day. Before plunging into research they should clarify themselves sufficiently that the subject taken up is the real problem of the society.
3. On the basis of the micro studies they should go for macro generalization and not micro generalization, which leads the researcher into wrong solution and proposition.
4. There is a lot of demand for the autonomy of academic pursuits. One could certainly do so if one did not expect any support from public funds, but once public funds are introduced the principle of social accountability becomes operative. It is certain that barren academic exercise is not the purpose of social sciences; for it has to be socially relevant and useful. The esoteric cult attitude has led anthropology to its present predicament in India. On the one hand anthropologists lament their neglect in the policy-making processes of the country, on the other, in response to every significant question they demand time and money for more research. This offers little comfort to planners.

When money is eventually found for further research there are no policy oriented analyses and propositions.

5. There is a regrettable absence of meaningful social criticism. Some intellectuals maintain a posture of permanent dissent; others appear to be perpetually angry. Dissent and anger have their utility, but they are not the only functions of the intellectual. It is not enough for a social scientist to proclaim that everything is going wrong. For that is easy and does not require any social science vision. Social science research has to pin point the areas in which things are not happening the way they should and it must seek to explore why and how that is so. Hopefully, it should be able to suggest what can be done to improve the situation.
6. The institution should be developed on the basis of problem solving. The institution like Anthropological Survey of India has not made the impact that was expected of. The other tribal research organizations are still going on finding out the primitive way of life of the tribals not the problems concerning the tribal population in India.

★ Indian anthropology must be relevant and committed anthropology. It should be relevant in the sense of taking account of critical problems and of nation building and economic research with vigour and determination to enlarge the vision of the policy maker in regard to issues and problems that need to be attended with a sense of urgency.

If anthropology has to adopt and play such a role it will also have to take steps to ensure its inner growth by enlarging and sharpening its analytical and explanatory capabilities.

The most important problem before our country today is that of transforming a capitalist agrarian structure into a modern industrial one. In doing so, this anthropology can indicate hopefully, the means by which the ills of imbalances and disharmonies that have permitted the existence of poverty in the midst of plenty.

Anthropological research will have to relate itself to the diverse problems of poverty, in their widest ramifications and in depth. They shall have to concentrate attention on the weaker sections of the population, especially on the STs and SCs, whose welfare and development are a constitutional obligation of the Government. The SCs and STs are by no means the only weaker sections of this country. There are many others who are equally poor and exploited and who do not even have the protection that has been accorded to the two segments mentioned above. What about them? They also have to rise above subhuman levels of existence. Do we have any studies on their problems? Even after 48 years of independence these poorer sections are far below the mainstream of the Indian society.

To conclude, what we are suggesting is a relevant anthropology, which concerns itself with the major challenges facing Indian society today and involves itself in shaping the future with rapid economic growth. As Gunnar Myrdal has opined "the socially irrelevant social science was existing and will not exist simply, it will fade away in the course of time".

Conclusion

9.3 Contributions of Anthropology to the Understanding of Regionalism, Communalism and Ethnic and Political Movements

Regionalism (GIRL HEAP)

1. Regionalism in the context of Indian Society is simply the lack of a commonality of ideals and aspirations of shared emotional bonds and values. It is the anti-thesis of nationalism i.e. a feeling of nation against communalism, linguism, regionalism and other disintegrative forces. In this perspective, nationalism is not seen as a force for the good of all nor is there a positive valuation to the idea of nationalism.

2. Regionalism in India is rooted in the structure of its society and geography. The factors within the structure of Indian society and geography, which have aided the development of regionalism, can be analyzed at different levels. A brief analysis is attempted below.

Human Diversity: India is characterized by a plurality of people divided in terms of caste, religion, race and class. The plural society of India is organized into a hierarchical social order comprising of groups and individuals with unequal status with somewhat varied backgrounds. People are therefore grouped into primordial categories based on religion, language, caste etc. This kind of grouping helps the people within a group to exploit the group ties to get the largest share of whatever resources available that are available in the country. Besides, the material benefits accruing out of groupings into primordial categories, the individuals within a particular group derive some form of common identity and emotional security. Thus, there is supposed to be a feeling of oneness within the group, however narrowly it may be defined. In addition, even within the apparently large homogeneous groups, there is clear stratification. For e.g. the Hindus are a majority in India constituting around 82% of the population but the scheduled castes enumerated as Hindus, do not share the Hindu identity in the true sense of the term. National integration in India is generally seen in terms of the problems and aspirations of the minority groups but there is no agreed definition of the term minority. Even within the Hindu society, it is difficult to designate precisely a caste or community as a majority or a minority. The Parsis and Jains are very small minorities but they enjoy certain economic and social privileges, which even caste Hindus, the Scheduled Castes, the Scheduled Tribes, and Muslims do not. Minorities therefore, cannot be defined in terms of numbers since communities are differentiated socially, economically and politically. In fact, it is these differences, which are causes for the violence and conflict in the village community. Thus, even a particular religion cannot be a vehicle for fostering brotherhood among its believers. Hence, in a multi-religious, multi-caste and multi-lingual society like India, it is not possible to formulate common values for people of all religions, especially because of the fact that the majority community tends to overshadow other religions. Thus, multiplicity of religions and the hierarchy of organization on the basis of religion and caste is a material factor in the Indian society for the development of regionalism.

Language (2) Language, a product of religion and ethnicity is a major factor for the growth of the regional sentiment. In a multi-lingual society like India, linguistic diversity in terms of regional and national languages and dialects tends to divide the country into areas, sub-areas and sub-sub-areas. The peculiar problem of language in India is that even national languages are regional in scope. Language is a sensitive issue since it is a source of identity and a means of expressing one's ideas. Accepting Hindi as a national language is perceived as suppression of Dravidian and other languages or, is seen as the cultural hegemony of Hindi speakers of the North. The growth of regional sentiment based on language and culture is clearly seen in the formation of regional parties like the D.M.K., T.D.P., Shiv Sena, whose declared aim is to protect the regional culture and, who attempts to establish the supremacy of regional

(iv) Linguistic solidarity in Independent India has been responsible for several ethno-political movements

Regionalism also comes into being when non-tribals exploit the tribe.
 Ex: Ethnicity in scheduled areas of AP ; Gonds formed Gond sabha

Anthropology Paper 02 - Volume 03

1. cultures over national values. Formation of new states has even been demanded on the basis of such cultural and ethnic identities as for example, the demand for Bodoland in the Northeast.

2. **Economic Roots of Regionalism:** The growth and development of regional sentiment is clearly related to the scarce resources in context of growing numbers, a situation which makes people to resort to primordial group identities to corner more benefits. A major factor for the growth of the regional sentiment is the level of economic development achieved in different regions. The demand for Jharkhand is the manifestation of economic underdevelopment of the tribal tract of Santhal Paraganas and Chotanagpur region of Bihar. The tribals constitute only 30% of the population and the remaining 70% are non-tribals locally called Dikkus. This tribal region accounts for nearly 70% of the revenue of Bihar because of its mineral wealth. However, the tribal region is itself underdeveloped with poor power supply, poor infrastructure and inadequate education of the tribals. The region contributing nearly 70% to Bihar's treasury gets only 10% of funds for development and even this is misused. The funds for the tribal sub-plan are misused. Thus, the tribals feel that they are being exploited and are hence demanding a separate Jharkhand State carved out of the region. On the contrary, the separatist and even secessionist movement in Punjab is because of the overdevelopment of the region. The result is that the dominantly Sikh population of Punjab is reluctant to share the prosperity with other regions of the country. Thus, inadequate development and exploitation of tribals are at the root of development of regional sentiment as manifest in Gorkhaland, Bodoland, and the 'foreigners' problem in Assam.

Identity crisis

Social Roots: The growth of regional sentiment has to do with the so-called "identity-crisis", being faced by some communities. Identity crises is a feeling of alienness in a particular society. However, identity crisis is a inequity between people. Thus, a feeling of inferiority, smallness and repression creeps into some communities because of poor economic condition, backwardness of education and other spheres while at the same time, other communities may have a feeling of being dominant on several counts such as numerical strength, economic standing or political power. Thus, the feeling of alienness leads to the growth of a strong regional sentiment and can manifest in "sons of soil" movement in Telangana region of

Ex: (i) A.P., Assam, Bengal and Karnataka. A good example of conflict due to identity crisis is that of killing of (ii) Marwaris in Bolangir district of Orissa by 'champions of sons of soil.'

3. **Political and Administrative Factors:** The political and administrative trends have also contributed to the growth of division in the society. Political parties and politicians divide the society and mobilise the people by appealing to pre-modern units like caste and religion for narrow political purposes. For e.g. the B.J.P. is seeking to enlarge its space by embarking upon consolidation of Hindus. In India, the election results are determined to a lesser or greater extent by mobilising people on caste and communal lines.

Politics (i) Sectarian, religious, communal leaders influence the voting pattern. A good example in the recent past is the call given by Imam Bukhari, the religious head of Muslims in India to vote for the Janata Dal in the 1990 elections. There is a leadership crisis and clear or absence of enlightened leadership; leaders articulate economic and social problems as cultural and religious problems to consolidate their parties that further divide the country. Administrative problems like boundary disputes, riparian disputes, and language policies lend strength to regional forces.

*North East
backward* 6. **Geographic Roots:** In a small way, geographic features of India have fostered the growth of regional sentiment. The inaccessibility of the northeast, its hilly terrain has made economic development of the region a little difficult. Even though blessed with abundant waters of the Brahmaputra, the region cannot harness it for developmental activity because of geographic limitation; consequently, the economic development has been relatively slowed down. In addition, the shelter afforded by the region with its hilly terrain has led to the preservation of the regional ethnicity for a long period of time. As a result,

isolated from mainstream India the region has come to have its own regional personality and hence the development of a strong regional sentiment. Similarly, the underdevelopment of Kashmir is partly because of its geographic setting. Thus, a peculiar feature of Indian society is the territorial grouping of certain ethnic groups leading to regionalism.

Policy of
isolation,
divide
rule.

✓ **Historical Factors:** The colonial policy of dividing the people is yet another contributory factor for the continued division of Indian society. The British, in order to consolidate their imperial hold, were able to create cleavages between Hindus and Muslims by exaggerating the linguistic, regional, cultural and historical differences. The British sowed the seed of unequal development of the two communities leading to disintegration of the subcontinent. The division of the country in 1947 was not the end of the problem as the two communities have been at loggerheads from time to time even at the slightest provocation on either side. Ahmedabad, Bhiwandi, Ranchi, Aligarh, Meerut, Surat, Ahmedabad are a testimony to this continued acrimony. In addition to their policy of divide and rule, the colonial government followed the "policy of isolation". This policy involves the isolation of some parts of the sub-continent either to maintain the cultural identity of the area or for a special governance of the area because of the primitive level of the people's thinking. This policy eventually led to a feeling of being neglected and later on developed into numerous revitalization movements, especially in the tribal population, with sub-nationalistic overtones.

Communalism

Communalism or communal ideology consists of three basic elements or stages, one following the other. First, it is the belief that people who follow the same religion have common secular interests, i.e., common political, economic social and cultural interests. This is the bedrock of communal ideology.

The second element of communal ideology rests on the notion that in a multi-religious society like India, the secular interests, i.e., the social, cultural, economic and political interests of the followers of one religion are dissimilar and divergent from the interests of the followers of another religion.

The third stage of communalism is reached when interests of the followers of the different religions or different 'communities' are seen to be mutually incompatible, antagonistic and hostile. Thus, the communalists asserts that Hindus and Muslims or Hindus and Sikhs 'cannot' have common secular interests, and that their secular interests are bound to be opposed to each other. Communal violence is a conjunctural consequence of communal ideology. Similarly, Hindu, Muslim, Sikh or Christian communalisms are not very different from each other; they are varieties of the same communal ideology.

✓ Growth of communalism in India is a relatively recent development. Communalism emerged as a consequence of the emergence of modern politics, which marked a sharp break with the politics of medieval or pre-1857 period. Traditionally, Hindus, Muslims, and Sikhs constituted three important religious communities in India. All throughout the Indian history the average members of Hindu and Muslim or Hindu and Sikh community have lived as good neighbours and maintained cordial relations. Although, in case of Hindus and Muslims there did exist restrictions on commensality and inter-marriage. But such restrictions did not come in the way for co-operation for common economic, political or social objectives.

However, the situation started changing after 1857. The defeat of the Mutineers and the establishment of British rule throughout India after 1857 was a disastrous blow to the position of Muslims in the country. They fell from the privileged status of ruling class and rapidly sank into poverty and backwardness. The deliberate British policy of discriminating against the Muslims hastened their decline. On the other hand,

Ex:- Mezzafarangar violence (Sep-9-2013)
Kotadi (Rajasthan) - (Jan-2014)

the growth of education and the new opportunities in bureaucracy, trade and commerce benefited the Hindus who took the modern education and were preferred by the British in government employment while the Muslims were deliberately excluded. The exclusion of the Muslims was due to two reasons:

1. Muslims were rather slow to take modern education because of the strong hold of Islamic tradition.
2. There was a policy of systematic suppression of the Indian Muslims by the British because of the deep distrust which had grown against Muslims due their role in the 1857 uprising.

The inevitable result of this deprivation was that a deep sense of frustration and strong resentment against the British filled the minds of Indian Muslims. Further, the artisans and craftsmen in the urban areas, majority of whom happened to be Muslims, were ruined by the trade policies of the British.

However, towards the end of the 19th century, the policy of the British towards the Muslims changed. Fearing the rising tide of Indian nationalism, especially after the formation of Indian National Congress, the British adopted the policy of organizing Muslim communalism as a counter-weight to Indian nationalism. Thus, the further growth of Hindu and Muslim communalism was to a large extent the result of the deliberate policy of 'Divide and Rule' followed by the British. As Mahatma Gandhi declared at the Second Round Table Conference, the problem of communalism was 'co-equal with the British advent'.

Mr. Beck, the first principal of Sir Sayyid's 'MAO' college played an important role in creating a sense of distrust and fear of Hindu majority in the minds of Muslim leaders. He was also instrumental in the establishment of 'Mohammedan Anglo-Oriental Defence Association' in 1893 with himself as one of the Secretaries. The association aimed at protection and promotion of the political rights of the Muslim community. The partition of Bengal in 1905 was another step towards creating a divide among India on communal lines.

Later on, when Constitutional Reforms were introduced in 1909 the then Viceroy Lord Minto encouraged some of the Muslim leaders to demand separate electorates and in his correspondence with the Secretary of State, Lord Morley, the Viceroy repeatedly insisted that separate electorates would alone satisfy Muslim interests. Thus, the second stage of communalism, whereby different religious communities view their secular interest as mutually exclusive, was reached by the time separate electorates were awarded by the Morley-Minto Reforms. In the words of Ashok Mehta and Achyut Patwardhan, the communal and separatist tendencies were sedulously cultivated and adroitly exploited to insure the safety of the British Raj. Other factors, which contributed to the rise of separatism, include absence of an educated middle class among the Muslims with modern secular outlook.

Further, the attitude and policies of some of the Indian nationalist leaders also contributed to the rising tide of communalism. The extremist leaders like Tilak, Bipin Chandra Pal, Aurobindo Ghosh and Lajpat Rai - were not only great patriots, they were also staunch Hindus and in order to mobilise the Indian masses to fight against the British they often appealed to the Hindus religious symbols, e.g., revival of Ganesh worship by Tilak, and reinterpretation of the Indian history in a religiously biased manner as can be seen in the glorification of Shivaji vis-a-vis Aurangzeb. The 'Shudhi' movement launched by Arya Samaj with which Lala Lajpat Rai was closely associated, also antagonised the Muslims. Thus, inadvertently some of the nationalist leaders contributed to the widening communal divide. Further, the spread of education to well-off peasants and small landlords extended the boundaries of job seeking middle class to rural areas. The newly educated rural youth could not be sustained by land as agriculture was totally stagnant because of the colonial impact. They flocked to the towns and cities for openings in government jobs through the system of communal reservations and nominations. Thus, communalism was also an

6 ✓ expression of the interest and aspirations of the middle class in a social situation in which opportunities for them were grossly inadequate. The main appeal of the communalism and its main social base also lay among the middle classes. It is however, important to note that quite a large number of middle class individuals remained on the whole, free of communalism even as late as 1930s. This is true of all, whether Hindu, Muslim or Sikh.

Some other factors also contributed to the growth of communalism, e.g., in Bengal, due to historical reasons, it happened that the peasantry was predominantly Muslim while the landlords were mainly Hindus. Due to the cultural backwardness of the peasantry it was not difficult for the communalists to misrepresent any real economic conflict between Muslim tenants and Hindu landlords as a communal conflict and subsequently even convert it into a communal conflict. Similarly, conflict between money-lenders who were often Hindus and Muslim debtors were sometimes mis-represented as oppression of the Muslims by the Hindus and give a communal turn by the communalists. Although, Gandhi made an attempt to unite the two communities by adopting the cause of the 'Khilafat' movement but later, abrupt withdrawal of non-cooperation movement by him after the violence of 'Chauri-Chaura' disenchanted the Muslims. Thus, clashes took place in various parts of the country after the withdrawal of non-cooperation movement.

7 During this period, number of communal organisations had come into existence among Hindus and Muslims like for e.g., the first session of All India Hindu Mahasabha was held in 1915 while All India Muslim League had already been founded in 1907 under the leadership of Zamindars, ex-bureaucrats, and upper class Muslims like Agha Khan, the Nawab of Dhaka and Nawab Mohsin-ul-Mulk. The Hindu as well as Muslim communalists tried to create the psychological fear among Hindus and Muslims - the fear of being deprived, surpassed, threatened, and even exterminated. Thus, Hindu Mahasabha talked of its objectives as 'maintenance, protection and promotion of Hindu race, Hindu culture and Hindu civilisation for the advancement of 'Hindu Rashtra', and Arya Samaj launched the 'Sanghathan' and 'Shudhi' movement among the Hindus. This was retaliated by 'Tazzeem' and 'Tabligh' movement among the Muslims.

8 Communalism remained restrained and moderate phenomena till 1937 when it increasingly started assuming a virulent and extremist form. The election of 1937 showed that majority of both Hindu and Muslim masses were non-communal and did not extend their support to either Hindu Mahasabha or the Muslim League. Failure to secure mass support by the communalists drove them to extremist positions. This was partly to prompt the Congress programme of a massive campaign among the Muslim masses, known as Muslim Mass Contact Programme. Thus, Jinnah openly advocated the need for creation of Pakistan 'to save Islam from complete annihilation in this country'. The Muslim communalists launched a vicious campaign against the nationalist Muslims and the Congress. Moulana Abul Kalam Azad and other Nationalist Muslims were branded as show-boys of Congress and Traitors to Islam and Khan Abdul Gaffar Khan was held responsible by Jinnah for emasculation of the martial Pathans.

9 On the Hindu side, V.D.Savarkar and M.S.Golwarkar fanned the communal fire. The bitter harvest of this campaign of fear and hatred carried on by both the Hindu and Muslim communalists was reaped by the people in Calcutta, killings of August 1946, in which over 5,000 people lost their lives within 5 days, in the butchery of Hindus in Noakhali in Bengal and of Muslims in Bihar, the carnage of partition riots and the assassination of Gandhiji by a communal fanatic.

10 Even after independence, the virus of communalism did not die and the post-independence developments of last 45 years have shown that the problem of communalism continues to remain in India and is growing day by day. In fact, the instances of communal riots in Meerut, Delhi, Moradabad, Aligarh,

Ex: recent Kashmir, Bihar killings
347

Ahmedabad, Bombay, Hyderabad and numerous other places are far too many to be counted and described. The new face of communalism is showing itself in the growth of separatist movement among the Sikhs leading to continuing terrorist violence over last 10 years in Punjab and along with religious communalism, caste based communalism is also becoming a recurrent feature of Indian society. Recent riots in Vijayawada, Tamil Nadu etc., are a pointer to this new trend.

- 12 The reason for continuation of communalism after independence and its new manifestations can be traced to the nature of Indian policy, economy and society. Functioning of a modern democratic political system in a traditional society divided among caste and religious communities has contributed to the growth of communal politics. The pre-condition for the smooth functioning of liberal democratic system is secularization of social life and liberation of individuals from the hold of corporate groups like caste, family, state or religion as is manifested in the ideology of individualism. In India, the democratic political system was adopted because of the preferences of the westernized political elite represented by Nehru, without a corresponding modernization of social life as manifested in the principles of individualism and secularism and the growth of political parties based on secular ideology and participatory civic culture. The competitive electoral politics forms the legitimate means for access to political power in a democratic system. However, in the absence of effective party machinery for the political mobilization of the masses, the political leadership has often appealed to the caste and religious sentiments of the people to gain electoral support. Thus, religion and caste have become new means for political mobilization and has acquired a new lease of life. As can be seen from the politicization of Shri Ram Janma Bhumi Vs. Babri Masjid issue or the policy of reservation for Backward Classes. Moreover, rapid and uneven economic development and disproportionate growth of cities has led to the growth of religious fundamentalism among all religious communities. The uneven development of cities had led to growth of mass poverty on one hand and unprecedented affluence among a small section of the elite. Often, the economic grievances of the poorer sections of the majority communities are given a communal interpretation by political leadership to further their own political interests. Thus, compulsions of electoral politics in an unevenly grown economy and traditional society have contributed to the continuation of communalism among various religious and caste communities.

Communalism Vs Secularism: Secularism implies two things - A secular state and a secular society. A secular state, according to Donald Smith is one "which guarantees the individual corporate freedom of religion, deals with the individual as a citizen irrespective of his religion, is not constitutionally connected to a particular religion, nor does it seek to promote or interfere with the religion".

On the other hand, a secular society is the one which has undergone a process of religious secularisation whereby religious thinking, practices and institutions lose social significance. Thus secularism involves a thorough going psychological transformation and a change of attitudes accompanied with change in the nature of belief systems and institutions.

Emergence of secular society in the west has been a consequence of the growth of modern industrial mode of production and advancement of scientific knowledge. While growth of scientific knowledge leads to a decline of cognitive functions of religion and the scientific world, rise of modern industrial societies have been accompanied with a process of structural differentiation whereby various parts of the society and their functions become increasingly specialised being based on esoteric knowledge. As a result of this, religious ideas and norms can no longer serve as the fountain of all embracing knowledge to govern the functioning of these parts nor can the religious norms serve as a means of social control. Thus religion loses its hold over various fields of social activities such as politics, economy, education,

medicine and law etc. The civil authority based on secular and scientific knowledge comes to replace religion, as an agency for social regulation and control.

However, this trend towards decline of the hold of religion on social affairs does not imply disappearance of religion. Religion survives and even grows, but, its role and the nature of religious organization undergoes change. As Peter Berger says, the extreme complexity of the social structure of the industrial society renders the religious beliefs implausible so far as social relations between individuals and groups are concerned. But, given the problem of anomie and alienation in modern society and inability of science to answer the fundamental questions of human existence, the need for religion continues to be felt.

✓ Religion continues to be the means to answer the imponderables of human existence and thus satisfies the personal needs of the individual. This process of religious transformation has been termed as privatization of religion whereby religion becomes a purely private or personal affair. While in the social realm, religion ceases to be the main source from which social values, goals and norms of social action emanate. By adopting rational and scientific procedures, a secular society chalks out alternative paths of social action.

✓ The situation in third world societies is however different. In the course of modernization they are being transformed from 'sacred society' to 'secular society'. However, in most third world societies the process of the modernization has taken place in an uneven manner leading to a state of anomie due to polynormativism. These societies represent a social situation characteristic of what Fred Riggs has termed as 'prismatic societies'. Uneven growth of modern industries and scientific, secular education has led to the continuation of religious belief and practices and the hold of religion on social life continues to be strong especially in the rural areas and among the migrant population in the urban areas. On the other hand, the political elite have sought to establish secularization largely through legislative fiat without a corresponding change in the social life. Given the state of anomie as manifested in the coexistence of economic prosperity and backwardness, widening economic inequalities, increasing political corruption, and rise in the crime rate, especially in the urban areas due to over urbanization etc., has led to the rise of religious fundamentalism.

Further, increasing recourse to religion for political mobilization has also strengthened religious institutions and fundamentalist beliefs. Thus, while the institutional norms governing the state and society preach secularism, the existential reality is characterized by the growth of religious fundamentalism and inter-religious conflict. A similar situation is to be found in Indian society too.

✓ **Secularism in India:** Historically, India has been a land of plurality of powerful religious sects. So religious tolerance has been one of the traditional social values in India, since without it, the existence of an ordered society would have been impossible. The secular tradition as manifested in the religious tolerance can be traced back to the time of Ashoka. Even the Muslim rulers did not intervene in the religious life of people except for the occasional imposition of Jaziya by Mughal emperors like Aurangzeb.

✓ Even the East India Company pursued the same policy of religious tolerance and non-interference in religious conflicts, although, some Christian missionaries did start proselytizing activities. However, later on, the British administrators did initiate measures of socio-religious reforms like abolition of sati, introduction of secular education through English medium, legislations regarding widow re-marriage and inter-caste marriage etc. Number of Indians influenced by western education also propagated these socio-religious reforms.

✓ The new political elite, which emerged as a result of western education, acquired a secular outlook. However, some of the important leaders of Indian National Congress like Bal Gangadhar Tilak, Bipin

Chahdra Pal and Aurobindo Ghosh and later on, Lala Lajpat Rai and Madan Mohan Malaviya remained staunch Hindu and often used Hindu religious symbols, (like popularization of Ganesh worship by Tilak), for the purpose of political mobilization. Similarly, certain activities of revivalist Hindu sects like the Suddhi movement by Arya Samaj etc., contributed to mutual fear and suspicion among Hindus and Muslims which was further accentuated by the British policy of 'Divide and Rule' where by Muslim communalist leaders belonging to Muslim League, were encouraged to demand the separate electorate. Thus the introduction of electoral politics in India led to the strengthening of the religious identities and decline of religious tolerance, which finally culminated into partition of the country, accompanied with the communal carnage.

- Q In post independent India the new state was created on secular principles. Thus the Constitution guarantees individual and corporate freedom of religion (articles 25, 26 and 30). It deals with the individual as a citizen irrespective of his religion (articles 14, 15 and 16). Further, it is not constitutionally connected with any particular religion nor does it seek to promote or interfere with any particular religion. (Although, abolition of untouchability under article 17, prohibition of cow slaughter under article 48 and rules passed by the state governments banning the slaughter of animal and the sale of meat on certain days looked upon as sacred by Hindus, and prohibiting the playing of the band while a procession passes by a mosque are not really secular). Similarly, state sponsored celebration of religious occasions like centenary celebrations of various religious saints and broadcasting devotional songs of Hinduism and other religion by AIR and transmission of epics like Ramayana and Mahabharata through Television are not strictly secular activities according to the definition given by Donald Smith. Moreover, legislations like Hindu Marriage Act and Civil Rights Act etc., have also been attacked by some as state interference in religion. However, Justice Gajendra Gadkar has justified these legal enactments on the basis that in a secular society personal law has to be based on rational and secular considerations. Thus it is argued that even minorities like Muslims should also recognize the importance of having uniform civil code for the whole country. On the whole, it can be said that the Indian state is based on secular principles and its policies are guided by liberal, egalitarian and humanitarian principles as can be seen from the Fundamental Rights and the Directive Principles of the state policy. Further, the citizens enjoy complete freedom of religion.
- Q(b) However, at the societal level, secularization of social life leading to decline in the hold of religion in social affairs, growth of rational, scientific outlook and development of 'this worldly outlook' to replace the religious 'other worldliness' and the decline of the notions of the purity and pollution etc., have not become a characteristic of the society as a whole. Growth of these modern secular attitudes is confined largely to the urban areas and only among the Western educated middle classes. Otherwise, Indian society remains deeply steeped in religion.

- Q Given the compulsions of competitive electoral politics in an immature democracy, lacking a stable party system, religion has come to be frequently used as a means for political mobilization, thus strengthening the religious identities and outlooks.

- Q Anomie situation obtaining due to uneven development and perpetuation of inequalities have also strengthened the fundamentalist forces. Thus with the process of modernization the traditional institutions like religion are being increasingly strengthened and secularism in social life is increasingly becoming a distant goal. Just as modern political system strives to modernize the traditional society, so also the traditional social system tries to traditionalize the modern political system. Thus religion is increasingly becoming inseparable from politics whereby political leaders, including those occupying constitutional offices, freely lend support to growth of religious consciousness leading to communal

divide and communal conflict. The communal riots in Meerut, Muradabad, Aligarh, Hyderabad, Bombay, Delhi and continuing religious terrorism in Punjab over last 10 years are the manifestations of the growth of religious consciousness and decline of secularism in society. The recent politicization of "Babri Masjid Vs. Rama Janma Bhoomi" issue and spread of religious terrorism to Jammu and Kashmir are further indicators of growing communalism as a result of religion based politics and they are the pointers to a gloomy future for the growth of secularism in Indian society. Thus, Indian secularism has come to mean the freedom of religion in society, but, not freeing of society from religion.

Ethnic and Political Movements

✓ Ethnicity refers to the interrelationships between ethnic groups. Ethnic group is a cultural group whose members either share some or all of the following features - a common language, region, religion, race, customs and beliefs. Ethnicity also refers to the interaction between culture groups operating within common social contexts.

✓ Ethnic identity reflects both "likeness" and "Uniqueness". On the one hand, it reflects on what the members of an ethnic group hold in common, at the same time differentiation them from other ethnic group.

Clifford Geertz, an American Anthropologist has stated that there is a need to build a nation where essence of unity overrides all the loyalties. If there is problem even in the sub division of a country, there would be civil discontent which will lead to revolution and the downfall of the Governments themselves. This discontent, according to Geertz, comes from the "Primordial Sentiments" of the people. The people employ these ethnic sentiments to raise a political movement, which shows the discontent among them. Primordial sentiments are all those which come to an individual through birth. These are the phenomena like caste, language, religion, etc.

✓ Primordial discontent is caused by ethnic conflicts like regional conflict, language conflict etc. The actual foci around which these discontents tend to get crystallized are many. Most important of them are discussed here.

1. **Assumed Blood Ties:** Here the defining element is "quasi" kinship, because the kin relations are formed around unknown biological relationship. These units are most tradition bound and regard them as having more than limited significance, and the referent is, consequently to a notion of untraceable but yet sociologically real kinship as in a tribe. Nigeria, the Congo, and the greater part of sub-Saharan Africa are characterized by this kind of primordialism. So also the nomads of Middle East, the Kurds, Baluchis, the Pathans and so on. The Nagas, the Mundas, and Santhals of India and most of the Hill tribes of South East Asia, also reveal this sentiment.
2. **Race:** Race is similar to assumed kinship, in that it involves the ethno-biological theory. But it is not quite the same thing. Here, the reference is to the phenotypical physical features especially the skin colour, facial form, stature and so on, rather than any very definite sense of common descent as such.
3. **Language:** Linguistic solidarity in Independent India has been responsible for several ethno-political movements. Linguisim is particularly intense in the Indian Sub-continent and also Malaya, Indonesian Islands etc. As already mentioned, the separation of the states into linguistic regions is a case of a hence cultural frontier being translated as a political frontier.
4. **Region:** Regionalism naturally tends to be especially trouble some in geographically heterogeneous areas. For example, Vietnam, East and West Pakistan, Indonesia etc. The tension involves differences in languages and culture, but the geographic element is of great prominence owing to territorial discontinuity of the country.
5. **Religion:** Indian partition is the outstanding case of the operation of this kind. Burma, Indonesia, Philippines, Pakistan are the other countries which suffer from the religion oriented conflicts.

defined as a revolt by an ethnic group which feels politically discriminated and is mobilised by appealing to caste, language, religion, region etc.

Anthropology Paper 02 - Volume 03

6. Custom: Differences in custom form a basis for a certain amount of national disunity almost everywhere and are of a special significance in those cases where an intellectually and artificially rather sophisticated group sees itself as the bearer of a civilization amid a largely barbarian population that could be well advised to model itself upon.

Primordial sentiments come to an individual by birth. Once an individual is born all the sentiments are attributed to him through socialization. People coming from the same language, religion and region are not bound by any personal affection or by common interests, but by some absolute and unaccountable inputs which tie them together. The corporate sentiment results when a particular group feels politically discriminated and this political suffocation will result in a revolt under the banner of caste and they fight for a separate nation or a state. This is what is referred to as a Ethno-Political Movement. (g) religion, region, language

EPMs in India

Certain general features can be observed from the study of Ethno-political movements in India. The Ethno-political movements are a consequence of organized bodies. For the conflict to become a public issue, usually the organized bodies, which are backed by political parties, have to come to the fore. Thus communal bodies become institutionalized.

3 ✓ Ethnic movements indicate that whatever be the manifest cause - language, region or religion - the latent cause is not rooted in cultural disparity. Conflicting economic and political interests form the basis of the latent cause. The tensions generally arise when a minority group feels deprived of an equal position in either the economic or political sphere as compared to the majority group uses the primary ties to motivate and activate their ethnic group against the dominant group. For instance, the Hindu-Sikh conflict is between peoples who are not culturally different, but rather are well-assimilated groups. Thus, we may say, that ethnic conflicts or movements arise not because of common goals but because of conflicting interests.

The allegiance or the basis of group loyalty depends on the principle of mutual interest. For instance, during the 1972 Assam riots, the Bengali Muslims, who share cultural similarities with Bengali Hindus did not side with them, instead they supported the Assamese exchange of not being ousted from their land, by the politically active Assamese.

A coherent and effective response to ethnic conflicts has to keep in mind, the common as well as the unique factors, which account for clashes between groups of people. Some insist that so long as economic inequalities exist, such clashes are bound to persist. Since it is not easy to end economic disparities between people, ethnic conflicts will also not be easy to stop.

More about ethnic and political movement can be found in the relevant chapter elsewhere in this volume.

National Integration

National integration is a state of accommodation among different groups: ethnic, caste, linguistic and regional. It is a state in which group identity is in harmony with national identity. Pluralism with cohesiveness is an indicator of national integration. In the early stage of post-independent history, political consolidation was considered an effective step towards national integration. The government initiated various measures like reform and welfare legislation, abolition of untouchability and land reforms, abolition of privy purses and bank nationalisation to subserve the interests of all, territorial reorganisation of states in 1956, protective and positive discrimination to minorities etc.

✓ Thus, national integration was understood not simply in terms of avoidance or resolution of conflict but as a process of development and egalitarianism. Both political and socio-economic measures were taken to neutralise cleavages of various sorts between different sections.

✓ The constitutional provisions providing various safeguards for different ethnic and regional groups, protection of cultural, religious and customary practices by constitution, the provisions for amity and harmony, establishment of Planning Commission to secure balanced regional development, National

Development Council and even the National Integration Council are efforts made to achieve national unity and harmony.

The other measures taken are the three language formula, setting up of the inter-state council, special administrative procedures for tribal and scheduled areas like the north-east, a centralised media network, uniform system of secular education, development of integrative defence forces as against British policy to have Gurkha, Sikh regiments, N.S.S. and N.C.C. and decentralisation of power. Thus, the strategy is economic development and distributive justice, besides secularisation of the society.

Suggestions: Though there are centrifugal forces that tend to promote regionalism, the centripetal forces, which stress the unity of the country, like our cultural heritage and broad cultural unity should be emphasised. The concept of nationhood, the elements of culture that are our common heritage should be constantly defined and identified. The elements, which weave these concepts into a multi-cultural, multi-religious and multi-ethnic society, are: secular education; inculcation of reverence towards nation's geography and history and the national flag. The mass media and political leaders/parties should reinforce these values.

1. We have to assume protection to various minorities and their cultural identities apart from various minority religious faiths. The crux of the problem of minorities is to identify minorities not only in terms of numbers and ethnic background, but also in terms of the socio-economic position of the people and their political and social aspirations. This should be followed by application of the principle of distributive justice to reduce the inequalities and discriminations and to bring about egalitarianism.
2. A little more emotion should be put in the study of history and geography in our schools so that every Indian can be made proud of his identity and Indian history. Nothing should come in the way of imbibing the constitution right from schools.
3. Certain uniformity in the system of education with a curriculum on India's past written with greater imagination can do wonders.
4. Public sector units and big industrial houses (private) should follow a policy of all India selection.
5. Expansion of employment opportunities across states with very little emphasis on "sons of soil" thesis. Reservation policy should not be carried beyond absurdity.
6. Composite police forces in communally disturbed areas to install a sense of confidence among minorities.
7. Code of conduct for political parties ensuring that they do not aggravate existing differences or create hatred between castes and communities.
8. The problems of ethnic groups/minorities should be tackled on a priority basis.

Thus "National Integration" is a composite concept having several dimensions: social, cultural, economic, political and religious. It also depends upon the contextual position of a particular group in the national or regional setting. India has a long history of continuity of specific traditions, religious and cultural attitudes, values and ideas. In spite of the differences among people, a certain level of unity, harmony and cohesion among different sections of the society can be achieved by ensuring certain minimum institutional mechanisms and infrastructural facilities for the less advantaged and the weaker sections.

- ① Biological & cultural factors in Human Evolution
- ② Critique of synthetic theory
- ③ " " Great & Little tradition
- ④ Cultural materialism - Marvin Harris
- ⑤ Tribal Markets
- ⑥ Kinship Behaviour

Non-Timber FP is any useful substance, material (or) commodity obtained from a forest which doesn't require harvesting trees. It includes game animals, fur-bearers, nuts, seeds, berries, mushrooms, oils, foliage, medicinal plants, peat, fuelwood, forage etc.

nailedupsc.com

PR Govt. Davis their impact on rural life.

C Say

15

Panchayati Raj in Tribal Sub-Plan Areas

(The Constitution of India provides to all the citizens, social economic and political justice and equality of status and opportunity.) Article 46, under the Directive Principles of State Policy, provides that "the State shall promote with special care the educational and economic interests of the weaker sections of the people and, in particular, of the Scheduled Castes and Scheduled Tribes and shall protect them from social injustice and all forms of exploitation."¹

The interface between development and self-governance through the panchayats has acquired a new dimension in recent years in the context of tribal India, particularly with the ever-increasing problems of land alienation, deforestation and displacement. The long-term objective of the Tribal Sub-Plan (TSP) approach has been to narrow the gap between the levels of development of tribal and other areas while improving the quality of life of the tribal communities. This is possible not only by making the tribals the beneficiaries or involving them in programmes of development, but by making them a part of the decision-making process. A shift in the approach from paternalistic to welfare, to the development and now to empowerment has become visible. It is here that the role of the panchayats as a unit of governance based on tribal customs

Shift in
approach

Paternalistic - Welfare - Devt - Empowerment

becomes important because the panchayats are not only the decision-making and implementing agencies, but also those which work for the overall development of its people and at the same time preserve their culture.

The Constitution (73rd Amendment) Act, 1993 was to ensure more decentralization of power and people's participation in the development processes. The Act was extended to the scheduled areas also in some states like Rajasthan, Gujarat and Madhya Pradesh. Elections were held, though the Act had a provision in Article 243(M) that nothing in the Act will be applied to the scheduled areas unless modified and amended by an Act of the Parliament (143M 4b).

The extension of the Constitution (73rd Amendment) Act, 1993 and the election processes were challenged in the High Courts of some states like Andhra Pradesh, Orissa, Bihar and Maharashtra. As a consequence of this, the Government of India set up a committee, popularly known as the Bhuria Committee.² It was set up in 1994 and made far-reaching recommendations on the law concerning TSP areas. It stressed on village governance, participatory democracy, community control over resources and suitable administrative framework for scheduled areas. The committee wanted traditional institutions as the foundation on which modern super-structure should be built because the various tribes living in scheduled areas had their own distinctive culture and special problems, but the issue of having separate Panchayati Raj system came up for the first time.

The Indian Parliament, keeping in view Article 243(M), has passed the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996³. The Act has extended the provisions of the Constitution (73rd Amendment) Act, 1993 to the scheduled areas, subject to exceptions and modifications as provided in Section 4. As per Section 5, the provisions of the State Acts had to be brought in line with Section 4 of the Act

within one year, but there was a proviso that the existing panchayats could continue till the expiry of their term. It became necessary for the states of Andhra Pradesh, Bihar, Gujarat, Himachal Pradesh, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, etc., to pass separate Acts for tribal areas in pursuance of the Extension Act, 1996, by the year 1997.

The Act of 1996 has also extended the provisions of part IX of the Constitution relating to the panchayats to the scheduled (tribal) area subject to such exceptions and modifications as provided in Section 4. It was provided that

- (a) the state legislation shall be in consonance with the customary law, social and religious practices and traditional management practices of community resources;
- (b) a village shall ordinarily manage its affairs in accordance with the traditions and customs;
- (c) every village shall have a Gram Sabha of the electors at the village level;
- (d) every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources and the customary mode of dispute resolution;
- (e) every Gram Sabha shall
 - (i) approve the plans, programmes and projects for social and economic development, and
 - (ii) identify beneficiaries under the poverty alleviation and other programmes;
- (f) every panchayat shall obtain from the Gram Sabha a certification of utilization of funds by that panchayat for the plans, programmes and projects referred to in clause (e);
- (g) the reservation of seats in such panchayats shall be in proportion to the population of the communities, provided that reservation for Scheduled Tribes shall not be less than one-half of the total number of seats and all the seats of the

- chairpersons of the Panchayat Samitis and the Zila Parishads shall be reserved for the Scheduled Tribes;
- (h) The State Government may nominate in the Panchayat Samiti and the Zila Parishad persons belonging to Scheduled Tribes that have no representation, but such nomination shall not exceed one-tenth of the total numbers;
- (i) the Gram Sabha or the panchayat shall be consulted before making the acquisition of the land in the tribal areas for development projects;
- (j) planning and management of minor water bodies shall be entrusted to the panchayats;
- (k) the recommendation of the Gram Sabha or the panchayats shall be made mandatory prior to the grant of prospecting license or mining lease for minor minerals in the tribal areas;
- (l) the prior recommendation of the Gram Sabhas or the panchayats shall be made mandatory for the grant of concessions for the exploitation of minor minerals by auction;
- (m) the State Legislature shall ensure that the panchayats and the Gram Sabhas are endowed specifically with
- (i) the power to enforce prohibition or to regulate or to restrict the sale and consumption of any intoxicant,
 - (ii) the ownership of minor forest produce,
 - (iii) the power to prevent alienation of land in tribal areas and take appropriate action to restore any unlawfully alienated land of the scheduled tribes,
 - (iv) the power to manage village markets,
 - (v) the power to exercise control over money lending,
 - (vi) the power to exercise control over institutions and functionaries in all social sectors, and
 - (vii) the power to control over the local plans and resources for such plans including the tribal sub-plan;
- (n) the State Legislature may endow the panchayats with powers and authority, as may be necessary to enable them

to function as institutions of self-government and shall contain safeguards to ensure that the Panchayat Samiti, or the Zila Parishads do not assume the powers and authority of the Village Panchayat or the Gram Sabha; and

- (o) The State Legislature shall endeavor to follow the pattern of the Sixth Schedule of the Constitution while designing administrative arrangements in the Zila Parishads of the tribal areas.

Necessary amendments as per Section 4 of the Act were to be made latest by 24th December, 1997, expiration of one year from 24th December, 1996, the date of assent of the Act by the President.

Common Panchayati Raj System

As regards Panchayati Raj in Rajasthan, Gujarat, Madhya Pradesh or other states, there were no separate provisions for the tribal areas included in the Fifth Schedule. There was a common Panchayati Raj system throughout the state, right from its inception in 1959. The various tribes, particularly the Bhils, Garasias, etc., living in the scheduled areas might be having their distinctive culture and tradition, but the demand for special type of Panchayati Raj in the TSP areas never materialized. Whatever customs and traditions of tribals existed, there was no clash with the legal or administrative Panchayati Raj system. On the contrary, there was continued effort on the part of the state to bring the tribals in the main stream of the society.

The state governments made special efforts for the development of the tribal areas and the welfare of the tribals by establishing the separate office of TAD Commissioners in the states. Special central assistance was provided for the development and welfare of the tribals. State plans had a separate component of the TSP. The Tribal Area Development Cooperative Corporation (TADCC) was also formed for the economic upliftment of the tribals. Special attention was paid to

promotion of education through establishment of ashram schools, scholarship to meritorious students, special incentives to girl students, etc. Forest development, fisheries development and lift irrigation projects were specially attended to. Drinking water, public health, specially control of TB and venereal diseases, ayurved camps and cattle health camps got special focus. Even pockets of tribal areas having more than 50 per cent tribal population got special funds for accelerated development through Modified Area Development Approach (MADA). But, the concept of a separate system of Panchayati Raj never came up in the TSP areas until the Constitution (73rd Amendment) Act, 1993.

Madhya Pradesh enacted a special amendment on 5th December, 1997, by adding a new chapter 14(A) in its Panchayat Raj Act, 1993, for the tribal areas. The Gram Sabha was made more powerful. Necessary amendments were also brought in the following laws:

1. M.P Excise Act, 1995: Sections 61-C, 61-D and 61-E were added, exempting the tribals from manufacture, possession and consumption of country liquor, allowing manufacture for domestic consumption and social or religious festival, prohibiting its sale, raising the limit of possession to 45 litres per family, subject to the overall control of the Gram Sabha.
2. M.P Minor Mineral Rules, 1996: Approval for the grant of mining lease or license will be taken from the following PRIs:
 - (a) Gram Panchayat—annual value up to Rs. 2.50 lakh.
 - (b) Janpad Panchayat—annual value more than Rs. 2.50 lakh but not exceeding Rs. 5 lakh.
 - (c) Zila Parishad—annual value more than Rs. 5 lakh but not exceeding Rs. 10 lakh.

The Village Panchayats shall take prior approval of the Gram Sabha also.

3. M.P. Land Revenue Act, 1959: Sections 170(A) and 170(B) provide for restoration of wrongfully alienated lands of the tribals to them or their successors, in case of death of the original owner. In case the Gram Sabha fails in such restoration, it will be referred to the concerned Sub-Divisional Officer who will do the same within three months. Section 170(D) prohibits a second appeal in such cases.
4. M.P. Village Courts Act, 1996: Special courts for the tribal areas have been constituted for every 10 or more panchayats. Every village court will have seven members who will be nominated by the Janpad Panchayat unanimously. These members will be other than Sarpanch, Up-Sarpanch, member of Block/District Panchayat, MLA, Chairman or Vice Chairman of the Krishi Upaj Mandi Samiti or Cooperative Society. These village courts have been invested with powers to impose fines up to Rs. 500 in revenue cases and Rs. 1,000 in criminal cases. They have no powers of imprisonment.

These courts have been invested with powers under the following Acts:

- (a) Indian Penal Code: Sections 160, 269, 277, 279, 323, 352, 379, 426, 442, 448, 506, 510, etc.
- (b) M.P. Smoking Act, 1929: Sections 4 and 5 regarding imposing a fine for sale of tobacco and smoking by adolescent in public places.
- (c) M.P. Public Gambling Act, 1967: Sections 3, 4, 6, 7, 8, 9, 13, 15 and 16 regarding imposing a fine for running a public gambling house or playing in such places.
- (d) M.P. Cattle Trespass Act, 1871: Sections 24 and 26 regarding imposing a fine for preventing seizure of trespassing cattle and loss of land or crops or public lands by pigs.

Gujarat as well as Himachal Pradesh Scheduled Areas Act was also enacted in 1997.

In Rajasthan, the Governor promulgated the Rajasthan Panchayati Raj Modification of the Provisions in Their

Application to the Scheduled Areas) Ordinance on 25th June, 1999, which became an Act after its approval in the Legislative Assembly on 30th September, 1999. Section 3 mentions exceptions and modifications for the scheduled areas of Rajasthan as under:

- (a) every village shall have a Gram Sabha consisting of persons whose names are included in the electoral rolls for the panchayat at the village level;
- (b) every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources and the customary mode of dispute resolution;
- (c) every Gram Sabha shall
 - (i) approve the plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the panchayat, and
 - (ii) be responsible for identification or selection of persons as beneficiaries under the poverty alleviation and other programmes;
- (d) every panchayat shall be required to obtain from the Gram Sabha a certification of utilization of funds by that Panchayat for the plans, programmes and projects referred to in clause(c);
- (e) the reservation of seats in the scheduled areas at every PRI shall be in proportion to the population of the community in that PRI for whom reservation is sought to be given under Sections 15 and 16 of the Rajasthan Panchayati Raj Act, 1994 (Act 18 of 1994);
provided that the reservation for the Scheduled Tribes shall not be less than one-half of the total number of seats;
provided further that all the seats of the chairpersons of the PRIs at all levels shall be reserved for persons belonging to the Scheduled Tribes;

- (f) the State Government may nominate persons belonging to those Scheduled Tribes that have no representation in a Panchayat Samiti or a Zila Parishad; provided that such nomination shall not exceed one-tenth of the total members to be elected in that PRI;
- (g) the Gram Sabha or the PRI at such a level as may be prescribed by the state government shall be consulted before making the acquisition of land in the scheduled areas for development projects and before resetting or rehabilitating persons affected by such projects in the scheduled areas, the actual planning and implementation of the projects in the scheduled areas shall be coordinated at the state level;
- (h) planning and management of minor water bodies, as may be specified by the government, in the scheduled areas shall be entrusted to the PRI at such level as may be prescribed;
- (i) no prospecting license or mining lease for minor minerals in the Scheduled Areas shall be granted to any person or body of persons without obtaining prior recommendation of the Gram Sabha or the PRI at such level and in such manner as may be prescribed;
- (j) no concession for the exploitation of minor minerals by auction in the scheduled areas shall be granted without obtaining the recommendation of the Gram Sabha or the PRI at such level and in such manner as may be prescribed; and
- (k) the PRI at the appropriate level, or the Gram Sabha, as may be prescribed, in a scheduled area, shall have
 - (i) the power to enforce prohibition or to regulate or restrict the sale and consumption of any intoxicant subject to such rules as may be made by the state government in this regard,
 - (ii) the ownership of minor forest produce, subject to such rules as may be prescribed by the state government to control and manage minor forest produce,

- (iii) the power to prevent alienation of land in the scheduled areas and to take appropriate action in accordance with laws in force in the state, to restore any unlawfully alienated land of a Scheduled Tribe,
- (iv) the power to manage village market by whatever name they are called, subject to such rules as may be made by the state government in this regard,
- (v) the power to exercise control over moneylending to the members of the Scheduled Tribes,
- (vi) the power to exercise control over institutions and functionaries in all social sectors to the extent, and in the manner, to be specified by the state government from time to time, and
- (vii) the power to control local plans and resources of such plans including the Tribal Sub-plan to the extent and in the manner to be specified by the state government from time to time.

Section 4 of the ordinance empowers the state governments to make rules in this regard and notify in the official gazette.

The Rajasthan government has yet to take the following steps:

- (1) define village as per section 2(a) of the ordinance;
- (2) prescribe the competent authority under section 3(g) for consultation prior to acquisition of land;
- (3) specify the PRIs for planning and managing water bodies as per section 3(h);
- (4) prescribe the manner and the PRI for recommending the grant of mining lease or license as per section 3(i) and 3(j);
- (5) make rules regarding section 3(k)(I) for sale and consumption of intoxicants;
- (6) make rules regarding ownership of minor forest produce and control and management thereof as per section 3(k)(II);
- (7) rules to manage village markets as per section 3(k)(IV);
- (8) manner of control over moneylenders as per section 3(k)(V);

- (9) manner of control over institutions and functionaries in all social sectors as per section 3(k)(VI); and
- (10) extent and manner of control over local plans and resources of the TSP as per section 3(k)(VII).

Status of Extension of 1996 Act to Tribal Areas⁴

The task force of the Rajiv Gandhi Foundation in its status report, 1999, published in March, 2000, has indicated the status of 1996 Act as under:

Andhra Pradesh	- Action initiated
Bihar	- Action initiated
Gujarat	- Extended Scheduled Areas Act in 1997
Himachal Pradesh	- Extended Scheduled Areas Act in 1997
Madhya Pradesh	- Extended Scheduled Areas Act in 1996
Maharashtra	- Action initiated
Orissa	- No action initiated
Rajasthan	- Extended Scheduled Areas Act in 1999

Social and Legal Issues

Regarding the powers of the Gram Sabha and customary mode of dispute resolution, it is to be considered whether:

- (a) Customary law, social and religious practices, traditions and customs of the people and the customary mode of dispute resolution fit in the present legal system, specially when there are contradictions between the customary law and codified law. Customary law does not guarantee maintenance to women, does not treat women equal to men, orders social boycott or even orders families to leave the village, etc. What law should prevail in the tribal society in case of conflict?
- (b) Educated tribals ignore the orders of village Patel, Mukhiya or Gameti, specially when they marry a second wife and

leave the first wife at her mercy, even without the right of maintenance. Generally, educated families do not care to approach village Gameti or the Gram Sabha and they take resort to the normal law. Thus, customary law will be restricted only to the uneducated, backward and poor people living in the village and when both the parties are ready to abide by the verdict of Gram Sabha as per the customary traditions.

- (c) Major disputes in tribal areas are regarding abduction of married ladies or technical rape before formal marriage in free tribal society. Both the parties may agree for settlement of dispute as per the customary law, but will police not interfere in such cases under sections 366 or 376 of the IPC? It is one of the major source of police persecution in tribal areas.
- (d) Whether Hindu Marriage Act will also not apply to the tribals regarding succession, maintenance, remarriage or rights of women in property being a progressive law?
- (e) With the advent of education and development and increasing urbanization, how long cultural traditions will be able to survive and the institution of the village Gameti or Patel will command confidence of people in general? Customary law may cause resentment in a dynamic society.
- (f) The Gram Sabha has no enforcement agency if one of the disputant parties do not agree to the verdict of the Gram Sabha.
- (g) The population of the non-tribals in the TSP areas is not concerned with tribal customs and traditions. They will always resort to codified common law. Thus, the application of customary law will be restricted to the willing tribals who have faith in the tribal Gram Sabha and agree to abide by the verdict of the village Gameti/Patel.
- (h) What will be the role of the elected Sarpanch in the Gram Sabha?

Economic Issues

As regards traditional management practices of community resources, like revenue lands, pasture lands, forests, mining and minor irrigation tanks, it is to be considered:

- (a) Will the Forest Department hand over non-reserved forests for plantation, management and collection of forest produce for the family needs of the tribals, especially in view of the Central Forest Law and the Supreme Court judgments?
- (b) The Tribal Area Development Cooperative Corporation has presently an exclusive right of minor forest produce collection through Large Multi-purpose Societies (LAMPS) and Primary Agriculture Cooperative societies (PACs) and fisheries development in irrigation tanks. TADCC will have to wind-up and allow these rights to the tribal Gram Sabhas.
- (c) Will the Forest Department allot tendu leaf collection to the tribal Gram Sabha or the cooperative of the tribals?
- (d) What will be the enforcement agency for restoration of alienated lands of the tribals? Will the Tehsildar come to obey the Gram Sabha for such purpose or removal of encroachment by trespassers in pasture lands, pathways and other common lands?
- (e) In case of mining lease or license, if non-tribal applies in the name of tribal labourers, wins over the village Gameti or Patel and gets a license, will it be possible for the Gram Sabha to ensure that the benefits of mining flow to the tribals? Alternatively, after a No Objection Certificate (NOC), will it be possible for the Gram Sabha to cancel such an NOC fraudulently obtained?
Regarding the utilization certificate to be obtained from the Gram Sabha for plans and programmes:
 - (a) Will it be practicable for a panchayat to honour the decisions of the Gram Sabha of the respective villages within the meagre sum below Rs. 1 lakh for the Jawahar Gram Smriti Yojna? How will priorities be fixed? Which

Gram Sabha will issue utilization certificate? Gram Sabha may be for each 'Fala' or 'Pal' or village. Gram Panchayat consists of many revenue villages.

- (b) Who will decide in case a conflict arises between the opinions of different Gram Sabhas within a panchayat circle?
- (c) Who will preside over the Gram Sabha when there are more than one Gamei or Patel in the village? Who will sign the utilization certificate on behalf of the Gram Sabha? All such procedural details will have to be clarified.

Regarding the acquisition of land in the tribal areas for development projects, it may be noted:

- (a) that consultation is mandatory;
- (b) but consultation of the Gram Sabha shall not be binding or mandatory for implementation on the government.

Other Issues

As regards the powers under the Rajasthan Excise Act to enforce prohibition or to regulate or restrict the sale and consumption of any intoxicant, the decisions of the different Gram Sabhas may not be uniform:

- (a) It may be difficult to implement the decisions village-wise.
- (b) The Ganganagar Sugar Mills will have to close down all government-run country liquor shops if the Gram Sabhas decide to close them. At the same time, as per customary law, Mahua liquor may be permitted to be manufactured and consumed on religious and social occasions as per the tribal customs and traditions.
- (c) How will control over money-lenders be enforceable by the Gram Sabhas? It will have to be explicitly clarified in the Act or the Rules.
- (d) The power to exercise control over institutions and functionaries in all social sectors, e.g., schools, anganwadi, medical sub-centres, PHC, veterinary dispensaries, public distribution system, etc., will have to be

entrusted to the panchayats through gazette notification. Whether, and to what extent, it will be practicable, seems doubtful, specially in view of lack of staff, resources and effectiveness of the PRIs.

Conclusion

During the last fifty years, efforts have been made to bring the tribals in the main stream of the society. Efforts have also been made to raise the economic and social status of the tribals in the TSP areas, as compared to other areas. Tribals have been enjoying the freedom to follow their own customs and traditions. They enjoy their fairs and festivals in their own colourful fashions. They can resolve their dispute through their Patel or Gameti without intervention from outside.)

Even then, in view of Article 244 of the Constitution, if tribal culture is to be preserved, traditional laws and customs can be divided into three categories:

- (a) Such traditions and customs which protect the economic interests of the tribals and empower them.
- (b) Such social traditions and customs which are against the spirit of progressive law of the land.
- (c) Such customs which hinder benefit of the development programmes to the tribals.

Provisions are welcome that empower the Gram Sabha to protect the economic interests of the tribals, like entrusting minor forest produce, water bodies, mining rights, identification of beneficiaries, approval of annual plans and annual accounts, arbitration of social disputes, consultation before land acquisition, power over moneylenders or for restoration of wrongfully alienated lands of the tribals, etc.

Among tribals, women are treated as property, which can be bought and sold. Women do not have property rights. She is persecuted in the male society. All these customs do not fall in line with the progressive laws of the country. It will be a moral offence to continue such traditions in the name of tribal culture.

However, protection is, of course, needed for the tribals when they face police atrocities on account of free sex in their society as per their customs. Technically, it may be termed as rape under Section 376 of IPC or abduction under Section 366 of IPC, but it is a common practice of *nata* or mateship before marriage as per tribal customs.

Traditions should also coincide with progress. Customs should also fit in the progressive law and the spirit of the Constitution. Equality of women should be honoured. The Gram Sabha should be empowered. Alienated resources of tribals must be restored. The tribals should be protected from police persecution or harassment of courts on account of the so-called technical offences. Economic progress, coupled with preservation of tribal culture, should be the motto. At the same time, the tribal must come within the mainstream of the society.

Notes

1. P.M. Bakshi, *The Constitution of India*, Universal Law Pub. Co., Delhi, 1998, p.73.
2. Bhuria Committee Report (1995), Government of India Publications.
3. Provisions of the Panchayats (Extension to the Scheduled Areas) Act 1996, Government of India, Gazette Extraordinary.
4. Panchayat Raj in India—Status Report, Rajiv Gandhi Foundation, March 2000, p.273.

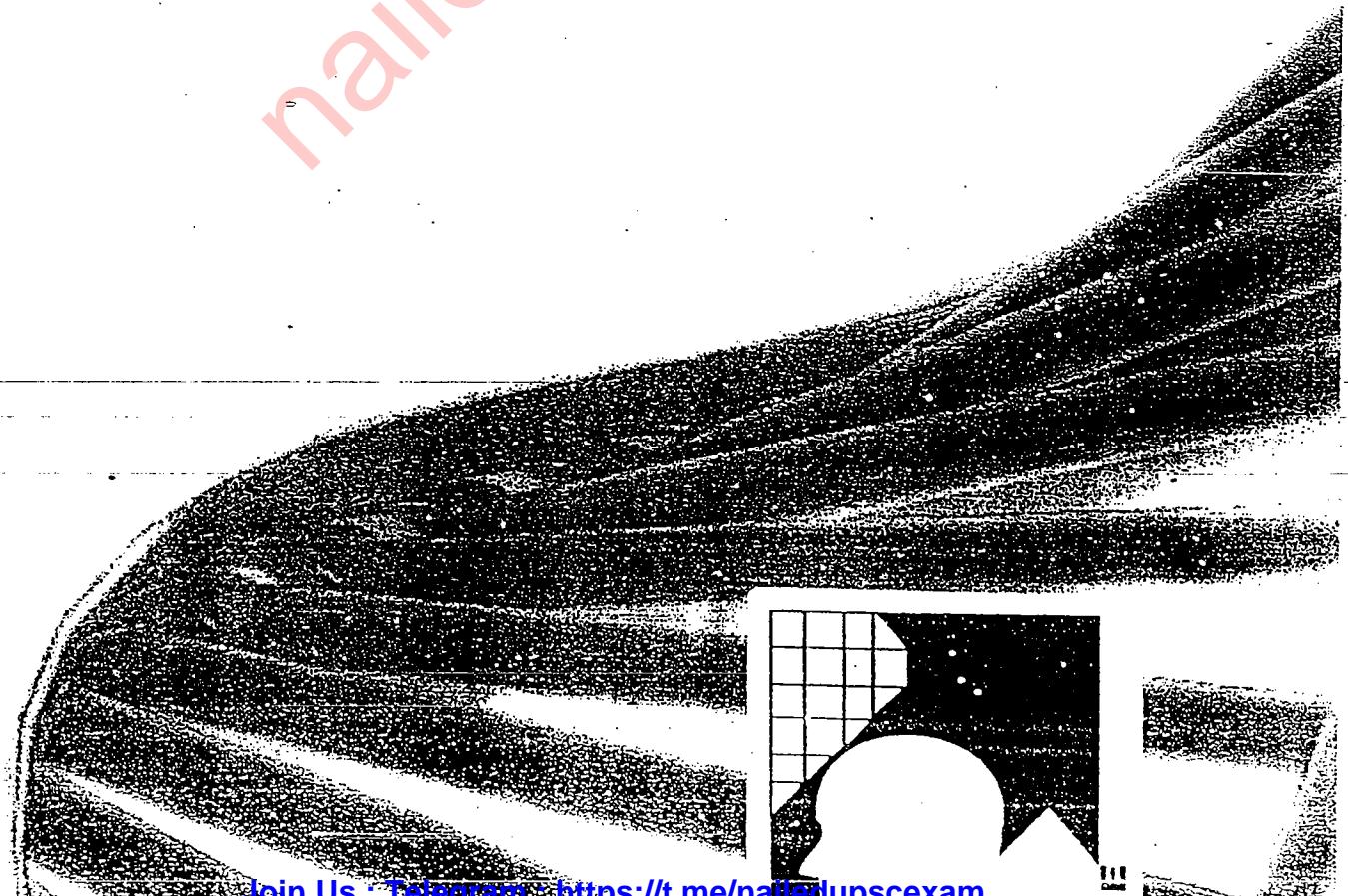
Vol. 2

Anthropology for Civil Services Examination

Socio-Cultural, Physical and Indian Anthropology

G.S. Kartic, M.A., [Ph. D] Anthropology

nailedupsc.com



Respiratory functions

- (1) Gas transfer - Transfer of O_2 from the alveoli to the venous blood & CO_2 in opposite direction.
- (2) Regulation of partial pressure of CO_2 (PCO_2) of blood

This important function is to keep the arterial PCO_2 at 40 mm Hg which is essential for many vital functions of the body.

- (3) Regulation of the pH of blood

Blood can be acidic by dissolving CO_2 in water of blood (carbonic acid). Blood should always have a constant pH. This is effected by buffers created by bicarbonate ions moving out of corpuscles to combine with Na^+ ions.

- (4) Excretion of certain volatile gases

Gases such as chloroform ($CHCl_3$), ethers, ammonia (NH_3) etc.

- (5) Pumping action

The rhythmic movement of diaphragm and chest wall causes alteration of pressure in the abdomen & chest cavity. This assists in drawing the blood from lower part of body to the abdomen and then to chest & thus helps maintain flow of venous blood to the heart.

For people living in high altitude, more red-corpuscles are produced to compensate for low PO_2 . Hence they develop rosy tinge of skin colour.

Vital capacity - is the total volume of air inside lungs
It varies with age, sex, size of individual.

It also shows racial variation.

$$\text{Males} = \text{height (cm)} \times 20 \text{ ml}$$

$$\text{Females} = " \times 16 \text{ ml.}$$

Europeans have higher ^{vital} capacity - Males = $h \times 25 \text{ ml}$
Females = $h \times 20 \text{ ml}$

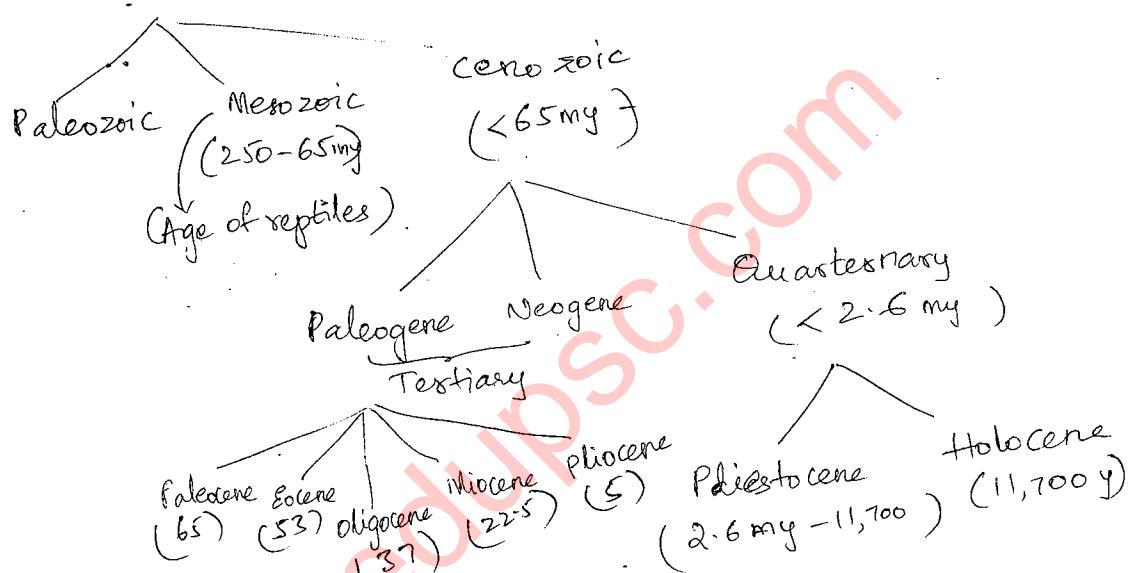
This diminishes with age & old people have less vital capacity.

Azoic Era - 4.5 b.ya - 3.5 b.ya

Proterozoic - 3500 - 600 mya
↳ 1st living organism

Precambrian - > 542 mya

Phanerozoic - < 542 mya



Life

↓
Domains

↓
Kingdom - Animal

↓
Phylum - chordates

↓
Sub-phylum - Vertebrates

↓
Class - Mammals

↓
Subclass - Eutheria (Placental Mammals)

↓
Order - Primate

↓
Suborder - Anthropoidea

↓
Family - Proconsul, Miocene fossil primates

↓
Genus - Proconsul, Dryopithecus, Australopithecus, Paranthropus

↓
Species

Glaciations in Pleistocene -
Worm
Rifts
Moldel
Gully

- Polygenic inheritance
- Genetic Drift
- Genetic effects of CM - p-hath-120

10. CONCEPT OF HUMAN GROWTH AND DEVELOPMENT	225
STAGES OF HUMAN GROWTH	225
PREGNATAL DEVELOPMENT	227
INFANCY	227
CHILDHOOD	228
ADOLESCENCE	229
MATURITY	231
SENCENCE	232
FACTORS AFFECTING GROWTH AND DEVELOPMENT	234
AGING AND SENESCENCE	236
BIOLOGICAL AND CHRONOLOGICAL LONGEVITY	239
THEORIES AND OBSERVATIONS	239
HUMAN PHYSIQUE AND SOMATOYPES	240
METHODOLOGIES FOR GROWTH STUDIES	242
11. SOCIAL DEMOGRAPHY	245
11.1 RELIANCE OF MENARCHE, MENOPAUSE AND OTHER BIOEVENTS TO FERTILITY	247
11.2 DEMOGRAPHIC THEORIES - BIOLOGICAL, SOCIAL AND CULTURAL	248
11.3 BIOLOGICAL AND SOCIO-ECOLOGICAL FACTORS INFLUENCING FECUNDITY, FERTILITY, NATALITY AND MORTALITY	250
12. APPLICATIONS OF ANTHROPOLOGY	256
ANTHROPOLOGY OF SPORTS	273
NUTRITIONAL ANTHROPOLOGY	273
DESIGNING OF DEFENSE AND OTHER EQUIPMENTS	274
(FORENsic ANTHROPOLOGY, METHODS AND PRINCIPLES OF PERSONAL IDENTIFICATION AND RECONSTRUCTION	276
APPLIED HUMAN GENETICS	278
PATERNITY DIAGNOSIS	282
EUGENICS	283
DNA TECHNOLOGY IN DISEASES AND MEDICINE	283
SEROGENTICS	286

Table of Contents

1.4. HUMAN EVOLUTION AND EMERGENCE OF MAN	7
A. BIOLOGICAL & CULTURAL FACTORS IN HUMAN EVOLUTION	7 ✓
B. THEORIES OF ORGANIC EVOLUTION.....	11
PRE-DARWINIAN PHASE.....	12
THE DARWINIAN PHASE.....	14
THEORY OF NATURAL SELECTION (DARWINISM).....	14 2012
POST-DARWINIAN PHASE.....	17
C. SYNTHETIC THEORY OF EVOLUTION.....	17 2011
BASIC CONCEPTS AND TERMS IN EVOLUTIONARY BIOLOGY	23 ✓
CONVERGENCE.....	23
PARALLELISM.....	23
HOMOLOGY AND ANALOGY.....	24
ADAPTIVE RADIATION.....	24 2012
DOLLO'S LAW.....	25
MOSAIC EVOLUTION - THE EVOLUTION OF PARTS AND WHOLES.....	25
COPE'S RULE.....	26
PRINCIPLE OF COMPETITIVE EXCLUSION OR GAUSE'S RULE.....	26
1.5 CHARACTERISTICS OF PRIMATES.....	26
PRIMATES EVOLUTIONARY TRENDS.....	26
PRIMATE TAXONOMY & BEHAVIOR	31 2011
TERTIARY AND QUATERNARY FOSSIL PRIMATES.....	42
A COMPARATIVE ANATOMY OF MAN AND APES.....	51 2017
PRIMATE ADAPTATIONS - ARBOREAL AND TERRESTRIAL.....	54
SKELETAL CHANGES DUE TO BIPEDALISM AND THEIR IMPLICATIONS	58
1.6 PHYLOGENETIC STATUS, CHARACTERISTICS, AND DISTRIBUTION OF HUMAN FOSSIL ANCESTORS.....	68
(A) PLI- CENEZOIC FOSSILS, SOUTHERN AFRICA AND EAST AFRICA - AUSTRALOPITHECINES.....	68 2012
(B) HOMO ERECTUS.....	67 2011
(i) Africa (Paranthropus) → HOMO ERECTUS HEIDELBERGENSIS	70
(ii) Europe → HOMO ERECTUS HEIDELBERGENSIS	70
(iii) Asia (H. j. javanicus) (H. Pekinensis) (H. erectus)	70 2011
(C) NEANDERTHAL MAN	70
(i) La-Chapelle-aux-saints (classical type), (ii) Mt.Carmel (progressive type)	70 2011
(D) RHODESIAN MAN	76
(E) HOMO SAPIENS	77
CRO-MAGNON MAN	77
CRIMALDI MAN	78
CHANCELADE MAN	79
1.7 THE BIOLOGICAL BASIS OF LIFE.....	80
THE CELL.....	80
DNA STRUCTURE.....	87
DNA REPLICATION	90
PROTEIN SYNTHESIS	92
GENE, MUTATION	99
CHROMOSOMES	100
CELL DIVISION	101
1.8 HUMAN GENETICS - METHODS AND APPLICATIONS	107
PEDIGREE ANALYSIS	107
THE TWIN METHOD	110

(MR)	CO-TWIN METHOD	114
	FOSTER CHILD	114
(MR)	CYTOGENETIC METHOD	115
	CHROMOSOMAL AND KARYOTYPE ANALYSIS	115
	BIOCHEMICAL METHODS	115
	IMMUNOLOGICAL METHOD	117
	RECOMBINANT DNA TECHNOLOGY	118
	<i>Application of Mendel's laws</i>	
9.2	MENDELIAN GENETICS IN MAN	121
	THE MENDELIAN PRINCIPLES	121
(MR)	SINGLE FACTOR, MULTIFACTOR AND POLYGENIC INHERITANCE IN MAN	126
	LETHAL GENE ACTION	127
9.3	CONCEPT OF GENETIC POLYMORPHISM AND SELECTION	129
	GENETIC POLYMORPHISM AND SELECTION	130
(MR)	MENDELIAN POPULATION	130
	GENETIC EQUILIBRIUM	130
	HARDY - WEINBERG EQUILIBRIUM	133
	CAUSES AND CHANGES IN GENE FREQUENCY	133
	CONSANGUINEOUS AND NON-CONSANGUINEOUS MATING	134
	GENETIC LOAD	138
(MR)	GENETIC EFFECTS OF CONSANGUINEOUS AND COUSIN MARRIAGES	139
	140	
9.4	CHROMOSOMES AND CHROMOSOMAL ABERRATIONS IN MAN	141
	NUMERICAL AND STRUCTURAL ABERRATIONS	142
	SEX CHROMOSOMAL ABERRATIONS	142
	AUTOSOMAL ABERRATIONS	144
	GENETIC IMPRINTS IN HUMAN DISEASES	145
	GENETIC SCREENING	146
	GENETIC COUNSELING	148
	HUMAN DNA PROFILING	148
	GENE MAPPING & GENOME STUDY	150
(MR)	THRIFTY GENOTYPE - 158	154
9.5	RACE AND RACISM	159
	RACE & RACISM	159
	BIOLOGICAL BASIS OF MORPHOLOGICAL VARIATION OF NON-METRIC AND METRIC CHARACTERS	161
	SEROLOGICAL AND GENETIC CRITERIA	166
	RACIAL CRITERIA, RACIAL TRAITS IN RELATION TO HEREDITY AND ENVIRONMENT	171
	RACIAL CLASSIFICATION AND DIFFERENTIATION	175
(Race coding?)	9.6 AGE, SEX AND POPULATION VARIATION	183
(MR)	9.7 CONCEPTS AND METHODS OF ECOLOGICAL ANTHROPOLOGY	187
	BIO-CULTURAL ADAPTATIONS - GENETIC AND NON GENETIC FACTORS	189
	MAN'S PHYSIOLOGICAL RESPONSES TO ENVIRONMENTAL STRESSES	192
	HOT DESERTS	192
	COLD HIGH ALTITUDE CLIMATES	194
(Respiratory functions)	9.8 EPIDEMIOLOGICAL ANTHROPOLOGY	197
(MR)	CONCEPT OF EPIDEMIOLOGICAL ANTHROPOLOGY	197
	HEALTH AND DISEASE	197
	INFECTIOUS AND NON INFECTIOUS DISEASES	199
	INFECTIOUS DISEASES	200
	NUTRITIONAL DEFICIENCY DISEASES	202
	217	

~~biological changes~~

Expansion of brain

↓
Expansion of head

difficulty in delivery

modification in female body
(posterior rami of spine)

widening of hip
enlargement of pelvic opening

Hunting

Exploring large areas

↓
Encountering novelty

Making plans

↓
Increased pressure on brain

Expansion of frontal lobes

areas of cortex.

bring food home
to cook

↓
Spending time in caves increased

↓
improved family relations

Necessity for speech

Fire

↓
cooked meat

↓
decrease pressure on Jaw

↓
Decrease size of Jaw & Teeth

Anthropology Paper 01 - Volume 01

↓
Improvement in language

↓
Emergence of language

1.4. HUMAN EVOLUTION AND EMERGENCE OF MAN

A. BIOLOGICAL & CULTURAL FACTORS IN HUMAN EVOLUTION

have reinforced each other & led to human evolution.

Each stage of hominid organic evolution was accompanied by major advances in cultural evolution.

Hominization Process: Hominization Process is the evolutionary transformation of hominoids into hominids. It is a process that occurred in the hominid line since its divergence from the last common hominoid ancestor shared with any living ape. The term is applied to include all those aspects of structural and behavioral changes that occurred in the hominid line finally leading to the evolution of modern man. These changes essentially constitute the essential biological and cultural factors that contributed to human evolution.

1. Erect Posture & Bipedal Locomotion

Perhaps the most obvious thing about human beings that differentiates them from all other members of the animal kingdom is their upright posture and their associated habit of walking (known technically as bipedal motion). Many of the distinctively human morphological traits are directly attributable to these two facts of human life.

The shape of the vertebral column in mammals is delicately adjusted to support the animal's center of gravity. In a buffalo this point is over the forelegs, and its backbone resembles the profile of a cantilever bridge with the weight carried on a central pillar. In Anthropoidea, the center of gravity is shifted back considerably and the vertebral column is unusually flexible for quadrupeds - features that reflect a tree-dwelling way of life, featuring agile grasping and jumping with strong rear leg thrusting. The stresses put on the backbone by brachiating resulted in its becoming somewhat stiffened, with several lumbar vertebrae becoming thoracic vertebrae. This fact suggests that humans are more closely related to brachiators than non-brachiating primates: quadrupedal monkeys have an average of 9 lumbar vertebrae and 10 thoracic vertebrae; gibbons average 6 and 13 respectively; great apes 4 and 13; and humans 5 and 12.

(a)
Vertebrae

Characteristics of the human vertebral column that are specific adaptations to an upright posture include:
 1 enlarging of the lower vertebrae to absorb the forces of compression; relative constancy in the size of the spines protruding from each vertebra, resulting from a lack of weight-bearing stress points along the spine (as opposed, for instance, to the gorilla, in which the spines of the neck vertebrae are elongated to provide a solid anchor for the heavy neck muscles that must support the forward-jutting head - unnecessary in humans, where the head is nicely balanced on top of the vertebral column); increase in the size and number of bones in the sacrum to take up the transmission of weight through the pelvis and legs (humans average 5-6 sacral bones, great apes around 5, quadrupedal lower primates 2-4); and finally, a sharp backward curving of the spine in the lumbar region (lower back) providing a solid platform to transfer the weight of the body onto the pelvis and giving the human spinal column its distinctive S-shape.

It is observed that these and other human features emerged as our ancestors became increasingly bipedal. True enough, many have mostly teeth and jaw fragments from Ramapithecus, but we think that these creatures spent a great deal of their time on the ground, on the fringes of the forests in the Miocene epoch; and if we remember that primates developed their vision rather than their sense of smell, standing on hind legs might well have been crucial for spotting the abundant meat-eating predators for which Ramapithecus - with no specialized defensive weapons - must have been an attractive and even easy meal. Thus we can speculate that there were strong selective pressures (in the form of carnivores) on Ramapithecus to develop highly cooperative social groups, an efficient communicative code (depending on sounds rather than visual signals that would be difficult to see in the tall grass), and the habit of

(b) Foramen magnum moving towards centre of base of skull.

Anthropology Paper 01 - Volume 01

rearing up on the hind legs to scan the countryside for danger. Certainly, these features became the principal adaptive characteristics of subsequent hominid groups.

* Australopithecines are already clearly bipedal and erect, although certain human features had not yet completely evolved: the pelvis is not yet broadened and rounded as much as in modern humans (for support of the internal organs as well as the enhancement of the passing of a large-brained infant at birth), although it is already much broader and rounder than in modern great apes; the lumbar curve is not yet fully developed; and the foramen magnum (the hole through which the spinal cord passes out of the skull and into the vertebral column) into the rear of the center of the base of the skull, meaning the head was not yet fully balanced at the top of the vertebral column. On the other hand, their feet were nearly modern; they had arches front-to rear and sideways and a full heel to provide good walking leverage, as we do. It appears that Australopithecines developed persistence hunting - pursuing game until the game was exhausted - as a major survival technique that put a premium on long distance walking. In any event, walking must have been of extreme importance to the Australopithecines because by the time of Homo erectus, the skeletal structure (with the exception of the head) was essentially fully modern, completely adapted to walking. Even the skull shows adaptation to erect posture, with the shifting forward of the foramen magnum closer to the center of the base of the skull.

Thus by the time Homo erectus trekked out across the continents of the old world, virtually all of the uniquely human traits associated with erect posture and bipedal locomotion had evolved.

2. Remodeling of Face & Teeth

When an infant primate is born, it passes out of its mother's womb through the birth canal, through the vagina, and into the realities of social life. The birth canal is surrounded by the pelvis that forms the lower front of the mother's pelvis. This bone sets a limit on the size that a newborn infant can be at the moment of its birth: if it (or any part of it) is too large it will get stuck, with the result that both the infant and the mother are quite likely to die - which means that, they will not contribute their genes to the ongoing evolutionary process.

It was noted that a major trend of human evolutionary development was a dramatic increase in the size of the brain, which we deduce from the fossil evidence showing a rapid increase in the size of the brain case since the Australopithecines. Since the size of the head as a whole should not keep getting larger beyond limits allowed by the process of birth, there was a strong adaptive pressure to shorten the snout and reduce the size of the face to make room for cranial expansion in the course of human evolution. Fortunately, other processes came into play that made this possible.

But first, what changes took place in the face and teeth among our hominid ancestors? Already with the arrival of Ramapithecus we can see some hominid facial trends. The upper and lower canines interlock only slightly, and there is little or no space (diastema) next to the canines to make a room for such interlocking. Australopithecines continue this trend, although the face and jaw are still massive by modern standards. Heavy ridges of bone arch over the eye sockets, probably affording a measure of protection as well as a shelf against which some of the large jaw muscles could be anchored. Indeed, in robust forms, the sagittal crest running from front to back on the top of the skull provides more space for such attachments. For all practical purposes, Australopithecines display little in the way of foreheads, although the gracile line shows some movement in that direction. Neither Ramapithecus, nor the Australopithecines, nor even Homo erectus have any chin whatever; in fact, many still have a ridge of bone running part-way back which forces the front teeth to protrude outward. All three groupings have very large teeth (in proportion to the whole head) by modern standards.

The face of Homo erectus is by far its most primitive aspect. It is still massively jawed, with a minimal forehead sloping sharply back from heavy bone brow ridges. The skull narrows sharply behind the eye

sockets, providing a groove along which the large cheek muscles that operate the jaws can run. Its front teeth still "buck" outwards and its nasal cavity, palate, and tongue are long and flat compared to those of modern humans, while its larynx sits much higher than in its throat than ours. And of course, its head hangs slightly forward, somewhat awkwardly balanced on its vertebral column, with a foramen magnum that is still somewhat behind the center of the skull's base. But in virtually every other respect *Homo erectus* has essentially modern skeletal features.

Even Neanderthal - the earliest member of our own species *Homo sapiens* - retained a heavy-looking face and large teeth by modern standards, especially, the "classical" Neanderthal of southwestern Europe. However, by this time we can observe the emergence of a real forehead (although some specimens still retain the heavy brow ridging of *Homo erectus*); the front teeth are rooted vertically, and the lower jaw that supports them juts out beyond them to give them a solid base; and a fully modern chin has developed.

These developments are further elaborated in the transition to fully modern *Homo sapiens*: the brow ridges diminish; the forehead approaches being vertical; the chin is prominent; the face (with its small vertical teeth) is flat, with a nose that protrudes. The foramen magnum is now exactly at the center of the skull's base, the head balancing nicely on the vertebral column. The nasal cavity and palate are shortened and arched, the tongue thickened and shortened, and the larynx sunken down into the throat, which for the first time joins the mouth pretty much at a right angle rather than obliquely.

(X)
Factors that caused change
Le discovery of fire

Many factors brought about these changes. First, the trend toward upright posture resulted in the foramen magnum being moved forward, tilting the head upright into a vertical position and possibly exerting some "squeeze" against the face. Second, the long, flat mouth, tongue, palate and nasal cavity with a high larynx and the wide angle at which the throat joined the mouth prior to *Homo sapiens*, drastically limited the number of sounds the vocal apparatus could produce and the speed with which it could produce them. If, the evolution of speech were of crucial importance to the overall process of human evolution, then there would have been selective pressures for molding the face in the form it finally assumed. In fact, there is evidence that the mouth and tongue of Neanderthal are still too flat to produce the modern range of sounds, and also probably lack enough quickness of tongue to produce sounds at a modern rate. Finally, it appears that human teeth only really were free to become small when people gave up using the mouth as a "tool" - a "fifth hand" used for holding, tearing, and even chewing items to soften them (as Eskimos soften skins). This happened in the last 10,000 years with the development of food production, when the agricultural revolution replaced hunting and foraging as the principal means of subsistence for most of the peoples in the world.

3. Expansion & Development of Brain

There is a dramatic increase of the brain case as we approach specimens of *Homo sapiens*. This is indeed worth noting, and physical anthropologists have spent a great deal of time studying the rapid increase in brain size in the course of post-australopithecine evolution. Why did it happen?

The reasons are complicated. First, in general, the overall size of our ancestors increased at each evolutionary stage. We concluded that there were strong selective pressures for this increase in size, probably because a larger body size made it easier to hold and use tools, and also increased the amount of muscle available to hunters and foragers on long treks.

Stronger selective pressures for a big brain

But the brain grew larger, proportionately did the body. The most likely reason is that an increase in brain size tremendously increases the possibility - indeed the probability - of an increase in both the number and kinds of connections between the brain cells. It is an increase in the kinds of connections between brain cells that is apparently responsible for the emergence of new kinds of mental operations such as thinking and using language, operations that are fundamental to human existence.

Anthropology Paper 01 - Volume 01

By carefully studying the contours of the insides of fossil brain cases, scientists have been able to document that the tremendous growth in brain size between the Australopithecines and Homo erectus was accompanied by an increase in size and complexity of the outside surface of the brain called the Cerebral Cortex. This expansion of the cortex is the most recent evolutionary development of the brain, and it is the cortex that is primarily associated with thinking and language use.

Each of the senses is represented in a specific area of the cortex, a part of the outer layer of the brain, where the fibers carrying messages from the surface of the body concentrate according to the sense. Thus, for example, stimulation of the retina in the eye ball results in messages flashing along the optic nerve fibers and flooding into one area of the cortex; messages from the fingers (touch) arrive in another area; taste messages in yet a third area, and so forth. The areas of the brain that are specialized to process these incoming messages are called the nuclear zones of cortex; and each sense has its own.

Around each nuclear zone anatomists have found that specialized bundles of fibers are concentrated into what are called association areas; and the clear differentiation of separated association areas increases as we move up the order of the Primates towards human beings. Now the job that each association area performs is very complicated, but it amounts to modifying the operation of its nuclear zone. For example, damage to the visual association area in the human brain results in the person losing his or her ability to identify the objects, even though the objects are still seen (the messages are still represented in the visual nuclear zone). It appears, then, that the association areas of the brain are central to the process of recognition. They are where information about the outside world is stored, where incoming stimuli can be matched against stored experience and decisions can be made: upon seeing a Saber-toothed tiger, one can decide to issue a warning to one's neighbors and take to one's heels - or alternatively, face the predator and try to convert into a mouth of meals. In humans large bundles of nerve fibers connect the association areas of the cortex. This provides us with the ability to pass messages back and forth directly between these association areas, to compare and contrast their different recognitions - in other words to think.

The cortex also houses the nuclear zones for triggering muscle actions (motor functions). An outstanding characteristic of Anthropoidea is that they have evolved direct link ups between the association areas of sight and touch and the association areas around the major motor function centers. These direct link ups result in the ability to "fit" ones bodily movements to what ones sees and holds, while freed from other functions of the brain - such as emotions - that might interfere. Thus, if you think about it for a moment, you will see that these structural features of anthropoid brains amount to being a necessary precondition for using tools. In other words, regardless of why the anthropoids acquired these features, without them regular tool use - a preeminent specialty of our hominid ancestors as they evolved - could not have developed.

Many important aspects of Brain seem to have evolved as speech specializations.
4. Culture and Hominization Process Verbal Comm was so adaptive that strong selective pressures molded these changes.

Each stage of hominid organic evolution seems to have been accompanied by the major advances in cultural evolution. Because stone tools are relatively indestructible, much of early cultural evolution is represented by the evolution of tool industries.

(1) The importance of tools as molders of hominid evolution has been recognized for a long time. Upright posture, leaving the hands free to manipulate objects and carry things from long distances, certainly is dynamically connected with the adoption of tool use by early hominids. In order for a tool to be useful, one must have it with him when the moment arises to put it to work. This takes making the tool in advance - planning; walking on two legs to free one's hands to carry the tool; and commitment to using the tool. To see how much of a commitment this represents, try carrying a brick around with you for a whole day. Those parts of the human brain most needed for manipulating tools are very evolved. Aside from the ones mentioned, other highly developed areas include the frontal lobes that organize behavior

(2) Discovery of fire → (page 1 diagram) → Group living - Cognition
G.S. Kartic (karticsg@gmail.com)

into sequences and the motor association areas that control the fingers and the thumbs. The hand itself is marvelously evolved. It combines the powerful curled-fingered grip with which heavy objects can be moved, with the delicate manipulations possible when small objects are held between the fingers and the thumb (and the ability to fully oppose the thumb to all the fingers is uniquely human).

Thus, much of what we take for granted about man today is the result of natural selection operating on his ancestors, adapting them to an environment he himself has created (or began to create): tools. But culture is more than just tools. One of the most important features of culture is language, which also profoundly influenced and was influenced by human evolution.

Language and evolution:

There are three areas of the brain that are highly evolved in humans and appear to be crucial for human linguistic ability. One is called Broca's area and is located toward the front of the dominant side of the brain. This area activates, among things, the muscles of the jaw, lips, tongue, and larynx. The second is Wernicke's area, which is found in the temporal lobe of the dominant side of the brain. It is connected to Broca's area by a large bundle of nerve fibers (called the Arcuate Fasciculus) and is the brain site where verbal comprehension takes place. The third area is the Angular Gyrus, situated next to Wernicke's area serving as a link up between parts of the brain that receives stimuli from the sense organs of touch, hearing and sight.

Man could not possibly speak without these brain areas. It is interesting to note that all three are located in the cortex - the "new" brain - which, as already been emphasized is most evolved in humans and appears to have first approached its modern size and complexity in Homo erectus. The fact that all three are located in the cortex allows sensory inputs and verbal representations to be connected with each other without having to go through the "old" brain - especially the limbic system, which activates such very basic responses as aggression, fear, hunger and sexual arousal. Consequently, human beings can think, talk and experience the world without involving these "gut-level" states. Other animals, including our primate relatives, have not developed these brain areas nearly as much as man has. Thus many important aspects of man's brain seem to have evolved as speech specializations; and it can be reasonably supposed that verbal communication was so adaptive for the man's ancestors, that strong selective pressures molded these changes. Certainly, language is a principle cornerstone of human existence.

These, then, are the major themes that characterize human evolution; erect bipedalism, reduction of face, and expansion and development of the brain. All these themes interacted with each other, and all are dynamically connected to the evolution of social groups and culture - the primary mechanisms of human adaptation.

B. THEORIES OF ORGANIC EVOLUTION

(PRE-DARWINIAN, DARWINIAN & POST-DARWINIAN)

Meaning Of Organic Evolution: The English philosopher Herbert Spencer first applied the term "evolution" to denote the historical development of life. Evolution means change. The term "evolution" may be defined in several ways. Thus, we can speak of the geological evolution or evolution of planet earth, evolution of solar systems and the evolution of the automobiles, radios, telephones etc.

The changes involved in the rise of human civilization can be called cultural evolution. In the same manner, the term "organic evolution" is applied to the changes that have taken place in the living things, viz., plants and animals. The whole idea of evolution probably started with Charles Darwin, who defined evolution as descent with modification. The word "descent" refers to the process of origin of new species from an ancestral stock. The word "modification" introduces an idea of change that is inherent in evolution. Thus, the term "organic evolution" may be explained in another way, i.e., the origin of new species of animals and plants from ancestors who previously lived on the earth.

There are two different types of development, viz., ontogeny, and phylogeny. "Ontogeny" is primarily concerned with the history of development of individual organisms. Thus, for example, man begins his life as a single cell, which undergoes a complex process of development and finally culminates in a multi-cellular adult. These ontogenetic changes are of great importance only to embryologists. But, a student of evolution is primarily concerned with the second kind of development, which has been referred to as phylogeny. "Phylogeny" deals with the evolution of a genetically related group of organisms, in contrast to the development of the individual organism.

PRE-DARWINIAN PHASE

- The rules of heredity have always intrigued humans for ages. In the fourth century B.C., Theophrastus, a Greek, has written a book on seed germination. Some early Greeks believed that heredity among humans was a question of which sex dominated in the sex act. Linnaeus suggested a two-layered theory, which held that "the outer layer including the vascular system is derived from the father, the inner layer including the nervous system comes from the mother". The theory of pre-formation, dating as far back as Aristotle was based on the belief that "the development of an organism is no more than unfolding of that, which is already present in miniature. Every organism must therefore contain in its reproductive organs an infinite series representing all of its future descendants". Ovists believed the female possessed this future of the series, and the spermists insisted it was the male.

- While there were differences of opinion about the role of sex and ignorance of the laws of animal heredity, plants were not generally discussed in these terms. That plants lacked sexuality was the conventional wisdom of the day. Not until the end of the seventeenth century was the presence of sex organs in plants demonstrated in the experiments performed in Germany by Rudolph Camerarius. The discovery of sexual reproduction of plants was a notable achievement because it makes possible an experimental approach to plant hybridization. Once begun by Camerarius, crossing hybrids and observing what regularities might occur among the offspring became one of the most popular methods of investigating the laws of heredity.

- Through hybridization experiments, which continue in the 18th and 19th Centuries, people were able to work out the rules of heredity. Though many investigators worked on hybrids, the secrets of hybridization, however, eluded them. What the early experimenters saw were offspring in a confusing array of forms and colors, which they were unable to explain. Their conclusion - there probably were no universal laws of heredity! Thus, the matters stood more or less at a standstill as far as the laws of heredity were concerned, until Gregor Johaan Mendel solved the enigma in the 1860s.

THEORY OF INHERITANCE OF ACQUIRED CHARACTERS (LAMARCKISM)

The theory of inheritance of acquired characters states that modifications which the organism acquires in adaptation to the environments which it meets during its life time are automatically handed down to its descendants and so become part of hereditary.

- 1 A renowned French naturalist, Lamarck shortly after the occurrence of French revolution, propounded this theory. As a result of his systematic studies he became convinced that species evolve continuously. This idea was in total conflict with the view of the period - fixity of species. As a result Lamarck's views were challenged by most of the biologists of that time, particularly by Georges Cuvier. In 1809, Lamarck published "Philosophic Zoologique", which included his theory explaining the changes that occur in the formation of new types. Although his views on evolutionary mechanism are outmoded now, he still occupies a very important place in the history of evolutionary thought. He was the first evolutionist to conclude that evolution is a general fact covering all forms of life. His evolutionary ideas are discussed below.

Lamarck's Evolutionary Propositions

The Lamarckian theory may be summarized in four propositions: (Postulates)

Anthropology Paper 01 - Volume 01

Theory of Elan Vitae (or) growth

1. Living organisms and their component parts tend continually to increase in size.
2. Production of a new organ result from new need and from the new movement which this need starts and maintains. (Theory of environmental pressure & spontaneous formation of organs)
3. If an organ is used constantly, it will tend to become highly developed, whereas disuse results in degeneration. (Theory of use & disuse)
4. Modification produced by the above principles during the life time of an individual will be inherited by its offspring. (Theory of inheritance of acquired characters)

A ✓ Thus, Lamarck believed that organic changes seen in animals are a result of the influence of environment on gradual changes of species due to their tendency to become more and more perfect. According to him, when an animal's environment changes, its needs change and this leads to special demands on certain organs. Organs used more extensively would enlarge and become more efficient.

Conversely, an organ or organs no longer used would degenerate and atrophy. He postulated that such changed characteristics (acquired traits) would be transmitted to the offspring.

5 Ex ✓ To explain his theory Lamarck used examples like long neck of giraffes, limblessness in snakes, webbed feet of ducks, blindness of moles, and also dimorphism of submerged and aerial leaves in aquatic plants. He visualized the evolution of the giraffe as follows: An original deer-like animal finding the supply of grass and herbs inadequate, started to feed on the leaves of trees. It needed greater height to reach the higher leaves and in the process of reaching, its neck became longer and longer. In the course of generations the long neck became a more accentuated feature, and our modern giraffe was the result. Likewise, according to Lamarckian evolutionary theory, the webbed foot of an aquatic duck would have developed in the following way: The duck would stretch its toes apart to give more push during swimming. This new characteristic would be inherited, and the subsequent generation of duck would, upon stretching their toes, form a more defined web. Each generation would do the same until the webbed foot seen on ducks today was fully formed. This would then be passed on from generation to generation, essentially unchanged once the perfected state was attained. For plants, Lamarck accepted the theory of his compatriot St. Hilaire, who developed the notion that plant form is shaped by the combined effects of the environment.

✓ Significance of Lamarckism

1 Lamarckian theory was simple and it had some appeal as it provided a way in which changes in 2 organisms could come about. It was the first completely comprehensive theory that was offered. Furthermore, it was a theory that lent itself to predictions and therefore to testing. Thus, Lamarckian theory 3 enjoyed popular acceptance for about 70 years because it was exemplified by many common examples. Most persons know that exercise results in larger muscles, deep-sea fishes have rudimentary eyes, and carnivorous animals possess claws. The theory also afforded a means of explaining reduced or vestigial structures. Further, through disuse, the eyes of a cave animal might become functionless and might even disappear.

Critical Analysis of Lamarck's Propositions

Lamarck defended his evolutionary theory vigorously until his death. For it, he suffered both social and scientific ostracism. He was criticized for following reasons by the contemporary scientists during his lifetime and afterwards.

1. The first proposition of Lamarck suggests the tendency to increase in size. While the evolutionary trend in a certain groups of organisms may be associated with increase of size, there are many cases, where evolution proceeded not only without any increase in size but rather through a reduction in size. Many plants contradict the Lamarckian principle by showing such a reduction in size during

Ex:-
their evolution. Many ferns and conifers that became extinct were gigantic trees and the more highly evolved flowering plants are really much smaller in size.

2. The second Lamarckian principle that new organs result from new needs is quite manifestly false. In the case of plants, Lamarck believed that the environment acted directly upon the plant causing the production of such new characters as might adapt the plant to its environment. In the case of animals, he believed that the environment acted through the nervous systems; in other words, the desire of the animal leads to the formation of new structures. In its crudest form this would mean that a man who mused, "Birds can fly, so why can't I?" should have sprouted wings and taken to the air.
3. The third Lamarckian principle that organs will develop due to use and degenerate due to disuse may be correct as far as growth of an organ within the lifetime of an individual is concerned. For example, it is a commonly observed fact that if muscles are put to use these would develop. However, this principle is meaningful only when it is studied in relation to following fourth principle.
4. The fourth and final proposition of Lamarck was that the inheritance of characters acquired during the lifetime of the individual. This principle has been tested by many biologists through experiments and has found it entirely incorrect.

Experiments to Disprove Lamarckism:

1. The noted German scientist August Weismann was the first person who made a definite distinction between heritable changes and those which cannot be inherited. In 1890, he performed some experiments to test if characters may disappear due to disuse. This he did by cutting the tails of white mice for more than 20 generations to see if this has any effect on tail length. The measuring of tail length of the offspring of 20 successive generations revealed that on average, the tails were not shorter. It means that acquired character (cut tail in this case) was not inherited.
2. Castle and Philips performed transplantation experiments to show that environment has no effect on heredity. In one of the experiments they transplanted the ovary of a black female guinea pig into the body of white female guinea pig and the recipient female was mated with a white male guinea pig. They found that all the individuals from this pair were black. This shows that the environment does not affect the heredity as has been suggested by Lamarck.
3. Binding of ears and nostrils in Indian women has been continued as the tradition from centuries but their offspring do not show any trace of holes in ears and nostrils. The Chinese bind the feet of their women for many generations, yet this has not resulted in any modification of the feet of present day Chinese women.

THE DARWINIAN PHASE

THEORY OF NATURAL SELECTION (DARWINISM)

In 1858, two Englishmen published jointly in the proceedings of the Linnaean Society papers on a new concept of evolution. This concept, the theory of the natural selection was destined to influence greatly, the thinking of modern man in many different fields and to become the basis of most modern biological concepts of evolution.

One of these men, Alfred Russell Wallace (1823-1913) was a naturalist. In the year 1859, Darwin published a book, "The Origin of Species by Natural Selection" or "The Preservation of Favoured Races in the Struggle for Life". This book has been judged by many as the most important book of the nineteenth century, since it contained overwhelming evidence of the fact that evolution has and does occur, and presented a logical theory regarding the major mechanism of evolution and natural selection.

Darwin's Evolutionary Propositions

"The change in species by the survival of an organismal type exhibiting a natural variation that gives it an adaptive advantage in an environment, thus leading to new environment equilibrium, is evolution by natural selection".

✓ Thus, natural selection is a continuous process of trial and error on a gigantic scale for all of living matter is involved. It includes following elements:

3 The Universal Occurrence of Variation: Variation is the characteristic of every group of animals and plants and there are many ways in which organisms may differ. (Darwin and Wallace did not understand the cause of variation and assumed it was one of the innate properties of living things).

4 An Excessive Natural Rate of Multiplication: Every species in the absence of environmental check tends to increase in a geometrical manner. If a population of a given species doubles in one year and if there are no checks on its increase, it will quadruple the next year and so on. Such a great reproductive potential of different species may be easily observed in nature. It has been estimated that a common Atlantic Coast Oyster may shed as many as 80 million eggs in one season. A salmon produces 28,000,000 eggs in a season. A single pair of English sparrows would be the ancestors of over 275 billion individuals in 10 years if they and their descendants could reproduce at their natural rate without any check. Darwin calculated that even a pair of elephants, which are about the slowest breeding animals known, could, in the absence of any checks, have 29 million descendants at the end of 800 years.

Thus, more organisms of each kind are born than can possibly obtain food and survive. Since the number of each species remains fairly constant under natural conditions, it must be assumed that most of the offspring in each generation perishes. If all the offspring of any species remained alive and reproduced, they would soon crowd all other species on the earth.

5 Struggle for Existence: Since more individuals are born than those that can survive, there is an intra-specific or inter-specific or environmental struggle for survival - a competition for food, mates, and space. This contest may be an active killed or be-killed struggle, or one less immediately apparent but no less real, such as the struggle of plants or animals to survive drought or cold.

6 Survival of the Fittest: The consequent elimination of the unfit and the survival of only those that is satisfactorily adapted. Some of the variations exhibited by living things make it easier for them to survive while others have handicap that bring about the elimination of their possessors. This idea of "the survival of the fittest" is the core of the theory of natural selection.

7 Inheritance of Variations: The surviving individuals will give to the next generation their characters and in this way, the "successful" variations are transmitted to the succeeding generations. The less fit will tend to be eliminated before they have reproduced.

Successive generations in this way tend to become better adapted to their environment. As the environment changes, further adaptations occur. The operation of natural selection over many generations may produce descendants which are quite different from their ancestors, different enough to be separate species. Further more, certain members of a population with one group of variations may become adapted to the environment in one way, while others in a different way, or become adapted to a different environment. In this way two or more species may arise from a single ancestral stock.

Critical Analysis of Darwinism:

With the appearance of Darwin's book in 1859, a veritable storm of controversy broke out. Many people became interested in his presentation; the arguments (for and against) were often heated. The concept of natural selection was opposed primarily on ethical and religious grounds. But the sheer weight of evidence and the logic of Darwin's presentation finally convinced a majority of educated people. The concept of evolution affected many aspects of man's thinking and it will continue to do so. However, the

- ① Deals with Horizontal & Vertical aspects of evolution.
 - ② It is based on evolution by common descent.
 - ③ It emphasises that diversity is due to struggle for existence & favourable variations.
 - ④ Population is unit of evolution.
 - ⑤ Emphasizes modification of population.
 - ⑥ Nature selects organisms in a pop for evolution.
- This is missing.
- emphasises that diversity is due to intrinsic perfecting force namely clavis vitae.
Individual is Unit of evolution
Emphasizes modification of individual
Nature directs organisms for evolution.

Anthropology Paper 01 - Volume 01

2 idea of "the survival of the fittest" of Darwinism has been erroneously interpreted by many to mean survival only by "tooth and claw", an interpretation that has led in many cases to rationalizations for the attitude of "every man for himself" in social and economic affairs. In fact, the process of evolution is not at all "tooth and claw". Plants have evolved too and there is no bloody competition between them! In all forms, plants and animals alike, a part of the selective process involves the action of inanimate natural factors such as drought, moisture, temperature, etc. Active competition between organisms is a part of the process, but cooperation has in many cases been involved in survival. Natural selection results in the survival of those that are best integrated with the various factors of the environment in which they live.

3 The greatest weakness of Darwinism is that it did not explain the origin and transmission of variations. Although Darwin criticized many aspects of Lamarck's theory, he did not deny that acquired characteristics can be transmitted. He realized that the nature of inheritance was unknown, but he devised a working hypothesis called hypothesis of pangenesis to explain how acquired variations may be transmitted.

4 **Pangenesis Hypothesis:** Darwin's pangenesis hypothesis assumed that all the organs and perhaps all the cells in the body of an animal produced miniatures of themselves. These miniatures called gemmules or pangenesis were shed into the blood stream and carried to the sex glands (viz., reproductive organs, the testes, and ovaries) where they were assembled to form sex cells - the eggs or sperms. Later, when a fertilized egg undergoes development, the pangenesis present are responsible for the particular features of the new individuals. In this manner, environmental changes would produce modified organs which in turn would produce modified pangenesis that would transmit the change to the next generation.

5 In the year 1875, Galton made pangenesis hypothesis untenable by presenting several experimental proofs. He and others made a series of experiments involving blood transfusions and later transplants of ovaries between black and white varieties of rabbits and chicken. Gametes produced by the transplanted ovaries were consistent with the phenotype of the individual in which the ovary originated and not with the animal currently carrying the ovary. Blood transfusions had no effect on the gametes produced. These experiments readily demonstrated that the pangenesis hypothesis was incorrect.

Certain other demerits of Darwinism are discussed below.

6 1. Darwinism or natural selection theory does not account for the beginning of organs, which may appear at first as rudiments having as yet no selection value. In other words, it remains concerned with the survival of fittest but not for the arrival of the fittest.

5 2. Over specialization in certain cases like extinct Irish deer in which huge antlers outweigh the entire skeleton, or the immense spiral tusks of the Jefferson Mammoth, or huge dinosaurs of Mesozoic, all cannot be explained on the basis of continuous variations and natural selection. These organs or body structures should not have reached such a harmful stage if natural selection was operating. However, such case of over specializations have been explained by Darwinism as the basis of discontinuous variations or "sports", which according to him, do not play any role in evolution.

6 3. Natural selection cannot account for degeneracy. To say an organ is no longer useful and hence disappears is to state the effect and not the cause. If under some changed conditions, a character built up by natural selection becomes a menace, the reversal of selection can accomplish its removal but his theory will not explain this phenomenon.

7 4. One of the classical objections to natural selection is that new variations would be lost by "dilution" as the individuals possessing them breed with others without them. We now know that although the phenotypic expression of a gene may be altered when it exists in combination with certain other genes, but the gene itself is not altered and is transmitted to succeeding generations.

way

Theory of Pangenesis :-

- 1) Acc to Darwin, all somatic cells of an organism produce minute particles called pangen (^{which}) are present in germ cells
- 2) After fertilization the pangen of zygote dictate the devt of individuals
- 3) Pangen may lie dormant in one generation but may appear again in another generation
- 4) There is competition among the pangen. The stronger is preserved and weaker is eliminated

31-8

Concepts refuted by Darwin :-

1. ~~He rejected~~ The diversity of orgs found on earth was created (~~He rejected concept of creation~~)
2. The earth relatively new in the battle of Lord Kelvin, Darwin clearly emerged victorious & his estimate of organic life being several thousand million years old is now well established (Estd greater antiquity of organic life than estimated by other)
3. Emphasised all the phenomena that previously ascribed to design of creator was explained in terms of natural selection. (He rejected all ~~cosmical~~ phenomena as cosmic design, save ^{as} natural except Selection) He emphasised anthropocentrism.

Follow Us : nailedupsc.com; Facebook : [nailedupsc](https://www.facebook.com/nailedupsc); Twitter : [NailedIt009](https://twitter.com/NailedIt009); Instagram : [nailed_upsc](https://www.instagram.com/nailed_upsc/);

nailedupSC.Com

Join Us : Telegram : <https://t.me/nailedupsceexam>

4. Darwin and his followers showed conclusively that man is not separate creation but product of common descent.

→ Concepts introduced by Darwin:

1) Natural Selection:

Owing to vast reproductive surplus, there is intense competition for survival & repⁿ is certain genotypes have greater probability to leave a # offsprings than others

2) Thinking about popu :-

Living nature does not consist of types of popu but of variable popu in which each individual is unique. Darwin replaced typological thinking by popu thinking

3) Geographic speciation:

Diff popu undergo diff genetic modifications and if such popu are isolated, the genetec changes may be compounded to species differentiation.

4. Evolutionary Progress:

In what ever progress we find b/w first origin of life and existing biota is due to competition among species and to character divergence. Thus evolution shows progress & divergence.

→ Comparison of Lamarckism and Darwinism :

- 1) Both challenged the theoretical that world is constant and not undergoing any change (^{fixity in} species).
- Both deny that world is created in a day or thousands of years.
- 2) Darwin conceived the idea that similarity in species are due to common descent. This component is lacking in theory of Lamarck.
- 3) Both of them believed in the gradualness of evolution and discarded essentialism.

Weaknesses of Darwin's theory:

1. Darwin believed in pangenesis and blending of inheritance but modern geneticist say that genes from parents do not mix up but remains pure and segregate again. (No Dilution)
2. Darwin also believed that characteristics are controlled by one gene but this was disproved by geneticist esp. Morgan, Davis, Sturtevant.
3. Darwin laid too much emphasis on endinuclear differences. Now we know that endinuclear diff are caused by recombination which plays a ^{imp} role in causing variation.
4. Darwin did not assign primary importance to sports or mutations. Today mutation is known to be the only means by ^{which} new traits arise.

5. Even though Darwin criticized Lamarckism, he used Lamarckism theory of use and disuse to explain origins of certain variations.
6. According to Darwin, the variations are very small unless these variations continue upto adolescence. There effect on the org's cannot be found. However, in the struggle of existence, enders dieals rarely die upto adolescence. Only major variations will be of use in the formation of new species but not simple, insignificant, ephemeral variations.
7. If use and disease are emp. for acquiring and non-acquiring of new characters, those org's which have no use which do not serve any purpose shall disappear but, a many org's there are a good number of characters not any purpose. Their continuous presence even though they have no purpose can't be explained in the help of Darwinism.
8. According to Darwin a trait appears and continues its existence 'cuz it proves to be beneficial to its org but there are cases of certain types of org which have acquired horns, tusks resp. Irish deer, elephant which have not proved to be beneficial. These have not proved to be beneficial such cases cannot be explained in the help of Darwinism.
9. The theory of sexual selection postures ♂♂ as active and ♀♀ as passive ones. In recent times the theory was proved otherwise.

pg 209 p. Nath

Neo-Darwinism :

The theory of Natural selection as modified by supporters of Darwinism is known as Neo-darwinism. In this regard Huxley, Weismann, Dobzhansky, Goldschmidt and several others tried to extend the theory of Natural Selection as one of the processes favouring evolution and at the same time identifying other processes helping evolution.

Weismann's theory of germ plasm.

Hugo-Denries theory of mutation, Seivall Wright's theory of genetic drift also have helped modification in the theory of evolution as given by Darwin.

- (a) In this regard Simpson and his followers say that Neo-darwinism is associated to Weismann's theory.
- (b) On the other hand, Dobson considers the contributions of De Vries, Weismann, Seivall Wright, Dobzhansky, Stebbins, Huxley, Haldane, Fischer etc as Neo-darwinism.
- (c) However, Samuel Butler, Ellis (pronounced as Elle) and E. Montague - present another point of view. They simply condemn struggle for existence as a key aspect of theory of evolution. They said it is not struggle for existence but co-operation which exists in every society of plants and animals. In fact, there is no struggle for existence. It is a question of

live & let live. Hence, struggle for existence is myth. The reality is in terms of cooperation as such it aspect uncovered by Darwinism shall be designated as Neo-Darwinism.

5. Darwin indirectly accepted the Lamarckian idea of inheritance of acquired characters in the form of pangenesis hypothesis, which cannot be accepted in the light of knowledge genetics made available later in that century.
6. Lastly, some people have objected to natural selection because it is essentially a materialistic doctrine, depending as it does, purely on the laws of chance.

POST-DARWINIAN PHASE

During later half of 19th century and at the beginning of 20th century many important ideas have been forwarded for explaining the inheritance of variations from one generation to successive generations and also for explaining evolution. Thus, the rediscovery of Mendel's laws of heredity by Correns and Tschermark made it clear that (1) the factors given to the offspring by the parents do not mix but are segregated and (2) if more than one pair of contrasting characters is considered in the same cross, the factors responsible for these are inherited independently. Likewise, mutation theory of evolution of Hugo de Vries (1866-1887) stated that new species arise by sudden changes or steps called mutations rather than by gradual processes. According to him, it was mutations and not selection that should be considered as the primary factor in evolution. Further, the studies of Wagner (1868) suggested the role of geographic or spatial isolation in the formation of every species, race, or tribe of animals or plants on the earth. Even more, certain population geneticists realized that the actual physical struggle between animals for survival or the competition between plants for space, sun and water is much less important as an evolutionary force than Darwin believed. The evolution of any given kind of organism occurs over many generations during which individuals are born and die, but the population has certain continuity. Thus, the unit in evolution is recognized not as the individual but rather a population of individuals.

A population of similar individuals living within a circumscribed area and interbreeding is termed a deme or genetic population. The next larger unit of population in nature is the species, composed of a series of inter-breeding demes. Further, in a population, the relative frequencies of the genes will remain constant from one generation to the next (1) if the population is large, (2) if mating occurs at random, (3) if no mutations occur and (4) if there is no migration of individuals into or out of the population. The operation of the Hardy-Weinberg principle will result in maintaining a given gene frequency in a population. Thus, a population undergoing evolution is one in which the gene pool is changing from generation to generation. The gene pool is the sum total of all the allelic genes in a population and the gene pool of a given population may be changed (1) by mutation, (2) by hybridization, that is the introduction of genes from some outside population or (3) by recombination brought about by crossing over and by the assortment of chromosomes in meiosis may also lead to new combinations of genes and phenotypes with some specific advantage or disadvantage for survival that would be reflected in a change in the gene pool.

All the modern understandings in cytology, genetics, cytogenetics, population genetics, and evolution gave a way for the formulation of a coherent theory called "Modern Synthesis" around 1930s' by S.Wright, H.J.Muller, Th.Dibzhansky, R.B.Goldschmidt, J.S.Huxley, R.A.Fisher, J.B.S. Haldane, Ernst Mayr and G.L.Stebbins.

C. SYNTHETIC THEORY OF EVOLUTION (Neo-Darwinism)

By the beginning of the 20th Century, the essential foundations for evolutionary theory had already been developed. Darwin and Wallace had articulated the key principle of natural selection forty years earlier and the rediscovery of Mendelian genetics contributed the other major component – a mechanism of inheritance. But these two basic concepts did not join rather quickly into a consistent theory of evolution. For the first thirty years of the 20th Century, geneticists emphasized sharp contrasts within particular characteristics of organisms. As such, evolution was seen as a process of fairly large radical "jumps" and this "mutationist" view came to be seen as an alternative to the "selectionist" tradition. A synthesis of these two views was not achieved until the mid 1930s and we owe much of our current view of the evolutionary process to this intellectual development.

- All biologists who explain evolution in

terms of natural selection are called Neo-Darwinians.

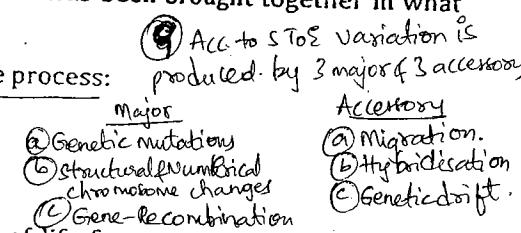
- No factor other than NS is used to explain evolution.

- Such biologists are referred as pure selectionist (Synthetic theorists as Partial selectionist)

- 3) First question - answered by Mutation theory of Hugo de Vries.
- Diff b/w Darwin & Mendel - unit of study - D - population; M - individuals (more focus).
 - ① In 1930s scientists shifted emphasis to population - Mendelian pop common gene pool
 - ④ They developed idea that "evolution is a change in gene freq. in gene pool of a pop over certain time period."
 - ⑤ Through process of NS the freq of advantageous genes increases & they survive to reproduce.
 - ⑥ This is called synthetic theory of E coz the basic concepts of NS-theory, Mendelism, Mutation theory, pop genetics are synthesised.
 - ⑦ This is also called Neo-Darwinism theory & new dimension was given to Darwin's theory.
 - ⑧ SToE brought change in ~~study~~ approach of study of Physical A since middle Anthropology Paper 01 - Volume 01 of 20th century.
 - ⑨ Physical A was Biologists working on models of evolutionary change in the late 1920s and early 1930s came to realize that genetic and selective processes were not opposing themes, but that a comprehensive explanation of organic evolution required both. Small new changes in the genetic material are in fact the fuel for natural selection. The two major foundations of the biological sciences had thus been brought together in what Julian Huxley termed the "The Modern Synthesis".

From the perspective of modern synthesis, evolution is a two stage process:

- (8)
1. Production and redistribution of variation
2. Natural selection acts on this variation



Darwin saw evolution as the gradual unfolding of new varieties of life from previous forms over long periods of time. This depiction is what most of us think of as "evolution" and it is indeed the end result of the evolutionary process. But these long-term effects can only come about by the accumulation of many small evolutionary changes occurring in every generation. In order to understand how the process of evolution works, we must necessarily study these short term events. Today we study evolutionary changes occurring between generations and are able to demonstrate how evolution works. From such a modern genetic perspective, we define evolution as a change in allele frequency from one generation to the next.

Allelic frequencies are numerical indicators of the genetic makeup of a population, the latter being an interbreeding group of individuals. An inherited trait may be of slightly different form in different individuals. We call the variant genes that underlie these different forms of inherited trait, alleles. The different expression of inherited traits is the result of genetic variation within a population. The frequencies for combination of genes represent the proportions of a total and hence allele frequencies refer to only the whole groups of individuals i.e. populations. Individuals do not have allelic frequencies; they have the genes or the combination of these genes. Nor can individuals change alleles. From conception onward, the genetic composition of an individual is fixed. Therefore, an individual cannot evolve; only a group of individuals - a population - can evolve over time.

Evolution is an incredibly common phenomenon and may occur between every generation for every group of organisms in the world, including humans. Over a period of time, the relative proportions of alleles in the population will change, some may increase, and some decrease and still others may remain the same. Over a short run of just a few generations, such changes in inherited traits may be only very small, but if further continued and elaborated, the results can and do produce spectacular kinds of adaptation and whole new varieties of life. Whether we are talking about such short-term effects in one population from one generation to the next, which is sometimes called microevolution or the long-term effects through fossil history, sometimes called macroevolution, the basic evolutionary mechanisms are similar.

Now, how do allelic frequencies change? Or to put it in another way, how does evolution occur? The modern theory of evolution isolates general factors that can produce alterations in allele frequencies. As already stated, evolution is a two stage process. Genetic variation must first be produced and distributed before it can be acted upon by natural selection.

Factors that Produce & Redistribute Variations (Page 99, 134)

1. **Mutations:** An actual alteration in the genetic material is called mutation. A mutation is a change in the base sequence of DNA. For such changes to have evolutionary significance, they must occur in the sex cells, which are passed between generations. Evolution is a change in the allelic frequencies between generations. If mutations do not occur in sex cells, either the egg or the sperm, they will not be passed to the next generation and no evolutionary change can result. If however a genetic change does occur in the sex cells, this change or mutation can change the allelic frequencies in the subsequent generation.

Forces of evolution

Systematic forces

Migration
Mutation
Selection

Dispersive forces

Random Drift
Inbreeding

Somatic
Genetic (Germline)
Point
Gross
Induced
Spontaneous

Anthropology Paper 01 - Volume 01

Geneticists often distinguish between two kinds of mutations, chromosomal aberrations, which may result in alterations in the amount or position of genetic material and point mutations, which are permanent, heritable changes within a gene. Mutations occur frequently in the nature and have been reported in many organisms. In man, mutations cause variation in hair, color, skin pigmentation and several somatic malformations. Usually mutations bring about changes in the genetic structure at the gene level. All those factors which bring about a change above the gene level are termed as chromosomal aberrations. Chromosomal aberrations bring about a change in either the structural aspects of a chromosome or they may bring about a change in the number of chromosomes present in the organism.

✓ Actually, it would be rare to see evolution occurring by mutation alone. Mutation rates for any given trait are quite low, and thus, their effects would rarely be seen in small populations. In larger populations, mutations might be observed but have little impact on shifting allele frequencies. However, when mutation is coupled with natural selection, evolutionary changes are quite possible.

✓ Mutation is the basic creative force in evolution and in fact is the only way to produce "new" variation. Its key role in the production of variation represents the first stage of evolutionary process. Darwin was not aware of the nature of mutation. Only in the last century, with the spectacular development of molecular biology, have the secrets of this phenomenal force have been revealed to evolutionary biologists.

✓ Migration: Migration is the movement of genes from one population to another. If all individuals in a population do not choose their mates from within the group, significant changes in allele frequencies could occur. If a change in the allelic frequency does take place, evolution will have occurred, this time by migration. Migration works both ways – changes in the genetic frequencies will be affected in both the cases of in-migration and out-migration. In humans, social rules, more than any other factor determine mating patterns, and cultural anthropologists must work closely with physical anthropologists in order to isolate and measure this aspect of evolutionary change. Detailed explanation on this factor can be found in the chapter on Population Genetics.

2(b)
Isolation
(pg. 22)

↓
Migration's
but isolated
populations
would bring
greater
variation
within
the species

only (page - 137) - Sewall Wright Studies.
Genetic Drift: The random factor in evolution is called Genetic Drift, and is due primarily to sampling phenomena (i.e., the size of the population). Since evolution occurs in populations, it is directly tied not only to the nature of the initial allele frequencies of the population, but to the size of the group as well. If, in a population of say 100 individuals, two blood type O individuals are killed in an auto accident before completing reproduction, their genes would have been removed from the population. The frequency of the O allele would have been reduced in the next generation, and evolution would have occurred. In this case, with only 100 individuals in the population, the change due to the accident would have altered the O frequency in a noticeable way. If, however, the initial population had been very large (say 10,000 people), then the effect of removing a few individuals will be very small indeed. In fact, in a population of large size, random effects such as traffic accidents would be balanced out by the equal probabilities of such events affecting all the other individuals with different genetic combinations (i.e., different genotypes). As you can see, evolutionary change due to genetic drift is directly and inversely related to population size. To put it simply, the smaller the population, the larger is the effect of genetic drift.

When considering genetic drift, we must remember that the genetic makeup of individuals is in no way related to the chance happenings that affect their lives. When applied to our example, this fact means that the genetic makeup of individuals has absolutely nothing to do with their being involved in automobile accidents. This is what is meant by random event and why this factor is usually called random genetic drift. If, for example, a person had died in an auto accident caused by hereditary poor eyesight, such an event would not be genetic drift. If the individual, because of some such hereditary trait, dies early and produces fewer offspring than other individuals, this is not random genetic drift but natural selection.

✓ Recombination: Since in any sexually reproducing species both parents contribute genes to the offspring, the genetic information is inevitably reshuffled every generation. Such recombination does not in itself change allele frequencies (i.e., cause evolution). However, it does produce the whole array of

Adaptation → functional shift in the allele frequencies

Anthropology Paper 01 - Volume 01

genetic combinations, which natural selection can then act upon. In fact, the reshuffling of chromosomes during meiosis can produce literally trillions of gene combinations, making every human being genetically unique.

The phenomenon and the process in which the genetic combination of the offspring is different from the parental combination is called recombination or genetic recombination. Compared to mutation, recombination has got greatest role to produce variability. Mutation and gene flow or migration can produce variability in a population with respect to single gene. Recombination can combine the novel alleles, which at first are likely to be carried out by different individuals in a single genotype. Furthermore, recombination can multiply the number of different gene types in the population. It converts a small initial stock of multiple gene variation into a much greater amount of genotypic variation.

Adaptation is the attribute of the assembly of beneficial genes rather than a single gene. These assemblies are harmonized in the covers of evolution to suit best in the environment and obviously, such assembly is essential for the evolution. Recombination is the only process which can form such assembly. Sexual reproduction is the chief mechanism of recombination in higher eukaryotes which have high chromosome number, have high gene number, and reproduce sexually. Hence these organisms have maximum recombinant forms. This is the reason why no two individuals are alike, which develop from different zygotes (exception being identical twins which develop from same zygote).

The commencement of evolution is from mutation in the form of multiple gene variation. Later, through recombination the assembly of adaptive gene is over and they are competent enough to be selected i.e., attainment of requisite adaptation. Thus, recombination is the mid point in the process of evolution.

Natural Selection Acts on Variation

The evolutionary factors just discussed – mutation, migration, genetic drift and recombination – interact to produce variation and to distribute genes within and between populations. But there is no long-term direction to any of these factors. What then does enable populations to adapt to changing environments? The answer is, of course, natural selection – the process so well elucidated by Darwin more than 125 years ago. Given that there is genetic variation among individuals within a population, some of these variations may influence reproductive success (number of offspring successfully raised). If, as a result of genetic variation, some individuals contribute more offspring to succeeding generations, this is natural selection. In fact, natural selection is defined as differential net reproductive success.

How then do populations adapt? A result of natural selection is a change in allele frequency relative to specific environmental factors. If environment changes, the selection pressures change as well. Such a functional shift in allele frequencies is what we mean by adaptation. If there are long-term environmental changes in a consistent direction then allele frequencies should also shift gradually each generation. If sustained for many generations, the results may be quite dramatic.

Unit of Selection: Selection acts on individual. It is individuals who reproduce or do not reproduce and who continually attempt to maximize their own reproductive success. Thus, the individual, not the group, is the unit of selection. If the total reproductive success of all members of a population continuously falls below replacement value (where more individuals die than are born in a generation) the population will become extinct. Individuals will attempt to maximize their own reproductive success even in the face of such impending extinction.

Overpopulation is the result of individuals maximizing their reproductive success. Even if such behavior means the whole group will perish, no special evolutionary mechanisms exist to keep individuals from reproducing at their greatest capacity. Of course, humans have the potential to manipulate their numbers, and the entire world now faces the problem of controlling an exploding population. Evolution, therefore, has no built-in mechanism to guard against extinction. Indeed, extinction is actually the rule – not the

Anthropology Paper 01 - Volume 01

exception – in evolution. Of all the species that have ever lived on earth, it is estimated that less than .1% are now currently living; the remaining 99.9% met their almost inevitable evolutionary fate.

4 **The Unit of Evolution:** While selection acts on the individual, changes in allele frequency occur between generations for an entire population; that is, an interbreeding group of organisms. The net result of all individuals' reproductive success (natural selection) – in addition to the possible effects of mutation, migration, and genetic drift – will affect the entire population. The population, then, is the unit of evolution, and it is the population that changes from generation to generation.

5 **Modes of Selection:** Depending upon the environmental change i.e., the rate at which the change occurs like slow change, abrupt change or change in the ecological diversity, the population is thrown to different environments and is hence selected accordingly. This sets particular pattern of selection which is termed as the mode of selection. Basically there are three modes of selection.

1. **Directional Selection:** As environmental pressures change gradually, selection pressures should also shift. If the environmental pressure is directional, selection should also be directional. For example, in the last one million years, there have been long periods of gradual cooling in the earth's climate. One means of coping with cold among mammals has been increase in body size. If we assume animals, such as mammoths, are descendants from smaller ancestors, how did they gradually get bigger? The answer lies in understanding natural selection. Those animals with genotypes for larger overall size perhaps resisted cold better, lived longer, mated more often, cared better for their young, and so forth. In any case, the result was that they reproduced more successfully than other smaller individuals. As the climate continued to grow progressively colder, allele frequencies also continued to shift, and average mammoth size gradually increased.
2. **Stabilizing Selection:** If, on the other hand, environments remain relatively stable, there should be selection for those genotypes already established within an "adaptive plateau". In other words, those phenotypes in the center of the population distribution ("modal" varieties) should have higher reproductive success, and those at either extreme will be selected against, as long as the environment remains stable. If we again choose size as a characteristic, we can note that some varieties of turtles have changed little in millions of years. In any given generation, the environment of turtles has not changed much from that of previous generations. Therefore, the "optimal" phenotype is probably an average-sized turtle, and those much larger or much smaller should be selected against.
3. **Diversifying Selection:** In this type of selection, phenotypic variants at both extremes are favored, and those in the center of the distribution (closer to the mean) are selected against. For example, in the case of baboon size relative to predation pressure, it may be advantageous to be small (less conspicuous) or very large (for active defense). Over time, such selection pressure would act to create a twin-peak (bimodal) phenotypic distribution. In fact, such a process would not have long-term effects in a fully reproductive population, since individuals of all sizes would be mating with each other, thus producing individuals of intermediate body size. In order for the diversifying selection pressures to be maintained, some degree of reproductive isolation between segments of the population would be required. Another possibility is that phenotypic variation can be partitioned and maintained by other genetic differences – sex, for example. In fact, baboons do differ markedly in size, with males averaging about twice the size of females.

Evolution at the Species Level

A species is defined as a group of interbreeding organisms that are reproductively isolated and, therefore, cannot successfully interbreed with other groups (species). The capacity to reproduce is the critical factor in defining species. Theoretically, one can test whether two kinds of organisms are members of different species by observing their reproductive behavior under natural conditions (who mates with whom), and by observing the results (are the offspring fertile?).

Actually, a species is composed of subunits that are breeding communities, which we have already defined as populations. All members of a species can potentially interbreed, and some degree of interbreeding (migration) is theoretically possible between all populations of that species. The net result of all forces of evolution acting on all populations determines the fate of the species as a whole. If sustained over a long period of time, gradual changes in allele frequencies between member populations can eventually lead to sufficient genetic differences, so that fertile reproduction is no longer possible. We then may recognize a new form of life having arisen from one species "splitting" and producing new species, a process called speciation. If on the other hand, total reproductive success is so low that all or even most populations become extinct, the whole species will be doomed and will disappear from the earth forever.

Isolation & Speciation

→ Use concepts of Inbreeding, Genetic drift, Synthetic theory.

According to Mayr, the way new species are first produced involves some form of isolation. Picture a single species of some organism composed of several populations distributed over a wide geographic area. Gene exchange (migration) will be limited if a geographic barrier, such as a river, ocean, or mountain range, separates these populations. This extremely important form of isolating mechanism is called geographic isolation. → leads to Reproductive Isolation

Now, if one population (A) is separated from another population (B) by a mountain range, individual animals of A will not be able to mate with the animals of form B. As time passes (several generations) genetic differences will accumulate in both populations. If group size is small, we can predict that drift will cause allele frequency changes in both population A and population B. Since drift is random in nature, we would not expect the effects to be the same. Thus, the two populations would begin to diverge.

As long as gene exchange is limited, the populations can only become more divergent with time. Moreover, further genetic difference would be expected if the groups are occupying somewhat different habitats. These additional genetic differences would arise through the process of natural selection. Certain individuals in population A may be most reproductively fit in their own environment, but may be less fit in the environment occupied by population B. Consequently, allele frequencies will change, and the pattern will be dissimilar in two populations.

Again, as the time passes, and perhaps as environments change further, the populations will become still more divergent. With the cumulative effects of drift and natural selection acting over many generations, the result will be two populations which could no longer interbreed fertiley. More than just geographic isolation would now apply; there may, for instance, be behavioral differences interfering with courtship,

(2) what we call behavioral isolation. There may even be sufficient differences in body size and proportions to make copulation physiologically impossible, what we call mechanical isolation. Using our biological definition of species, we now would recognize two distinct species where initially only one existed.

(4a) The pre-requisite for speciation is reproductive isolation. Mechanisms that prevent successful reproduction between members of two or more populations (viz., closely related species) that have descended from the same original population are called isolating mechanisms. The significance of isolating mechanisms (i.e., reproductive isolation) in speciation is first of all recognized by the post-Darwinian evolutionist, Dobzhansky in 1937. Since that time a great amount of literature has accumulated about isolating mechanisms.

Most modern evolutionists such as Meacham (1961), Mayr (1948, 1970), Stebbins (1966, 1971), etc., have classified the reproductive isolating mechanisms into two classes namely pre-mating or pre-zygotic mechanisms and post-mating or post-zygotic isolating mechanisms. Both types of isolating mechanisms differ fundamentally with each other in following manner: Pre-mating or pre-zygotic isolating mechanisms prevent wastage of gametes (germ cells) and so are highly susceptible to improvement by natural selection; Post-mating or post-zygotic isolating mechanisms do not prevent wastage of gametes and their improvement by natural selection is indirect (Mayr, 1970). It is further

recognized that for these reproductive isolating mechanisms to evolve, the separated populations of an original single group must be separated spatially or geographically or by time.

- 6 One of the evident functions of isolating mechanisms is to increase the efficiency of mating. Where other closely related species do not occur, courtship signals can "afford" to be general, non-specific, and variable. Where other related species coexist, however non-specificity of signals may lead to wasteful courtship and delays, even where no heterospecific hybridization occurs. Under these circumstances there will be a selective premium on precision and distinctiveness of signals. Moreover, each species is a delicately integrated genetic system that has been selected through many generations to fit into a definite niche in its environment. Hybridization usually leads to a breakdown of this system and results in the production of disharmonious types. It is the function of isolating mechanisms to prevent such a breakdown and to protect the integrity of the genetic system of species. Any attribute of a species that would favor the production of inferior hybrids is not selected, since it results in wastage of gametes. Such selection maintains the efficiency of the isolating mechanisms and indeed helps to perfect them. Isolating mechanisms are among the most important biological properties of species.

BASIC CONCEPTS AND TERMS IN EVOLUTIONARY BIOLOGY

1 CONVERGENCE

In some situations, similarities are not the result of being in a line of descent or of common origin, for some organisms may be alike in living habits and appearance, although of different ancestries. Such similar evolutionary development in different forms is termed Convergence. Convergence refers to the

- (1) development of similar characteristics or adaptations in animals that differ in direct ancestry. The hummingbird and the hummingmoth, for example, have converged in their flying habits as a result of their common search for nectar in flowers as a source of food. Convergence ordinarily applies to one or a few characteristics rather than to the overall makeup. Similarities in the retina, the layer of visual cells in the eyes, of some quite different nocturnal animals are an example. Of the two main types of retinal cells (rods and cones), only rods, which are more sensitive to dim light, are present in some deep-sea fish, bats, some lizards and snakes, and probably guinea pigs, whales and some lemurs. All these animals, however, differ markedly from each other in respect to other characteristics less directly related to their adaptation to low light conditions. It is improbable that any instance of evolutionary convergence has been as dramatic and complete as to hide all traces of the diversity of origins. A number of similarities between (2) tarsier and human skulls once were thought by some to demonstrate that the tarsier, not the great apes, was the closest living relative to humans. This is now known to be a convergence caused by the fact that the tarsier and we have both evolved large orbits for large eyes, along with small noses, as less dependence on the sense of smell was the trend.

2 PARALLELISM ^{evolutionary} development of similar characteristics (or) adaptations in animals of ^{similar} direct common ancestry

- An evolutionary development similar to convergence, but in related forms is parallelism. Parallelism implies a similarity in biological makeup of the ancestral forms, whereas convergence does not. If the common ancestor of two organisms were not very ancient, and if evolution in the descendant lines followed more or less the same course, the term parallelism is used. The term is usually applied to two species of organisms that were similar in origin, and that remained similar as they evolved like having some of the same changes occurring in both of them even after they have separated and evolved into two different species. The Old World and New World Monkeys provide an excellent example of parallelism between groups living today, since they appear to have evolved in parallel from a prosimian ancestor that probably lived at least 35 million years ago.

- (3) The reason for parallelism as well as convergence is the same. The organisms, in order to survive in similar environment, must develop similar biological structures. Parallelism, like convergence, is a matter of adaptation under the control of natural selection. The lack of a tail in gibbons, on the one hand, and the great apes and humans, on the other, is probably a case of parallelism, since their common ancestors

probably had tails that were lost in a parallel fashion in the separate evolutionary lines after they diverged. All the monkeys, however, have tails. The Cercopithecidae, the monkeys most closely related to humans and apes, are quite varied in tail length and those species with similar tail lengths are not the most closely related to each other. The tail is a functionally important member used for balance, and very diverse species of Cercopithecidae (the Colobus monkeys and the vervets, for instance) are both arboreal and have long tails, probably as a parallel evolutionary adaptation to arboreal quadrupedal locomotion. Similarly, the reduction of the tail in the brachiating gibbons and the terrestrial Hominoidea is probably a parallel response to locomotor requirements.

3 HOMOLOGY AND ANALOGY

Another way of looking at some of the same phenomena places emphasis on the structures rather than on the processes by which they evolved. In evolutionary biology the term homology means similarity in origin (implying a common ancestor), homoplasy means similarity in appearance but not in origin, and analogy means similarity in function but not in origin. Thus the wings of different species of birds are homologous as wings, but there is no homology between the wings of a bird and a bat. Wings of bird and bat, considered as wings are merely analogous, but both evolved from parts of the arm, forearm, and hand of four-limbed, five-fingered vertebrates, and as such are homologous as forelimbs (along with seal's fingers and the human upper extremity). The wings of the hummingbird and the hummingmoth, however, are not homologous by any standard (except perhaps as animal appendages); they are analogous as wings.

- ✓ Evaluation of structures in terms of homology, analogy, and homoplasy can be valuable in determining whether apparently similar organisms have evolved in a convergent or parallel manner, and prior knowledge of the evolutionary history of particular species aids in identifying homologous and analogous structures. Independent information is also important in making such assessments, but it should be obvious that parallel evolution following divergence of lines tends to result in homologies, while analogies and homoplasy are likely results of convergent evolution.

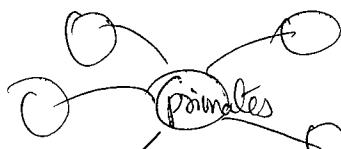
SERIAL HOMOLOGY: Serial homology is the similarity of structures between one part of an animal with another part of the same animal. In this case, two or more structures of a single individual are compared. The arm and leg of man illustrate an instance of serial homology. The humerus bone of the upper arm corresponds to the femur of the leg (thigh). The radius and ulna of the fore arms correspond to the tibia and fibula of the legs (shin). The wrist bones (carpals) may be comparable with ankle bones (tarsal). The bones of the palm of the hand (metacarpals) correspond to the bones of the foot (metatarsals). Finally, the bones of the fingers as well as toes correspond to each other (phalanges). However, the arms of man are suited for grasping and handling, while the legs are used in locomotion.

4 ADAPTIVE RADIATION → defined by Raathna Janusz.

The evolutionary spread and differentiation of the descendants of one type of animal, of whatever level of classification, is called adaptive radiation. Unlike parallelism and convergence, which refer to the ways

- (1) two species of organisms remain similar or become more similar, adaptive radiation refers to the way a particular species evolves into progressively dissimilar organisms. The descendants of a single species sometimes evolve to take advantage of many different environments and opportunities, and rapid changes in the external environment may cause new forms of animals to develop from a single ancestral form. The evolution of a trait that opens up many new possibilities may also give rise to adaptive radiation.

- (2) Adaptive radiation is well exemplified by the history of the mammals. With the geological revolution that marked the end of the Mesozoic era (the age of the reptiles) and the start of the Tertiary, the previously stable climates became more changeable. The dinosaurs did not adapt and so became extinct, while the mammals evolved in many distinct lines. The rodents specialized for gnawing, the carnivores for hunting, the hooved animals for grazing, the primates and sloths took to the trees; the whales, seals, and sea cows adapted for life in the oceans, and the bat took to the air. Furthermore, each of these mammalian orders



Ex: Emergence of Paleocene life forms

Ex: spread of arboreal primates; Old World Monkeys

- Very difficult to reconstruct detailed account of local / regional adaptive radiation.
- However inferences from morphology of fossils and comparative studies of living forms help to some extent.

Anthropology Paper 01 - Volume 01

in turn gave rise to sub lines that colonized new environments by acquiring new modes of life. Many of today's mammals are far different from their primitive common ancestors of the Paleocene epoch.

In addition, various orders and suborders of mammals have undergone further differentiation, branching or "radiating" into types adapted to different habitats. Thus, all the chief groups of primates today include species with contrasting dietary habits. Insect eating, seed eating, leaf eating, and more or less omnivorous genera recurred in different branches of the primates as these branches departed more or less from the ancestral line. This adaptive radiation within the branches is thus accompanied by parallelism between the branches and by convergence of adaptations towards those of some non-primate lines.

DOLLO'S LAW → principle - very imp in studies of primate evolution Ex: Dentition form once lost doesn't reappear in same form

- Louis Dollo, a Belgian paleontologist, in 1893 has published the theory that evolution is irreversible.
- There are no examples of present forms that have developed independently and that are exactly like some ancient prototype. There are, however, examples of the re-evolution of types highly similar in some particular respects to ancient forms. For example, the extinct flying reptiles, the pterosaurs, developed wings but eventually died out. However, wings were re-evolved independently in the birds and bats. A change of the natural environment in an exact step-wise reverse order is exceedingly rare; hence, an occasion for reversed natural selection involving a number of factors in a given order would be just as rare. Furthermore, if a previous allele has been entirely eliminated from the gene pool, a reversal of evolution would also require precisely the "correct" reverse mutation just as the environmental conditions also reverse in proper order. For instance, the implication of a number of biologically absurd "horror" movies notwithstanding, it is difficult to imagine that a nuclear holocaust would leave human survivors exactly like some of the fossils we shall discuss in subsequent chapters.

- Single steps backward, returning to an ancestral condition, sometimes occur in reversed mutations, as has been well documented in bacteria. However, that such reversals will not recapitulate a whole sequence is evidence for Dollo's principle. Evolution is thus irreversible to the extent that true atavisms or throwbacks to earlier forms, do not occur in detail. The cetaceans (whales and dolphins) may have returned to the aquatic environment in which vertebrates first evolved, but they have not once again become fish. They retain air-breathing lungs and numerous other physiological traces of their terrestrial past, and their flippers and streamlined shape are merely analogous to similar structures (fins) and shape in fish. The many different evolutionary details thus prevent a complete reversal of evolution.

Ex: ② Many angiosperms returned to water & assumed alga-like appearances but their morphology is still that of flowering vascular plants.

- MOSAIC EVOLUTION – THE EVOLUTION OF PARTS AND WHOLE
- According to this principle, the evolution of the species tends to be inconstant and asymmetrical. That is, it may be rapid at one time and slow at another. In rare cases it may even virtually stop altogether. At one time, evolution may affect the limbs, and at another it may affect the jaws. With a change in the food supply or some other alteration in the environment, running or biting ability, for example, would become more important or less important in natural selection. This variability in tempo of evolution of different anatomical structures in the same line (that is, in ancestors and descendants) makes it unwise to draw sweeping conclusions concerning the relationship of two fossil forms on the basis of single characteristics. Instead, it is necessary to follow the evolution of whole functional systems. Since the systems themselves sometimes evolve at different rates, one must also take into account the total morphological pattern of the animal insofar as it is preserved. Although all past animals must have been integrated in the same way as existing ones, the interrelationships between functional systems in a single fossil animal are not always self-evident. Knowing the conditions under which it lived may help interpretation, but often the wisest response to a fragmentary fossil is suspended judgment while one searches for additional material. A few observations or measurements evaluated out of context can lead the unwary anthropologist far astray.

- The evolutionary trends of different organ systems like locomotor system, nervous system, respiratory system, and so on, respond separately to environmental conditions. The systems can therefore sometimes

- ② Studies in North American fauna → Earliest fossil primates are tiny; later ones are large.
- ③ This feature common among mammals - Large size enhance ability to avoid predators → enhances reproductive success.
- ④ He extended studies to Eocene ancestors of modern horses which were size of a dog.
- ⑤ This law rule is not universal ex: ferns, herbs.
- ⑥ Progressive size decrease has been characteristic of many vertebrates during Quaternary period.

Anthropology Paper 01 - Volume 01

be studied separately. For example, from studies of comparative anatomy and function it is possible to identify some particularly striking hallmarks of Homo sapiens, such as the bipedal gait and the relatively large and functionally differentiated brain. The evolutionary trends toward these characteristics, as they unfold in the fossil record, are referred to as bipedalization and encephalization, respectively. The evolution of these traits was distinct and separate, with bipedalism apparently preceding encephalization. Nevertheless, the development of a cultural way of life made both advantageous and, in this sense, both are part of the same process of human evolution. The complex mosaic pattern of human evolution led first to the evolution of a manipulative apparatus with hand and eye coordination, then to bipedalization to permit use of the hands even during locomotion, but human encephalization was late and rapid. In each case there is a feedback to the earlier established trend: Encephalization reinforces the bipedalism, and bipedalism permits further evolutionary emphasis on a life niche utilizing exact hand-eye coordination. The evolution of different structures at different rates (but all interacting as parts of an evolving whole) was a source of confusion to evolutionists for many years. It was this sort of confusion, which in part, allowed the Piltdown Hoax to be taken as a "missing link" earlier in the last century. After the recognition that mosaic evolution is the usual pattern, many theoretical and practical problems became easier to resolve, among them the question of missing links.

7 COPE'S RULE (Refer Material)

According to this principle, living organisms have a tendency to increase in their size during the course of organic evolution. This tendency has been found in vertebrates, invertebrates, and plants. To some extent this principle is very similar to Lamarck's proposition that every organism has a tendency to continually increase in size. Though a majority of present species are probably the largest of their respective class, this principle is not universal and has exceptions in both plant and animal kingdoms. Refer to the criticism leveled against the first proposition of Lamarckism for further details.

8 PRINCIPLE OF COMPETITIVE EXCLUSION OR Gause's RULE

In the normal course of evolution, if two organisms occupy the same trophic level in the ecosystem, these organisms try to reach equilibrium through different strategies. Like for example, two organisms may adaptively radiate to occupy different niches in the same trophic level. However, in some cases, it so happens that the very presence of a competitor results in the domination of other organism which tries to adapt very effectively ultimately resulting in the exclusion of the competitor. Such adaptive strategies adopted by the organism to reduce the other to the point of extinction, called Competitive Exclusion, is not seen in these organisms in the absence of a competitor. The famous Russian biologist Gause has conducted experiments in this context on different species of paramecium and explained how effectively each organism causes or simulates a selection pressure on the other.

1.5 CHARACTERISTICS OF PRIMATES

- Further animal experiments ex:- Duckweed

PRIMATES EVOLUTIONARY TRENDS

The problem of defining and characterizing the primates on the basis of anatomical traits is an old one, which has long confronted students of this mammalian group. Not only do living primates lack the distinguishing bodily specializations of other mammalian orders but they also present an amazing variety of forms and grades of organization. The problem is only compounded when fossil forms are considered. Fortunately, the inability to satisfactorily define the primates has not discouraged people from studying them.

The best and most useful solution to the problem of a definition was devised by one of the foremost primate anatomists, Sir Wilfred E. LeGros Clark. After remarking on the general lack of specialization, he proceeds to characterize the order by a series of evolutionary trends. The beauty of this approach is that it not only permits a more accurate definition of the primates but at the same time conveys a wealth of

information about primate evolution, organized in a way that relates numerous anatomical details to a few important generalizations.

Clark's ten evolutionary trends are the following...

1. The preservation of a generalized structure of the limbs with a primitive pentadactyly, and the retention of certain elements of the limb skeleton (such as the clavicle) which tend to be reduced or to disappear in some groups of mammals. (This helped in arboreal adaptations)
2. An enhancement of the free mobility of the digits, especially the thumb and big toe (which are used for grasping purposes).
3. The replacement of sharp compressed claws by flattened nails, associated with the development of highly sensitive tactile pads on the digits.
4. The progressive abbreviation of the snout or muzzle.
5. The elaboration and perfection of the visual apparatus with the development to varying degrees of binocular vision.
6. Reduction of the apparatus of smell.
7. The loss of certain elements of the primitive mammalian dentition, and the preservation of a simple cusp pattern of the molar teeth.
8. Progressive expansion and elaboration of the brain, affecting predominantly the cerebral cortex and its dependencies.
9. Progressive and increasingly efficient development of those gestational processes concerned with the nourishment of the fetus before birth.
10. Prolongation of postnatal life periods.

The first thing to keep in mind is that these are trends rather than characteristics. They are not uniformly present, but are expressed to varying degrees among the members of the order. As a rule, except for the first one, these trends are less well developed in the living prosimians and in fossil forms than in the more advanced, modern Higher Primates.

Though there are ten trends listed, it can be readily seen that they relate to evolution in three principal areas: (a) the limbs and extremities (trends 1-3); (b) the head- eyes, brain and dentition (trends 4-8); and (c) the life cycle-reproduction, growth, and longevity (trends 9 and 10). All of these trends, including number 10, are recognizable to some extent in fossils as well as in living forms. They are all interrelated and adaptive to a mode of life which has been the outstanding factor in primate evolution—the arboreal habitat. Other mammals have taken up arboreal life but none have done it in exactly the same way. Many of man's characteristics are simply refinements of a basic primate pattern that evolved millions of years ago in response to the necessities of arboreal living.

Trend 1 really denotes a lack of change which is in itself remarkable among mammals. The primates have kept the same basic limb structure of their primitive ancestors. There is a single bone in the upper segment of each limb (upper arm and thigh) and paired bones in the lower segment (forearm and leg) with five digit (pentadactyl) extremities. In addition, a clavicle, or collarbone, has been retained in the shoulder girdle. These features contribute to the great mobility of the limbs needed in climbing and grasping. The paired bones in the lower segments of the arm and leg permit some degree of rotation. The five digits are useful in grasping. The collarbone functions to hold the upper limb out to the side of the chest permitting a greater reach and range of movement in a variety of directions. Since the features involved in this trend are skeletal structures, they are observable in fossils where the limb skeleton or parts of it have been preserved.

- Follow Us : nailedupsc.com; Facebook : [nailedupsc](https://www.facebook.com/nailedupsc/); Twitter : [@NailedIt09](https://twitter.com/NailedIt09); Instagram : [nailed_upsc](https://www.instagram.com/nailed_upsc/)
- ① Primates have prehensile limbs adapted for arboreal life
 - ② Either thumb or great toe both are opposable
 - ③ Flat nails upon digits. This makes grasping function of hands & feet easier
 - ④ Well developed clavicle
 - ⑤ Orbita completely surrounded by bony rings & directed forward instead of sideways to serve cliff functions
 - ⑥ At least 3 kinds of teeth - Incisors, canines, premolars
 - ⑦ Two petechial membranes
 - ⑧ Brain always has calcareous tissue & a posterior lobe
 - ⑨ Testes are descended into scrotum
 - ⑩ Pendulous penis
 - ⑪ Canine is well developed
 - ⑫ Stomach is simple
 - ⑬ Femur never has a third trochanter
 - ⑭ Cerebral hemispheres of brain are enlarged
- Trend 2, having to do with prehension or grasping ability, is essential to the primate adaptation of climbing by grasping. Evolutionary advancement along these lines is indicated by the ability to move the digits independently of one another. The most advanced digits in this respect are the thumb and great toe that are not only independent, but opposable in the majority of primates; that is, they diverge in their axis from the other digits and their tips can thus be brought opposite those of the other digits. Opposability is undeveloped in the tree shrew, is not complete in the prosimian, and has been lost in the human foot that has become a weight bearing rather than a grasping organ. The human condition is atypical of primates, most of whom have grasping hands and feet. Naturally, those species in which digits have been reduced or lost also represent exceptions. The structure and functions of the hand and the implications of it will be discussed more fully under locomotory adaptations.

⑤ Greater intelligence
- Brains to body size ratio is George

⑥ Live in social units & are dependent on parents for long periods

Trend 3 involves modifications of the tips of the digits that facilitate finding and maintaining a secure grip in the trees. Nails on the backs of the digits and tactile pads on the opposite surface evolved together, the former providing protection and support for the latter. Nails undoubtedly evolved from claws that became flattened out in the process and lost their deep horny layer. Tree shrews have claws on all ten digits. The aye-ayes and the marmosets have claws on all digits except the great toe. The lemurs, lorises, and tarsiers have nails on all except the second (in the tarsiers, the second and third) toe. This is known as a "toilet claw," which is used for scratching. In primates, the palms and soles are naked of hair, and the skin is padded, covered with ridges, and richly supplied with sweat glands. This combination of features allows for a better grip by creating friction and some suction on the gripping surface of the extremities. In addition, the sensitivity of these surfaces is enhanced by numerous nerve endings so that tactile discrimination is greatly increased. Digital pads are not observable in fossils but the flattened shape of the ends of the digital bones can indicate that a form possessed nails rather than claws.

Trends 4 through 8 involving the head and face are all generally attributable to the change in sensory orientation that goes with arboreal life, notably the emphasis on vision and de-emphasis of olfaction, or the sense of smell. This is accompanied by a change in the overall shape of the skull as well as the soft parts. Thus, there is a general tendency for the facial portions of the skull, particularly the nose and snout area, to become relatively smaller, accompanied by an increase in the size of the area that houses the brain. This trend is observable in any ranked series of living or fossil primate skulls. In living primates, accompanying behavioral trends are observable as well. For example, as a general rule, the Higher Primates will use their eyes and hands to do things that a prosimian would use his snout and teeth for, such as investigating objects, grooming, or communicating with other animals.

The importance of good vision, especially depth perception, to animals that climb and leap about in the trees cannot be overemphasized. Here mistakes in judging distances can be fatal. Trend number 5 is the result of several factors, the most important of which are: (a) the enlargement of the visual areas of the brain, (b) alterations in the structure of the retina and the nerves connecting it with the brain so that vision is more acute in each eye and coordination between the two is improved, and (c) the moving forward of the eyes in the head so that the visual areas of the right and left eye overlap, permitting stereoscopic vision. A bony eye socket develops for protection as the eyes move forward. The latter is observable in fossils through the changing position of the eye sockets in the skull and their gradual enclosure from the side and from behind by bone. In living tree shrews, the eyes are located on the sides of the head, while in the Higher Primates they point directly forward. The lemurs represent an intermediate condition.

Trends 4 and 6 are correlated with the general decrease in the importance of the sense of smell. With it goes (a) a decrease in the size of the olfactory areas of the brain, (b) alteration in the structure of the external nose so that in the tarsiers and the Higher Primates the nose is not covered with a naked, moist membrane for the rapid conduction of odors, and (c) a reduction of the bony snout. As a rule, prosimians use olfactory communication to a greater extent than the Higher Primates. This involves the use of specialized scent glands and "marking" behavior which are universal among the Lower Primates, found also in some South American monkeys, but are relatively rare in Old World Higher Primates.

Anthropology Paper 01 - Volume 01

In the dentition of the primates, evolutionary changes have taken place in both the numbers of teeth that a group possesses and in their form. Like most mammals, primates are both diphodont, having two sets of teeth (deciduous and permanent), and heterodont, having teeth of different shapes which perform different functions (incisors, canines, premolars, and molars). The number of teeth characteristic of a species can be indicated by a dental formula that expresses the number of each kind of tooth in one quarter of the jaw (such as upper right). Primitive mammals had forty-four teeth and a dental formula of 3-1-4-3, or three incisors, one canine, four premolars, and three molars. Primates have undergone a reduction in the number of teeth, which is probably related to the reduction of the face and jaws in general.

This table shows the dental formulae and numbers of teeth characteristic of living primate groups. Here it can be seen that there is quite a bit of variation among the prosimian groups though all have lost at least one incisor and one premolar from the primitive mammalian formulae. The New World monkeys have as many premolar teeth as prosimians, but show an evolutionary tendency for the reduction of the third molar that is small and occasionally absent in many of the cebid monkeys and have disappeared from the dentition of the marmosets. Among the Higher Primates of the Old World, the dental formula is uniformly 2-1-2-3 (thirty-two teeth). There are, however, differences in the structure and arrangement of the teeth, which allow one to distinguish among the dentitions of the Old World monkeys, apes, and man. Just as they show wide variability in their dental formulae, the living prosimians also have variations in tooth form, to some of which represent specialized or aberrant features. The dental peculiarities of the aye-aye, with its dental formula reflecting the emphasis on its large gnawing upper incisors, have already been mentioned and have been shown to be related to its peculiar diet and way of life. The living tree shrews, lemurs, and lorises share an unusual specialization of the incisor teeth known as a "dental comb." The lower front teeth (incisors and sometimes canines) are slanted forward, and the crowns are narrow and closely spaced, forming an apparatus that looks very much like the teeth of a comb, while the upper incisors are reduced. Observations of captive animals indicate that these teeth are primarily used for grooming the fur and rarely in feeding or fighting.

In the Higher Primates the canine teeth are usually large and sharply pointed and stand out beyond the level of the other teeth. This necessitates some modifications in the adjacent teeth so that the large canines can fit in when the mouth closes. In animals with large canines there is usually a gap or diastema, between the upper second incisor and the upper canine for the large lower canine to fit. The crown of the first lower premolar is sectorial (slanted back with a sharp edge) so that the tip of the upper canine fits against it and is sharpened or honed by the grinding that occurs.

Dental Formulae & Number of Teeth in Various Living Primates		
Group	Dental Formula	No. of Permanent Teeth
Lemuridae	2-1-3-3/2-1-3-3	36
Indriidae	2-1-2-3/2-0-2-3	30
Lorisoidea	2-1-3-3/2-1-3-3	36
Tarsiidae	2-1-3-3/1-1-3-3	34
Cebidae	2-1-3-3/2-1-3-3	36
Callithricidae	2-1-3-2/2-1-3-2	32
Cercopithecoidea	2-1-2-3/2-1-2-3	32
Hominoidea	2-1-2-3/2-1-2-3	32

Anthropology Paper 01 - Volume 01

The molar teeth of primates have remained rather simple and unspecialized as far as mammalian molars go. This may be related to the relatively generalized diets that most primates have. The primitive mammalian three-cusped molars have been transformed by the addition of a fourth cusp in the Higher Primates. The structure of the molars in the Cercopithecoidea is highly distinctive with four cusps, two forward and two behind each pair being joined by an enamel ridge. The crown of the tooth is constricted in the middle. This type, known as a bilophodont molar, is a useful distinguishing feature of the fossil and living Old World monkeys and indicates their genetic similarity. Observations of baboons living in East Africa indicate that the value of the bilophodont structure is that the teeth can still function when extremely worn. The modern apes and man usually have either four or five cusped molars with grooves separating the cusps. These grooves may form a Y which when associated with five cusps is called a Y-5 pattern. The Y-5 pattern is found in fossil apes and men and gives evidence of their close phylogenetic relationship.

Teeth are very valuable in the study of phylogeny because they are good genetic indicators and are often preserved in the fossil record. They can also give some clues as to diet and ecology. However, observations from living primates serve to emphasize the fact that all dental evolution is not necessarily related to diet. The dental comb of the prosimians is a good example. The large, sharp canine teeth of the Old World monkeys and apes serve important functions in predator defense and social displays. It is well known that in many human groups teeth are used as tools in such non-dietary activities as tanning hides.

Certainly one of the most significant features of primate evolution is the trend involving expansion and reorganization of the brain and its consequences for behavior. Primates are large-brained animals for their body size. The most important changes have occurred in the cerebral cortex which has progressively expanded in size so that it covers the rest of the brain, and its surface has become folded. While the olfactory area of the cortex has become reduced in the Higher Primates, the visual area and those having to do with coordination of sensory and motor activities, association, and memory have greatly expanded. These changes in the structure of the brain permit (1) more accurate sensory perception, especially visual and tactile, (2) better coordination between sensory stimuli and muscular response, and (3) greater variety of behavioral responses to environmental factors. The first two are obviously advantageous to animals that leap and climb about in the trees. The third is extremely important as an adaptive mechanism, for primates can modify their behavior to meet a wide variety of environmental problems. In a sense, their behavioral flexibility has taken the place of bodily specializations. This trend has been carried farthest in man.

Trends number 9 and 10 are related to primate reproductive patterns that might be said to emphasize quality rather than quantity of offspring. Though mammals have fewer offspring and take better prenatal and postnatal care of them than do reptiles, none have carried this tendency to the extremes seen in the primates. In the placental mammals, the young develop inside the mother's body and take nourishment from her bloodstream by means of a special structure known as the placenta which attaches to the wall of the uterus. After birth the mother continues to nourish her young by means of mammary glands or breasts and to otherwise protect and care for them. Thus, the young continue to be physically dependent on the mother for some time. During this dependency and association with an adult (or adults, if the mother lives in a social group), the young are in a position to learn various forms of behavior which promote their survival. They can also experiment to some extent without their mistakes being fatal, since there will be an adult around to help bail them out of trouble. Learned behavior is advantageous over inborn, or instinctive behavior because it is more flexible and adaptable to a wide range of circumstances. Therefore, it is not surprising that increased intelligence, advanced brains, and better maternal care go together in the mammals and especially in the primates.

As a rule, female primates give birth to one infant at a time. Only the tree shrew has litters and the marmosets and some lemurs regularly have twins and triplets. The advantage of having a single infant may be ultimately due to arborealism and the difficulty of carrying more than one offspring. Rather than leaving them in a nest, most Higher Primate mothers carry their infants, or, more often, the infant clings to the mother's fur while she climbs, swings, leaps, or walks about. While it is usual for the prosimians to

Anthropology Paper 01 - Volume 01

have multiple nipples for nursing their young; the Higher Primates typically have a single pair located on the chest. Since only one infant is usually born at a time, its survival is more critical and features that enhance its chances of survival have evolved. One of these is a more efficient type of placenta that permits a closer contact between the fetal and maternal blood supplies. Going from the Lower to the Higher Primates and from monkeys to apes to man, there is a regular and well-marked trend for a lengthening of the period of growth and development and an accompanying delay of maturation. As a result, there is a longer gestation period, an increasing immaturity of the infant at birth, a longer postnatal growth period, and a later attainment of sexual maturity. The extreme expression of this trend is seen in man whose growth period lasts for about twenty years.

Comparative Data on Growth & Development			
Species	Gestation	Age at sexual maturity	Length of growth period
Rhesus Monkey	5 ½ months	2-3 years	7-8 years
Chimpanzee	7 ½ months	8-9 years	11-12 years
Man	9 months	13-15 years	20-21 years

This Table gives some comparative figures for a cercopithecoid monkey (the rhesus macaque), an ape (the chimpanzee), and man. There is also an apparent increase in longevity that goes with the lengthening of the pre-adult phases of life, but this is difficult to document in wild primates.

The fact that the Higher Primates are helpless and immature at birth and take a long time to reach adulthood means that their learning period is greatly expanded. The delayed maturation also affects reproduction. Not only do female primates usually have only one infant at a time, but their reproductive capacity during a lifetime is relatively low because they reach sexual maturity late. Also, because of the length of gestation and unusually long period of nursing, Higher Primate females do not typically have infants in rapid succession. At the most they can have one infant a year and in many it is less often than that. Thus trends number 9 and 10 both ensure that primates have relatively few infants, but invest considerable time and effort in caring for and raising them. The return on this investment must be great; otherwise such a pattern would not have evolved. In summary, the major prevailing tendencies of primate evolution have been to deemphasize the nose, teeth, and face and to emphasize the hands, eyes, and brain. The limb skeleton remains little changed, and the reproductive system becomes more efficient. It can be seen that man is very similar to the other primates in his basic anatomy, and that most of his differences are simply a matter of degree. This makes it very difficult to define man logically.

PRIMATE TAXONOMY & BEHAVIOR**(Primate Behaviour - Material)**

Taxonomy in its modern use also reflects evolutionary relationships.

RELATIONSHIP OF PRIMATES WITH OTHER MAMMALS

To define our place in nature, we can start with our widest memberships and then consider our more intimate relationships. R. H. Whittaker (1969) reviewed the evolutionary relations of all organisms and proposed a major revision of the traditional system of classification. He noted that bacteria and other one-celled organisms were variously classified and do not "fit" comfortably into either the plant or the animal kingdom. Following Whittaker, it is now customary to classify the bacteria and similar organisms within a kingdom of their own - the Monera - characterized by unicellular organisms which are usually nourished by absorption (an exception being the blue-green algae, which carry on photosynthesis). Another kingdom, Protista, includes most other one-celled forms and a few colonial organisms.

Anthropology Paper 01 - Volume 01

The multi-cellular organisms are differentiated off the basis of nutrition into those dependent on absorption, photosynthesis, and ingestion. This new classification allows the animal kingdom to be defined more precisely as multi cellular organisms that ingest their food. Most animals have also evolved a sensory-neuro-motor complex that makes possible perception of food and movement to acquire it. Complementary to the capacity to ingest food are digestive, circulatory and excretory complexes, the regulation of which requires rapid conduction of information along nerves as well as self-regulating chemical feedback through internal secretions. Whittaker added that the logic of this "has led to high levels of structural and functional complexity among animals and ultimately towards complexity of inherited behavior or toward intelligence". The degree of differentiation exceeds that of all other organisms. We humans are thus animals; we ingest food, move and feel.

A feature of the animal kingdom, which all animals use in some generations, and some (including humans) use in all generations, is bisexual reproduction. That is, reproduction is not simply the production of an image of one parent but the recombination of elements inherited from two parents. Bisexual variation provides for great variability. Only half of the chromosomal material of each parent is involved and it is a chance matter which of each parent's paired genes will be involved in the recombination in the offspring.

Radiation: As the single celled organisms have given rise to multi-celled ones with differentiated tissues, Whittaker divides these in turn, by the three ways they transform food into energy. There are

1. The producers (plants with their photosynthesis)
2. The Reducers (fungi) and
3. The Consumers (animals).

Each of these functions is possible in any setting and so, in turn, there has been a tremendous differentiation through the evolution of variants. This evolution can be depicted as branches of a tree and is therefore cladogenetic.

CHORDATES

The major divisions of a kingdom are called Phyla (singular: Phylum, meaning a clan or tribe). Among the animals, the human species belongs to the phylum of the Chordates. These animals are bilaterally symmetrical, that is, the left and right sides are, for the most part, mirror images of one another. Chordates are also distinguished by having, at some time during their life, a flexible rod called a Notochord along their backs (from the Greek word Noton: The Back). The notochord is a rod of cartilage which serves to stiffen and support the body. Nearly all extant chordates also have a Spinal Chord, but it is the notochord, not the spinal chord, that distinguishes the phylum Chordata.

Of the chordates, the most numerous group shares still other features with humans. This sub-phylum is the Vertebrates and includes the fishes, amphibians, reptiles, birds, and mammals. These forms have a spinal cord with a brain at the head end. The cord and the brain form the central nervous system, which coordinates movements and sensations. In addition, vertebrates have a well-developed vertebral column to surround and protect the spinal cord. They also have an internal skeleton of bone or cartilage that surrounds and protects such organs as the brain and sense organs, and enables the limbs to support and move the body. The vertebrates regularly have locomotor appendages. Except for certain fish, these always consist of two pairs of limbs or, as in snakes and whales, some evidence of descent from animals that had them.

MAMMALS

The subdivisions of phyla are called Classes by biologists. One of these is the mammals (from mammae meaning the breasts). Animals of this distinct class of vertebrates have breasts and suckle their young with milk. Because mammals nourish their young after birth, they establish social relations between

Anthropology Paper 01 - Volume 01

mother and offspring. Social relations are characteristic to various degrees, throughout the class and are also present in various other kinds of animals. Sustained social relationships are especially useful to human mammals for the generation-to-generation transmission of culture through learning.

Mammals are "warm blooded" (endothermic) animals. This means that their body temperature is internally controlled. Mammals can therefore remain active in cold weather. Hair, which is unique to mammals and serves as an insulator, and sweat glands which aid in cooling, are part of the temperature control mechanism. The body temperature of some mammals changes somewhat, but even the bear during hibernation does not undergo a slowing of body processes to the extent characteristic of fishes or reptiles similarly exposed to the cold. Reptiles are ectothermic, i.e., they have temperatures which vary with the outside temperature. Such animals therefore become sluggish in cold weather. In cold environments mammals manage better than reptiles. No crocodiles and few varieties of lizards and snakes are found outside the tropics. The large carnivorous dinosaurs may well have been endothermic.

The mammals share another main feature with the birds. Besides both being warm blooded, in both the young remain dependent for a time on the adults. In addition, birds and mammals share some secondary features, such as efficient body insulation and some systems of communication.

Mammals are also characterized by their differentiated teeth. Reptilian teeth are generally fairly simple in shape, usually looking like sharp cones with no important differences from one part of the mouth to another. (Only the specialized venom-injecting grooved fangs of some snakes are the only exception). In most mammals, however, there are four different kinds of teeth which serve various functions. The front teeth, or incisors, have sharp edges for cutting or biting, and behind them the pointed and often projecting canine teeth serve to grasp prey in some meat-eating mammals or as defensive weapons in others. Further back are the premolars (often called bicuspids in humans, since ours have two cusps or points) and the molars which process the food for swallowing. This may involve grinding, chopping, or shearing in various species. Molar form in mammals is highly variable, with the net result of greater dental adaptability than in reptiles or amphibians in the sense that mammalian species have teeth that are closely related to their particular ecological niche.

The study of ancient mammalian teeth may provide a clue to diet, since tooth form and diet are evidently correlated. Also, similar tooth structure can be informative, since similar structure in spite of the possible range of variation may suggest that two forms share a common ancestor. The mammal-like reptiles of 180 million years ago, from which the mammals presumably evolved have been identified largely on the basis of their differentiated teeth.

Another feature of mammals is that they learn by trial and error. This gives them a very wide behavioral repertoire, including of course, human behavior. Other animals sometimes have developed potentiality for learning. Thus, some birds learn details of their song from trial-and-error repetition of what they hear, whereas other species of bird inherit their characteristic songs. Nevertheless, the mammalian capacity for learning seems unsurpassed in other animals, and mammals depend heavily upon learned behavior. The reproductive mechanism in mammals is marked by economy. That is, higher proportions of the young survive to maturity than in other classes. This reaches its maximum in humans, where a high percentage of offspring conceived are born and a majority of those born survive to adulthood. By contrast, most insects and other invertebrates lay thousands upon thousands of eggs that fail to survive to become reproductive adults. There is a trade-off involved in these very different reproductive strategies, however. Mammals invest a great deal of time and energy in each of their relatively few offspring, whereas invertebrates invest little beyond the production of fertilized eggs. Both reproductive approaches are obviously successful in an evolutionary sense. In mammals the reproductive economy is closely related to the importance of learned behavior, which is enhanced and promoted by continued parent-offspring contact.

SUBCLASSES OF MAMMALS

The class of mammals is divided into three subclasses. These differ from each other primarily in respect to model of reproduction. The first of these subclasses is that of the Monotremes or Prototheria. These primitive mammals, in common with reptiles and birds, lay eggs, but they do have functional mammary glands. The duckbilled platypus and the spiny anteater are only two extant mammals belonging to this subclass. The existence of this subclass suggests that mammals acquired the capacity to suckle their young before any of them substituted live bearing for egg bearing. The ultimate reptilian origin of mammals is also suggested by the fact that the platypus is the only living mammal that is poisonous. Spurs on the hind limbs can inject venom comparable to that of the rattlesnake.

The Marsupials constitute a second subclass (Metatheria) of mammals. This group is somewhat more widespread than the egg-laying mammals and, besides numerous types in Australia, including the kangaroo and the teddy bear koala and also includes the American opossum. The newborn are very immature, however and must find their way to a pouch on the mother's abdomen where they can attach themselves to her nipples. They remain within the pouch until they are adequately developed to re-emerge. The monotremes and marsupials, with the exception of the opossum, have survived only in that part of the world where for geological resources they did not have to compete with more recent and highly evolved mammals. As primitive mammals, they are now threatened with extinction by the introduction of modern placental mammals in their natural habitats.

PLACENTAL MAMMALS

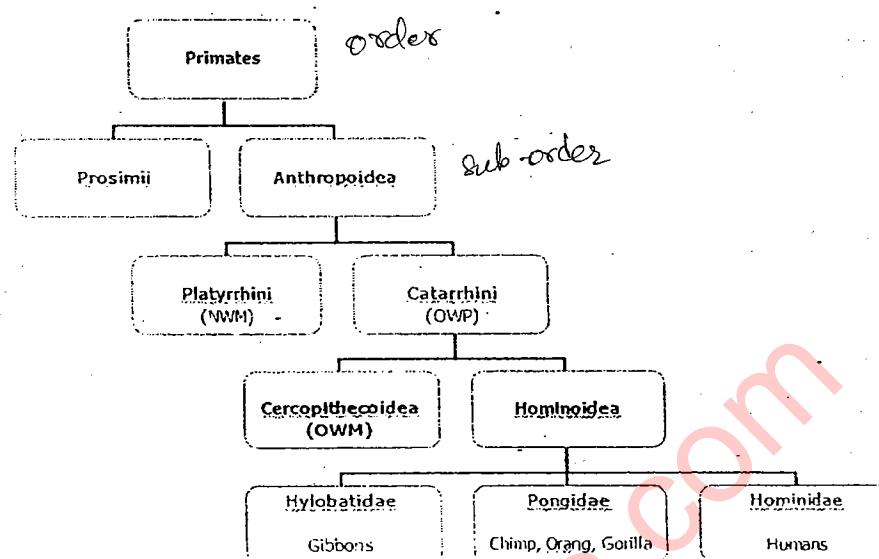
Humans belong to the third subclass, Eutheria or the Placental Mammals. These develop by the special process in which the egg or ovum is shed from the mother's ovary, fertilized internally, and then implants itself in the wall of the mother's womb. Placental mammals use the physiological mechanisms of the adult mother to remove fetal wastes and supply oxygen and nourishment to the developing embryo, whereas the egg of a bird or reptile must contain enough yolk to nourish the embryo until it is hatched and a device for innocuously storing the waste products. The offspring of a placental mammal is protected within its mother's womb until it has grown to a size larger than is usual in egg-laying animals, at the time they hatch. Other animals, including some snakes and fishes, are viviparous and have the capacity to harbor the eggs within the mother's body until ready to hatch, but only in the eutherian mammals is there a placenta capable of sustaining a long intrauterine development and the birth of a relatively large infant. The primates have well developed placentas.

It would be impossible to study or understand the enormous variety of living things and their evolutionary past without some means of organizing them. Scientists have therefore arranged the primates, like all living things, in hierarchical categories called taxa. The organization of taxa or taxonomy that we use today is based on the system invented in 1758 by Linnaeus. He grouped organisms according to their anatomical features. Organisms that shared most or all of their physical features were placed in the same category. The fewer the number of features any two species share, the more likely they are to be placed in different categories.

Taxonomy in its modern use also reflects evolutionary relationships. The system takes into account to some degree the phylogeny, or evolutionary relationships, of the various species. Orangutans, chimpanzees, gorillas, and humans, for instance, are classified together into a single super-family, reflecting the present belief that they diverged rather recently from a common ancestor.

In this classification of primates, we shall progressively isolate the characteristics that define humans. We have already looked at the generalized characteristics that we share with the other primates. Our distinctive human traits will come into focus as we move through increasingly narrow taxonomic categories to Homo sapiens. Along the way, the major taxa into which humans fall will be distinguished from those into which they do not fall.

CLASSIFICATION OF ORDER PRIMATES



DISTINGUISHING PROSIMI FROM ANTHROPOIDEA

Prosimians are the least complex of the primates. They are distinguishable on the basis of certain primitive characteristics thought to have been possessed by the earliest primates. Some of these traits are also found among non-primates, especially those in the order insectivora, which includes shrews, moles, and hedgehogs. In both Prosimians and insectivores, the sense of smell, for instance, is very well developed. This trait is less emphasized in more complex primates in favor of sight. The eyes of Prosimians are placed at the sides of the skull. Because there is a limited overlap in the fields of vision, three-dimensional sight is not fully developed in many species.

In addition to their retention of primitive characteristics, prosimian species also have many specialized characteristics. These characteristics are adaptations that have allowed Prosimians to live in new areas and avoid competition with anthropoid populations. Many, for example, have developed specializations for nocturnal or night time activity. These adaptations (such as huge eyes) have cut down on their competition with diurnal or day-living creatures. Varying patterns of evolution have created prosimians as unlike the tiny frog-like tarsier and the large bear-like indri. The characteristics that distinguish prosimians from the higher primates are:

1. Either of two primitive adaptations to movement in the trees:
 - a. Modifications for clinging to vertical limbs and leaping from tree to tree (as in the tarsiers): long hind limbs, strong hind limb muscles, skeletal arrangement to support a vertical posture;
 - b. Modifications for very slow climbing on all fours (as in the Loris): short limbs, arms almost as long as the legs, mobile hip and ankle joints for hanging, short tail or none at all.
2. Ability of fingers to act in unison; inability to act separately. This arrangement allows powerful grasping, but not manipulation of objects, as in the anthropoids.
3. Claws on some digits instead of nails. These claws are called "toilet claws" because they are used for cleaning dirt and parasites from fur and skin.

Anthropology Paper 01 - Volume 01

4. Primitive arrangement of the pads on the fingertips and toes. These pads aid in clinging to vertical surfaces. In more complex primates, the pads are smaller and little more than thickened skin.
5. Eyes set apart at a greater angle than in anthropoids.
6. Adaptations by some prosimians to nocturnal life. These include enlarged eyes and loss of retinal cones from the eye structure, which respond to bright light and allow color vision.
7. Large, mobile ears which can scan for sound.
8. Well-developed sense of smell. Some have olfactory snouts with bare, moist tips, curved nostrils, and a tethered upper lip, attached in such a way as to allow little facial expression. The sense of smell is less emphasized in the anthropoids.
9. Relatively large olfactory lobes in brain. There is less cortical area than in anthropoids, and ratios of brain size to body weight are smaller.
10. Dental specializations: the upper front teeth, or incisors, are very small and the canine teeth (pointed teeth between the incisors and the grinding teeth) are large. The lower incisors and canines project forward in many species to form a dental comb for grooming the fur.

THE PROSIMIANS

There are three major infra-orders in the prosimian suborder.

1. Tarsiiformes;
2. Lorisiformes
3. Lemuriformes.

Tarsiiformes: The tarsier is the only remaining member of the once large Tarsiiformes infra-order. These tiny creatures, which live in Borneo and the Philippines, are equipped with a very long tail and hind limbs for hopping from branch to branch. Their huge eyes and the pads at the ends of their fingers add to their strange frog like appearance. The special pads help them cling to smooth, vertical surfaces. Tarsiers can walk on a vertical sheet of glass. During the day they sleep clinging to a vertical branch. They wake at dusk and spend the evening hopping from tree to tree looking for insects and lizards to eat.

Lorisiformes: Nocturnal primates, Lorisiformes are divided into two distinct types - lorises and galagos - according to their locomotor patterns. Lorises are found in sub-Saharan Africa and in Asia. They are adapted to slow climbing and creeping. This movement is made possible by a very powerful grasp and strong muscles. Lorises can hang by one hind limb while reaching for food. Insects seem to form the bulk of their diet, but they will eat almost anything from flowers to young birds. Galagos, by contrast, leap gracefully through the trees, taking long kangaroo like hops with their strong hind limbs. Their shorter forelimbs are used to grab hold of branches when they land. They can easily leap from one vertical support to another. Galagos range from the size of large mice to the size of large rabbits. Like the lorises, they are omnivores, that is, that eat both plants and animals.

Lemuriformes: The Lemuriformes, which include lemurs, the indriises, and the aye-ayes, are found primarily on the island of Madagascar, off the southeast coast of Africa. They have developed many variations because of the lack of competition and predators. The members of one genus, the mouse lemurs, are smaller than a mouse and they are the tiniest living primates. The largest members of this infra-order are the indriises, which measure over three feet from head to tail. Most lemuriformes are active during the day and at dusk, but some are nocturnal. Most are completely arboreal, different species living at different levels in the same trees. All lemurs are wonderful acrobats. They can leap great distances, sometimes to the smallest of branches, swinging themselves up gracefully at the end of the jump. Their ability to do so is due not only to their musculature but also to unusually well-developed

binocular vision. Unlike other prosimians, the lemurs avoid animal foods and seem to be highly social. Among other prosimians, only females and infants live together. But the lemurs live in troops of up to 60 members and sleep cuddled in small groups with their tails wrapped around one another.

THE ANTHROPOIDS

The anthropoids are also a diverse suborder. But they are characterized by their own shared set of specialized adaptations. These adaptations mainly allow a more effective use of arboreal environments. Forward-facing eyes permit stereoscopic vision among the anthropoids, and the visual centers of the brain are complex, allowing integration of large amounts of visual data. Depth perception and quick reaction to visual cues are essential to tree-living. Anthropoids also possess color vision, which aids in depth perception and the sighting of brightly colored fruit in trees. Adaptations for grasping and handling objects are crucial to life in trees, as well. Finally, the characteristically high brain-to-body ratio of anthropoids increases their ability to survive by agility and learning. These qualities are more appropriate in the trees than are the specializations of terrestrial animals for attack and defense, such as large horns, tusks, and claws.

DISTINGUISHING PLATYRRHINI FROM CATARRHINI

Within the suborder Anthropoidea, there are two infra-orders: Platyrrhini, the New World monkeys, and Catarrhini, the Old World primates. The most important traits that distinguish these two groups are:

1. Distinctive Locomotory Pattern: New World monkeys usually run along branches on all fours. While feeding at the ends of small branches, they spread their weight between their hands, feet, and tails. Old World primates are more likely to leap from tree to tree, swing by their arms, or walk on the ground.
2. Tails: All New World monkeys have tails, some of which are prehensile. Although some Old World primates have tails, none are prehensile.
3. New World monkeys lack ischial callosities, which are tough pads of skin on the rump that allow the animal to sit on tree limbs for long periods of time.
4. New World monkeys have flat noses with round nostrils and a broad fleshy area between them. Old World forms have nostrils that project and point downward.
5. New World monkeys have a 2.1.3.3. dental pattern (like that of the prosimians). On each side of the jaw there are two incisors, one canine, three premolars, and three molars. Marmosets, an exception, lack the third molar. Old World forms have one less premolar, top and bottom, and hence their dental formula is 2.1.2.3.

THE NEW WORLD MONKEYS:

The New World monkeys live throughout the heavily forested regions of Central and South America. They are divided into two families: the Callithricidae, which include the marmosets and tamarins; and the Cebidae, which contain six subfamilies. Most New World monkeys belong to the family Cebidae.

Most New World monkeys seem to spend their lives in the trees. The woolly titis, for example, lives only in the smallest branches of the highest trees. They do not come down, even for water. Apparently they get enough moisture from the flowers, fruits, and nuts they eat. But the more highly evolved capuchins, which are commonly known as "organ grinder monkeys", sometimes leave the forests to steal fruit and vegetables from farms. Squirrel monkeys too will sometimes come down out of the trees to catch insects.

Locomotor patterns vary among the New World monkeys. Some walk on all fours, both on the ground and on tree limbs. Others, like the spider monkeys, are best at moving in an upright position. They do so by swinging from their arms, which are longer than their legs. Spider monkeys use their strong, prehensile tails to swing and to grasp limbs as they pick fruit. Reportedly, they can jump as far as 30 feet.

Anthropology Paper 01 - Volume 01

We know very little about the social behavior of most New World monkeys because they live in thick jungles, high in the trees, where they cannot be observed easily. They have been seen in troops of up to 30 and in family bands.

OLD WORLD PRIMATES:

Within the Old World line, there are two super families - Cercopithecoidea (or Old World monkeys) and Hominoidea (humans, apes, gibbons, orangutans, chimpanzees, and gorillas). The major differences that have evolved between these two groups are:

1. Most species of Old World monkeys have tails; hominoids have no tails.
2. Old World monkeys are generally smaller than hominoids.
3. Old World monkeys have prenatal development of ischial callosities. Most hominoids are not born with these rump pads, although they may grow after birth.
4. Old World monkeys have a shorter life span than the hominoids.
5. Old World monkeys have smaller brain size to body weight ratios as well as less complex brains than the hominoids. The cerebral cortex is especially well developed in hominoids.

The distinctions here are somewhat more finely drawn than the others we have made. This is because both super families are included in the same infra-order, a sign of their similarity of anatomy. They are more closely related than, say, members of suborders or infra-orders.

The superfamily Cercopithecoidea contains a single family, which can be divided into two subfamilies, the Cercopithecinae and the Colobinae. The most numerous genera in the Cercopithecinae are:

1. The arboreal monkeys of the genus Cercopithecus;
2. The mostly arboreal mangabeys, or Cerocebus; and
3. The terrestrial macaques and baboons, Macaca and Papio.

Langurs are the most common genus in the Colobinae subfamily.

Guenons: The cercopithecine monkeys, or guenons, are widely distributed in Africa. Although they live mostly in trees, some species come down to feed on the forest floor, in plantations, in open bush, and in savanna country. They live largely on insects, fruits and vegetation, but will sometimes eat birds, bird eggs, and even small mammals. They seem to live in small groups made up of a dominant male and small harem of females and their children.

Mangabeys: The long-tailed mangabeys that are sometimes seen with cercopithecines spend much of their day on the ground. Though they possess some adaptations to life in the trees, they also have some of the traits of terrestrial primates. Their hands, for instance, are more like those of the terrestrial baboons than those of totally arboreal primates. They live mostly in the swampy forests of Africa.

Baboons and Macaques: Though classed as separate genera, baboons and macaques are closely related. If they mate, they can sometimes produce fertile offspring. But they inhabit different ranges. The baboons live in Africa and the Arabian Peninsula. The macaques range from India east to Japan. They both live mainly on the ground, though they sleep in trees. Both have developed finely controlled hands with precision grips that function like ours.

Since terrestrial animals are much easier to watch than those that move in the treetops, the social behaviors of baboons and macaques have been studied fairly well. Baboons live in highly structured troops of 10 to 100 members. Within the troop a clear dominance hierarchy reduces tensions and provides protection from predators. The threat-of predators may be the reason for their extreme sexual

dimorphism (different physical forms for the two genders). Male and female arboreal monkeys, who face few predators and rely on their agility for fleeing, look pretty much the same, but among the ground-living baboons, the males are specialized for defense on the ground. They may be twice as big as the females, and they can put on impressive threat displays with their huge canine teeth and their great ruffs of fur at the neck.

Langurs: Among these slender, long-tailed, Asiatic monkeys, group organization is not as important to defense. They often feed on the ground, but prefer graceful flight into the trees rather than an organized show of force. Langurs sometimes live alone and sometimes in troops. In troops, the relationship between males and females is not well defined. The status of females is high when they are paired with a male. But when their infants are born the mothers seem to drop out of the status system altogether. When dominant males are found near temples, they form harems (groups of females) and actually chase away other males.

DISTINGUISHING HUMANS FROM THE APES:

The Apes:

Finally, we shall look at the differences that divide us from the Hylobatidae (gibbons), and our closest relatives, the Pongidae (chimpanzees, gorillas, and orangutans). A list of the anatomical traits distinguishing these two groups from hominids is as follows:

1. Limited bipedal walking: Although pongids and hylobatids are better than any other nonhumans at walking bipedally in a semi-erect posture, they do not do so for long periods of time.
2. Short thumbs: As a result, most of pongids and hylobatids have a limited precision grip.
3. Ridges of bone directly above the eyes: Pongids lack a forehead.
4. Teeth specialized for a diet that includes massive quantities of fruit and vegetation: The canines, used to open fruit and strip plants, are large and projecting. To hold their heavy teeth and support the chewing of such bulky food, pongids have massive jaws that jut forward. A bony simian shelf buttresses the inside of the front part of the jaw. Large cheek bones and in males a ridge of bone called a sagittal crest at the top of the skull anchors the strong chewing muscles
5. Lower brain size-to-body weight ratio than among humans, who have the most complex cortical structure of the hominoids.

GIBBON: It is one of the smallest apes inhabiting South East Asiatic Islands, viz., Java, Sumatra, Borneo, and Philippines. They are also seen in Southern China. There are about 12 varieties of gibbon. The height of the gibbon does not exceed 3 feet and the weight of the adult gibbon ranges from 11 to 15 pounds. There is no sexual dimorphism with regards to the size. The body of these animals is covered with fine wooly hairs, whereas, the hairs of gorilla, chimpanzee and orangutan are coarse. The color of the hair is white, gray and sometimes black or a combination of these three colors.

At times, the gibbon can stand erect. The arms are excessively long in comparison to the length of the leg. It is said that during erect position, the finger tips of the gibbons generally touch the ground. The gibbon can pick up any material from the ground without stooping. Due to their adaptation to arboreal condition, the hands of the gibbons, especially the radius and the ulna (fore arm bones) have elongated enormously. The hand is very long and narrow with a relatively short thumb, which is not perfectly opposable. With the help of the light and slender body, powerful arms provided with long fingers and short thumb, the gibbon can easily travel through the trees with a free swinging and pendulum motion. In length of the leg, as compared to the trunk, the gibbon exceeds all other anthropoids and stands next to man. The foot is elongated and narrow. The great toe will be found far apart from other digits. This wide separation has an advantage in grasping the branches of the tree.

Anthropology Paper 01 - Volume 01

The head is large. The size and general appearances of the skull resemble those of the cercopithecidae group. The brain case is larger in comparison to the face, which is short and provided with a flat and broad nose and thin lips. The forehead is low, and the large and oval eye sockets are composed of thick bony rims. They have large canines and these interlock at the corners of the mouth. The temporal area of the cranium is rough, caused by the attachment of the temporal muscles. The cranial length of the gibbon is 7.5 cm. The cranial capacity varies from 76-90 CC. It is greatly below than that of the higher apes, but higher than those of the monkeys.

The gibbons are gentle and pleasant, and they live in families, which are composed of the parents and the minor children. They can be kept as pets. Their food consists of fruits, leaves, buds, eggs, different kinds of insects and smaller birds. The gibbons possess ischial callosities which is the characteristic of Old world monkeys. In males, the ischial callosities are widely separated in two halves.

The gibbon family can be divided into two groups - Hylobatidae and the Symphalangus. The former includes gibbons proper and the representative of the second group is the Simiang found only in the Sumatra region. The Simiang is larger in size than the gibbon. They have laryngeal air sacs. According to some scientists, the simiangs form the intermediate group between the gibbons and the giant apes.

ORANGUTAN: The orangutans differ very much from the gibbons in their bulky and heavy bodies. They are found mostly in the islands of Borneo and Sumatra. In erect position, the animal is nearly 5 feet high. The weight of the adult males varies from 165 to 200 pounds. The females are somewhat higher. The body of orangutan is covered with long, coarse hairs, of reddish brown color. No hair is found on the face, ears, palm and the soles. The chest is barrel like. The breasts are laterally situated near the armpits. The arms are long and narrow with elongated fingers. The thumb is small and all the digits have flat nails. The forearm is much longer than the upper arms. The legs are short and the foot is long and narrow. The great toe is opposable and very small.

① The head is large with a high and rounded forehead. The brain case is small in relation to the large head. ② The orbits are elliptical in shape. ③ The average cranial capacity is 416 cc. ④ The nasal bones are small and the bridge is not elevated. ⑤ The root of the nose is very narrow. ⑥ The jaw of orangutan is extremely large and projects forward. ⑦ The jaws are provided with long and tusk like canines which interlock.

The orangutans are arboreal in nature. They live on trees by building nests on the branches. They walk on all fours when they come to the ground. The whole body of orang is built in such a manner that it can enjoy the arboreal life to a lesser degree than the gibbon, but to a higher degree than the two other apes. The food of the orangutan consists of fruits, different varieties of leaves, insects etc. The orangutan is represented by a single species.

CHIMPANZEE: The body of the chimpanzee is not so well built as in the case of the orangutan and the gorilla. The chimps are found in large numbers in the tropical forests of Africa. There are three species of chimpanzees - the common chimpanzee, the black-faced, bald-headed chimpanzee and the pygmy chimpanzee. The body proportion of chimpanzee shows some tendency towards that of man. The average height of the full grown common chimpanzee is 5 feet. The weight of the adult male and female are 110 and 88 pounds respectively.

The body is covered with loose and coarse hairs of various colors. There are no hairs on the face, hands and feet. The heads of the bald-headed chimpanzees are devoid of hairs. Most species of the chimpanzees have round low vaulted heads. The average cranial capacity is 400 cc. There is a poor development of the supra orbital ridge and it is continuous. The nasal bones are very small, the bridge is not elevated and the tip of the nose is not like that of the man. In chimpanzee, the forward projection of the jaw is clearly seen. ④ The canines are large and projecting but are smaller in comparison to that of the orangutans and the gorilla. The lips are thin. ⑤ The general appearance of the skull is oval; the facial region is small in proportion to the skull. ⑥ The orbits are elliptical but not so as we find in the case of the orangutans.

Anthropology Paper 01 - Volume 01

The hand of the chimpanzee is elongated and narrow. The fingers are long and the thumb is small and opposable. The legs are long and these are larger than those of the orangutan. The foot is long. The hind limbs of this animal are poorly adapted for walking upright. The great toe is opposable and it is not in line with the other toes. The heel is rudimentary and in erect position the hands of the chimpanzee generally reach up to the knee level.

The chimpanzees are experts in climbing and brachiating. They build nests on the trees and sleep there during the night. Their food consists of fruits, different vegetable products, eggs, small birds and sometimes rodents.

✓ **GORILLA:** Among all the primates, the gorilla is the largest and the stoutest. They are found in equatorial regions of Africa. The gorillas are represented by two species - the Western Coastal or lowland gorilla and the eastern or mountain gorilla. The former inhabit mainly the regions of Cameroons while the latter is found in the region of the Eastern Congo, west of Lake Edward and Lake Kivu.

When the animal stands erect, the hands go below the knee joint. The height ranges from 5 feet to 6 feet in the lowland gorillas and 5 feet 3 and a half inches to 5 feet 11 inches in the mountain gorillas. The weights of the body of adult males range from 350 to 600 pounds.

The body is covered with long and black colored hairs. The face, palms and soles are completely devoid of hair. The massive skull of the gorilla is a note worthy feature. Above the eye openings, an enormous supra orbital goes from left to right side of the skull. The forehead is very low. The general appearance of the skull is more or less oval and there is a prominent sagittal crest. It is weaker in females. The average cranial capacities of the males and females are 550 cc and 450 cc respectively. The big cranium consists of solid bones and there is little space for the brain. The facial portion is larger in proportion to the cranial part. The jaws are large and projected forward and downwards. The upper jaw is prognathus and the lower jaw is massive. The size of the canines is enormous and they interlock. The nasal bones are long, low and narrow; the bridge is slightly elevated. Nostrils are broad and forwardly directed and these are covered by cartilaginous rings mostly like nasal wings but not so developed as we find in man. The lips are thin and chin is completely absent.

✓ The gorilla is more human in different features than in other anthropoid apes. The upper arms are longer than the forearms and therefore it is different from gibbon, orangutan and the chimpanzees. The hand is shorter and broader than in other apes and the thumb is well developed. On the whole, the hand of the gorilla resembles more that of man than any other ape.

✓ The leg is short. The foot of the gorilla also resembles that of man in many respects. The thumb is opposable and it is set apart from the other digits. The heel is more or less well developed. The anatomy of foot of the gorilla speaks that it is less adapted for arboreal prehension. The gorillas spend most of their time on the ground. They climb on the trees also, build their nests and pass the nights there. Sometimes, they can walk erect but their usual gait is obliquely quadrupedal.

Difference between the mountain gorilla and the lowland gorilla: The mountain gorilla differs from the lowland gorilla in the following characteristics - narrow skull, longer trunk, larger face, shorter limbs, shorter and broader hands, body covered by thick and black colored hairs etc.

MODERN MAN: The *Homo sapiens* have spread and multiplied over the whole world within the past 70,000 years. All the living varieties of mankind stem from a common background. But as they settled in different environmental conditions, they acquired distinctive traits. On the whole, man possesses certain unique characteristics, which have helped him to surpass all other animals and thereby establish a new genus *Homo*.

- (1) The relative lightness of the bones is one of the unique features of the mankind. The skull is a large bony case situated at the anterior of the vertebral column. The skull consists of two parts - the cranium and the face. The former is a large and hollow bony case in which the brain is placed. The brain is complex and

(3)

all its parts are relatively enlarged. In size it is from two and a half to three times large as that of the gorilla. The height of the face is short and it is nearly at a right angle to the base of the skull. In man the snout is vanished and the sense of smell is diminished. But, the power of the sight is increased. Our vision is stereoscopic. The orbit is more or less rectangular. The forehead is bulging and the supra orbital ridges have diminished. The nose is prominent and it is raised out of the plain of the face. The nasal bones are short, wide and fused. The fleshy tip of the nose is made of osteo-cartilaginous frame work. The lips are out-rolled and the mucus membranes are visible. The upper lip is provided with a median furrow and is the unique characteristic of man. The nature of the teeth has undergone a great change because of the change in the diet. They are adapted for dealing with a wide range of food. The canines are diminished in size and they do not extend beyond the level of other teeth. In general, all the teeth have become relatively small and closely held together. The molars have been modified to a great extent for grinding. The dental arcade is parabolic in shape. The chin is well developed. In man, the unique characteristic about the skull is that it is well balanced. The spinal cord enters into the foramen magnum of the skull which is situated centrally at the base of the skull. The average cranial capacity of man ranges from 1300 to 1450 cc.

The adaptability of man is seen greatly in the remarkable nature of the limbs. The arms are shorter than the legs. This has resulted due to the bi-pedal locomotion. It is believed by the scientists that our ape ancestors developed the ground living habit when a vast jungle area became treeless due to a climatic change. Walking erect requires an enlargement of the legs. The ridges for muscle attachments on the bone are much more defined than as we find in the apes. The foot has also changed. The great toe is not opposable. Innermost digit is the most dominant one. The metatarsals are bound together by powerful transverse ligament. The lateral toes are reduced, the fifth becoming a rudiment. Humans possess a well developed heel, and the legs are strictly used for walking.

(12) The pelvis is bowl shaped and the transverse diameter is greater than antero-posterior diameter. The sacrum becomes short and broad. The vertebral column has four curves while in the apes only two of such curves are seen.

(13) Man's body is more or less hairless compared to the other apes. The unique characteristic of man is that there is no tactile hair on his body. The upright position, the bipedal locomotion, complex brain, hairlessness, excellent eye sight, power of speech - all these factors have jointly given man a better place in the animal kingdom and thereby he establishes a new genus Homo sapiens.

TERTIARY AND QUATERNARY FOSSIL PRIMATES

The Geological Time Scale during Cenozoic

Tertiary
Quaternary

EPOCH	APPROXIMATE BEGINNING (MYA)
Pleistocene	1.8
Pliocene	5
Miocene	22.5
Oligocene	37
Eocene	53
Paleocene	65

Ardipithecus
Propliopithecus
Aegyptopithecus
Adapidae
Omomyidae
Plesiopithecus

EARLIEST PRIMATES

The first radiation of the primate order has its roots in the beginning of the explosive adaptive radiation of placental mammals in general. Therefore, it is not surprising that the earliest suggestions of primates in the fossil record are difficult to discern from early members of other placental mammal groups, particularly the insectivores.

The earliest discovered traces suggesting the beginnings of our order came from the late Cretaceous and early Paleocene in the Dakota area of North America. Known from several teeth and jaw specimens, this fossil form, called Purgatorius, exhibits the primate tendency towards a bulbous cusp pattern in the molar teeth compared to the sharper cusps seen in insectivores. Such a dental pattern apparently indicates that early primates were adapting to fruit and leaf-eating diets, or perhaps a diet also including insects exploited in an arboreal niche. Reconstructions indicate that the dental formula is still that of a generalized primitive mammal: 3-1-4-3. All that can be said now of this still fragmentary and mysterious animal, Purgatorius, is that if it was a primate, it was quite "primitive", which is not surprising considering its early date and still close ties with primitive placental mammals.

PALEOCENE PRIMATES (65 my – 53 my)

During the Paleocene, the first clearly recognizable primates begin to diversify. In fact, these forms are extremely diverse, with as many as 6 families and numbering more than 25 genera and 75 species. One of the most widely distributed and best represented of these early primates is Plesiadapis, found in both North America and Europe. First known from the late Paleocene, the time range of Plesiadapis extends up into the early Eocene. This animal, known from several skulls plus several parts of the limb skeleton, has an estimated size range varying widely between that of a squirrel and a house cat. While these animals show definite primate tendencies, such as dependence on vision (though not completely binocular) and flexible wrists and ankles (though still probably with claws), they retain numerous primitive characteristics, such as lack of a postorbital bar, which serves to form a bony division between the orbit and the braincase. In addition, Plesiadapis and the majority of other Paleocene primates display unusual (compared to modern primates) specializations of their front teeth, which are large and procumbent (angled forward) and also show other dental oddities.

- ✓ Given these dental specializations, the possibility that any of the Paleocene forms thus far discovered are direct ancestors of later primates seems unlikely. This poses no insurmountable theoretical problem, for we must keep in mind that our meager discoveries represent only a tiny sample of the already diverse kinds of primates living at this time. The overall anatomical plan of all these early forms could be described as prosimian or even "proto prosimian", for they are certainly more primitive than any living primate. In fact, they are more similar in evolutionary grade to the living tree shrews, which give a fairly good model of some Paleocene primates. We must note, however, that Paleocene forms are highly diverse, numbering more than twice as many as the living prosimians.

EARLY PRIMATE EVOLUTION

The distribution and the eventual fate of early primate forms is understandable only within the context of the environments in which these animals lived. First and foremost, we must remember that 60 mya land masses were not arranged as they are today. The continents have drifted to their present position, carried along on the shifting plates of the earth's surface.

In the late Mesozoic, the huge conglomerate land mass called Pangea began to break up into northern and southern continents. To the north, North America, Europe, and Asia were joined into Laurasia; to the south, Africa, South America, Australia, India and Antarctica formed Gondwanaland. Throughout the Mesozoic, the two basic land masses continued to move, with Gondwanaland breaking up into the southern continents. In the north, the continents also were separating, but North America and Europe continued to be connected through Greenland and would remain close to each other for several millions of years. North America and Europe remained in close proximity until mid Eocene, i.e., around 45 mya.

Anthropology Paper 01 - Volume 01

What makes all this geological activity relevant to primate studies is that land-living animals could cross over land bridges, but were effectively cut off by water barriers. Thus, we see species of *Plesiadapis* in both North America and Europe. As far as primates go, then, from their earliest beginnings (65 mya) up until 40 mya they were mostly limited to North America and Europe. With further continental movements, the "New World" and "Old World" became completely separated and thereby influenced the evolutionary histories of primates still living today.

As the continents moved, climatic conditions changed dramatically. In the Mesozoic and into the Paleocene, the continental masses were clustered closer to the equator, and as Laurasia in particular moved north, its climate cooled. Moreover, the fragmenting of the land masses and the consequent altering of marine flow patterns (less exchange between northern and southern seas) caused the climate to cool even further.

Finally, these climatic shifts also heavily affected plant communities. Rather than the primitive, mostly tropical flora characteristic of the Mesozoic (ferns, cycads etc), what we see emerging in the Cenozoic is the rapid radiation of the seed plants (including flowering plants, grasses etc). Indeed, many of these plants are frequently pollinated by insects. As insects thus became more abundant, so did the animals who fed on them – including early primates. The world was never to be the same again. Clearly then, it is extremely important to interpret primate evolution within the context of the earth's changing environments.

EOCENE PRIMATES (53 my – 37 my)

The first primates of modern aspect appear during the Eocene. These can now clearly be called prosimians and closely resemble the Loris/lemur evolutionary grade. Primate diversification accelerates during this epoch, with 4 new families and more than 60 genera represented during this 16 million year span of the Eocene.

The Eocene may be characterized as the heyday of prosimians, who attained their widest geographic distribution and broadest adaptive radiation during this period. Indeed, almost four times as many genera are found in the Eocene than are known for the whole world today (16 living genera, with 10 of these confined to Madagascar).

- ① The most diversified and best-known Eocene primates are members of the lemur-like *Adapidae*, which includes some 10 genera. The four best known of these are:

<i>Cantius</i>	North America and Europe
<i>Adapis</i>	Europe
<i>Notharctus</i>	North America
<i>Smilodectes</i>	North America

Some of these animals have been known from fossil evidence for a remarkably long time. In fact, the initial discovery of *Adapis* was made in France in 1821 and first described by Cuvier himself.

As mentioned, all these animals are fairly lemur-like in general adaptive level and show distinctive primate tendencies not seen in the Paleocene forms. For example, they all now have a complete postorbital bar, larger, rounder braincases, nails instead of claws, and the eyes are rotated forward, allowing overlapping fields of perception and thus binocular vision. In the limb skeleton, further developments in prehensility are suggested, and some evidence points to the presence of an opposable large toe. In all these respects, we see the typical primate adaptive strategies allowing exploitation of an arboreal environment. Whereas these forms resemble lemurs in overall anatomical plan, they do not show the same specializations seen in contemporary lorises and lemurs, such as development of dental comb – projecting lower incisors and canines forming a structure used for grooming and hence called dental comb.

The separate evolution of the Malagasy lemurs may date to late Eocene times, but since this island was already isolated by a deep channel from mainland Africa, they apparently reached their island sanctuary by unintentionally floating over drifting debris. The other major group of Eocene prosimians is the family Omomyidae, known from numerous specimens of jaws and teeth. Omomyids are the most widely distributed of known Eocene prosimians, with discoveries in North Africa and Europe, and a few specimens from Asia as well.

(2) The earlier members of the family are somewhat more generalized than the later ones and may form an ancestral basis for all later anthropoids, New World monkeys, Old World Monkeys, Apes and hominids. Additionally, some of the omomyids from the late Eocene of Europe have been suggested as closely related to the tarsier. However, many of the similarities noted are apparently superficial ones, not necessarily indicating any unique relationship. Nevertheless, at least one feature, the position of the olfactory bulb, links these Eocene forms with later haplorthines. ((The suborder that includes lemurs and lorises is termed Strepsirhini (moist nosed), while tarsier, monkeys, apes, and humans are included within another suborder, the Haplorthini (hairy-nosed)). Also of interest is the fact that, when we enter later epochs, there are forms quite clearly sharing tarsier-like affinities, from the Oligocene of Egypt and from the Miocene in Thailand.

NEW WORLD MONKEYS

The center of action for primate evolution after the close of the Eocene is confined largely to the Old World, for only on the continents of Africa and Eurasia can we trace the evolutionary development of apes and hominids. However, the New World, while geographically separated from the Old World, was not completely devoid of anthropoid stock, for there the ceboids evolved in their own right.

Any discussion of ceboid evolution and its relation to Old World anthropoid developments must consider crucial geological events, particularly continental drift. In the late Eocene and early Oligocene, South America was an island continent separate from North America and Africa.

In such geological context, the introduction of monkeys in South America poses a certain problem. Some authorities have postulated that because the open water distance between South America and Africa was still not very great, monkeys, originating in Africa, could then have rafted to the New World.

In any case, that Old and New World primates share any evolutionary history since at least the early Oligocene (37-35 mya) is unlikely. There is no trace of any ancestor of our lineage anywhere in the New World following this time until fully modern *Homo sapiens* walked into the New World during the late Pleistocene.

While primate fossils abound in the Western Hemisphere during the early Cenozoic, the record is extremely sparse later on. For the entire span of Oligocene to late Pleistocene, we have only a few bits and pieces, a jaw fragment from Bolivia, a nearly complete skull from Texas, several specimens from southern Argentina, and a few other small fragments from Colombia and Jamaica. Together, all the evidence comprises barely a dozen individuals. Thus, tracing the evolutionary heritage of New World monkeys with any degree of certainty is a difficult task.

OLD WORLD ANTHROPOIDS (end of Oligocene)

It is apparent that during this epoch a great deal of evolutionary action was taking place; by the end of Oligocene, Old World Monkeys and hominoids were probably evolving along their separate evolutionary pathways. No doubt, diverse species of anthropoids were adapting to varied ecological niches in Africa and probably Asia and Europe as well. Unfortunately, the fossil record for the entire period is limited to only one locality in Egypt, 60 miles southwest of Cairo. This site, called the Fayum, is today an extremely arid region 100 miles inland, but, in Oligocene times, it was located close to the Mediterranean shore and was traversed by meandering streams crisscrossing through areas of tropical rain forest. The extremely rich fossil-bearing beds were laid down during the early Oligocene, between 37 and 31 mya.

Anthropology Paper 01 - Volume 01

Much of the Fayum fossil material is quite fragmentary. Consequently, evolutionary interpretations are not as unambiguous as we would like. Given the nature of the material, the classification of the fossils into recognized genera and species is somewhat disputed. The leading researcher of the Fayum fossil primates, E.L. Simons of Duke University has recognized seven different genera from the Fayum, six anthropoids and one prosimian. In addition, the new tarsier-like fossil previously mentioned would add yet another form to this impressive tally. Altogether, an estimated 1,000 specimens have been recovered from the remarkably productive Fayum area. The three best known of these genera are discussed below.

1 **Apidium (Two Species):** A well known 30 million year old fossil animal from the Fayum is *Apidium*, represented by about 80 jaws or partial dentitions and over 100 postcranial elements. This animal, about the size of a squirrel, had several anthropoid features, but also shows quite unusual aspects in its teeth. *Apidium's* dental formula is 2-1-3-3 which, as you can easily see, reveals an extra premolar not found in any contemporary Old World anthropoid. For that matter, extremely, few fossil anthropoids in the Old World have this extra premolar. Some researchers suggest, therefore, that this genus and its close relatives (together called the parapithecids) may lie near or even before the divergence of Old and New World anthropoids. As noted, *Apidium* is represented by a large array of specimens, both dental and from the limb skeleton. The teeth suggest a diet composed of fruits and perhaps some seeds. In addition, preserved remains of the limbs indicate that this creature was a small arboreal quadruped, adept at leaping and springing.

2 **Propliopithecus (Two Species):** Among the first fossils found at the Fayum, an incomplete *Propliopithecus* mandible was recovered in 1907. Unfortunately, since detailed geological and paleontological methods were not yet developed, the precise geological position of this form is not known.

Morphologically, this fossil is a quite generalized Old World anthropoid, displaying a 2-1-2-3 dental formula. In every relevant respect, this early *Propliopithecus* form is quite primitive, not showing particular derived tendencies in any direction. Both species appear small to medium in size (8 to 13 pounds) and were most likely fruit-eaters. To date only this one specimen represents this *Propliopithecus (haeckeli)* species.

The second *Propliopithecus* species is considerably better known, with several new specimens discovered at the Fayum between 1977 and 1979. Geologically, this species (*P. chirobates*) comes from the upper beds and is, therefore, probably later in time than the isolated *haeckeli* specimen. Consequently, it is not surprising that *chirobates* is more derived in several anatomical features. Still, this form is a remarkably primitive Old World anthropoid. Considerably more evolutionary change would be required to transform this animal into anything distinctively recognizable as either an ape or a monkey.

Earlier interpretations of fragmentary remains of this fossil suggested affinities with gibbons. However, more complete recent discoveries have shown that such an evolutionary relationship is not likely.

3 **Aegyptopithecus:** The most complete and probably evolutionarily most significant fossil from the Fayum is *Aegyptopithecus* which is known from several well preserved crania of different aged individuals as well as numerous jaw fragments and several limb bones. The largest of the Fayum anthropoids, *Aegyptopithecus* is roughly the size of a modern howler monkey, 13 to 18 pounds. *Aegyptopithecus* is important because, better than any other fossil, it bridges the gap between the Eocene prosimians on the one hand and the Miocene hominoids on the other.

With a dental formula of 2-1-2-3, *Aegyptopithecus* shows the familiar Old World anthropoid pattern. Even more primitive than the teeth of this specimen, is the skull, which is small and resembles the skull of a monkey in some detail. Brain size and relative proportions can be reconstructed from internal casts of the crania thus far discovered. It appears that the brain was somewhat intermediate between that of prosimians and anthropoids. The visual cortex was large compared to prosimians, with concomitant reduction of the olfactory bulbs, but the frontal lobes were not especially expanded. Even considering the relative small size of this animal, the brain – estimated at only 40 cc – was by no means large.

Anthropology Paper 01 - Volume 01

Evidence from the limb skeleton also revealed nothing particularly distinctive. From analysis of limb proportions and muscle insertions, primatologist John Fleagle has concluded that Aegyptopithecus was short-limbed, heavily muscled, slow-moving, arboreal quadruped.

Further detailed study of Aegyptopithecus anatomy has even allowed primatologists to speculate about the social behavior of this ancient primate. For instance dental remains from different individuals vary greatly in canine size. This fact implies male/female differences (sexual dimorphism), were apparently quite marked. Comparisons with living primates further suggest that males may have been competing for females and that the mating pattern was probably polygynous.

All in all, Aegyptopithecus presents somewhat of a paleontological enigma. In most respects, it is quite primitive as an Old World anthropoid and could thus be potentially an ancestor for both Old World monkeys and hominoids. There are some slight yet suggestive clues in the teeth that have led some researchers to already place Aegyptopithecus on the hominoid line. Other researchers are not convinced primarily because of its primitive characteristics.

MIOCENE (22.5 my – 5 my) – HOMINOIDS GALORE

If the Eocene was the age of prosimians and the Oligocene the time of great diversity for early anthropoids, the Miocene was certainly the epoch of hominoids.

A great abundance of hominoid fossil material has been found in the Old World from the time period 22-7 my. The remarkable evolutionary success represented by this adaptive radiation is shown in the geographic range already established for hominoids during this period. Miocene hominoid fossils have been discovered in France, Austria, Spain, Czechoslovakia, Greece, Hungary, China, India, Pakistan, Turkey, Saudi Arabia, Egypt, Uganda, and Kenya. While several intriguing discoveries potentially relating to gibbon evolution have been discovered at Miocene sites, the vast majority of this hominoid material relates to large-bodied forms. Unless we state otherwise, all further discussion of Miocene hominoids refers only to large-bodied varieties.

Interpretations of this vast array of fossil material (now including more than 500 individuals, and perhaps as many as 1,000) were greatly complicated for several decades due to inadequate appreciation of the range of biological variation that a single genus or species could represent. As a result, the taxonomic naming of the various fossil finds became a terrible muddle, with close to 30 genera and over 100 species proposed. The biological implications of such taxonomic enthusiasm were unfortunately not seriously considered. In such an atmosphere, it was possible for two genera to be named one with only upper jaws represented, the other with only lower jaws, and each matching the other!

It is not difficult to understand why such confusion arose if we consider that discoveries of these fossils spanned more than 100 years (the earliest find came from France in 1856) and took place on three continents. Not until the early 1960s did scientists systematically study all the material, the result being a considerable simplification of the earlier confusion. As a result of this research, E. L. Simons and David Pilbeam "lumped" the vast majority of Miocene forms into only two genera: one presumably quite "pongid like" and the other "hominid like." In just the last few years, however, a tremendous amount of new data has come to light from both new field discoveries and finds in museum collections of previously unrecognized material. Consequently, it is now apparent that the Simons-Pilbeam simplification went too far. Hominoid evolutionary radiation during the Miocene produced a whole array of diverse organisms, many of which have no living descendants (and thus no clear analogy among living higher primates).

As these new discoveries are analyzed, many of the perplexing problems concerning Miocene hominoids should be solved. For the moment, it is possible to make only general interpretive statements regarding Miocene hominoid adaptive patterns.

PALEOGEOGRAPHY AND MIOCENE HOMINOID EVOLUTION

As they were to early primate evolution, the factors of changing geography and climates (at work as well in the Miocene) are also crucial to interpretations of the later stages of primate evolution. The Oligocene revealed a proliferation of early Old World anthropoid forms from one area in North Africa. In the Early Miocene, the evidence is also restricted to Africa, with fossils coming from rich sites in the eastern part of the continent (Kenya and Uganda). It would thus appear on the basis of current evidence that hominoids originated in Africa and experienced a successful adaptive radiation there before dispersing to other parts of the Old World.

The hominoids would maintain this exclusive African foothold for some time. The earliest of these East African hominoid fossils is more than 20 mya, and later fossil finds extend the time range up to at least 14 mya. For most of this period, East Africa is thought to have been more heavily forested, with much less woodlands and grasslands (savannas) than exist today (Pickford, 1983).

As in the earlier Cenozoic, the shifting of the earth's plates during the Miocene played a vital role in primate evolution. Before about 16 mya, Africa was cut off from Eurasia; consequently, once hominoids had originated there in the Early Miocene, they were isolated. However, around 16 mya the African plate "docked" with Eurasia (Bernor, 1983) through the Arabian Peninsula, a contact that was to revolutionize mammalian faunas of the later Miocene. Many forms, such as proboscideans, giraffoids, and pigs that originated in Africa now migrated into Eurasia. Apparently, among these mid-Miocene intercontinental pioneers were some hominoids. Since they had evolved in the mainly tropical setting of equatorial Africa, most of the earlier hominoids probably remained primarily arboreal. Accordingly, it has been suggested that a relatively continuous forest would have been necessary across the Afro-Arabian-Eurasian land bridge.

Ecological changes were, however, already afoot in Africa. By 16 mya, the environment was getting drier with less tropical rainforest and, conversely, more open woodland/bush-land and savanna areas emerging. In other words, the environments in East Africa were being transformed more into their contemporary form. With the opportunities thus presented, some African hominoids were almost certainly radiating into these more open niches about 16 to 17 mya. Part of this adaptation probably involved exploitation of different foods and more ground-living than practiced by the arboreal ancestors of these hominoids. Some partly terrestrial, more woodland or mosaic environment adapted hominoids were probably on the scene and fully capable of migrating into Eurasia, even through areas that were not continuously forested.

The environments throughout the Old World were, of course, to alter even more. Later in the Miocene, some of these environmental shifts would further influence hominoid evolution and may have played a part in the origin of our particular evolutionary lineage, the hominids.

EAST AFRICAN FORMS (23-14 mya)

A wealth of early hominoid fossils has come from the deep and rich stratigraphic layers of Kenya and Uganda. These diverse forms are presently classified within at least 2 separate families, including perhaps 9 different genera. Indeed, important and mostly new finds (from the 1980s) have been uncovered, suggesting as many as 3 further hominoid genera in an as-yet-undetermined (and possibly a third) family. In other words, over the 9-million-year period for which we have evidence, as many as 12 different hominoid genera have been sampled from East Africa, with the potential for yet more as the fossil sample accumulates.

Most of the newer material has yet to be described completely, and relationships among specimens are uncertain. The best samples and thus best-known forms are those of the genus *Proconsul* (belonging to the proconsulid family). From this full array of proconsulid remains (mostly dental pieces), considerable variation is apparent. Body size estimates range from that of a small monkey (about 10 lb), to as large as a female gorilla (about 150 lb). Environmental niches were probably also quite varied, for some species

Anthropology Paper 01 - Volume 01

were apparently confined to dense rainforests, while others potentially exploited more open woodlands. Some researchers have also suggested considerable diversity of locomotory behaviors, including perhaps some forms that were at least partly terrestrial. Indeed, when on the ground, some of these proconsulids may even have occasionally adopted a bipedal stance.

The dentition of all the proconsulid forms is, however, quite uniform, showing the typical Old World anthropoid pattern of 2-1-2-3. Moreover, these forms all display broad upper central incisors and large sexually dimorphic canines. In the molars, the enamel is fairly thick (i.e., high cusps), but the softer dentine below penetrates well into these cusps, so that the enamel wore through fairly quickly with use. We can get some idea of diet from these teeth, which suggest that most forms were probably fruit-eaters.

From those well-preserved pieces of crania (representing currently only one species), brain size estimates are at least as large or larger than contemporary Old World monkeys (although probably not as large as contemporary hominoids; note, however, that relative brain size compared to body size is the crucial feature-a tricky estimate indeed for incomplete fossilized fragments). The surface features of the brain do not apparently show the derived characteristics of living large-bodied hominoids, and, in fact, show many primitive hominoid features similar to that seen in gibbon brains.

A full understanding of the evolutionary relationships of the East African hominoids has not yet been attained. Indeed, in many cases, the classification still remains a muddle. For example, one fossil (discovered in the 1950s) from Rusinga Island in Kenya has been renamed and reassigned to different evolutionary groups at least six times. Just as paleoanthropologists begin to think that the situation is becoming better defined; new fossil discoveries muddy the waters still further. Some of this new material may date as early as 18-17 mya, but most of it is in the range 16-14 mya. Thus, for the most part, these finds are later than the proconsulids just discussed. It is not so surprising, then, to find that *Proconsul* is a more primitive hominoid. In fact, many primate evolutionists would place *Proconsul* before the split of small- and large-bodied hominoids. Therefore, while *Proconsul* may not actually have been the last common ancestor of gibbons as well as all large-bodied hominoids (including us), something resembling it may well have been.

EUROPEAN FORMS (13-11 mya)

Although they are the first of the Miocene hominoids to have been discovered, the European varieties still remain enigmatic. Very few fossils have been discovered, and what has been found consists almost entirely of jaws and lower dentitions. Among the only features that distinguish this varied lot of specimens from France, Spain, Austria (and maybe Hungary, too) is that the molar teeth are thinly enameled (i.e., the dentine penetrates far into the cusps). Most researchers would place all these forms into the genus *Dryopithecus*.

Discovery of similar forms from the Rudabanya Mountains in Hungary during the 1970s have complicated matters further. Initially thought to be similar to the thick-enamelled varieties from southern and southwestern Asia (see below), the Hungarian fossils are now placed closer to *Dryopithecus* from Western Europe. Nevertheless, many researchers still believe the Rudabanya fossils are probably a distinct genus (*Rudapithecus*) (Kelly and Pilbeam, 1986). It seems unlikely that these *Dryopithecus*-group fossils are related closely to any living hominoid.

SOUTH/SOUTHWEST ASIAN FORMS (? 16- 7 mya)

Three sites from Turkey have yielded fragmentary fossil hominoid remains dating to the early Middle Miocene (16-14 mya). As we noted earlier, following "docking" of the Arabian plate with East Africa about 16 mya, land routes became available for animal migration from Africa into Eurasia. It would thus seem, from these Turkish remains, that hominoids quickly took advantage of this route and reached Eurasia by 16 mya. Most researchers would assign these remains to the genus *Sivapithecus*.

Anthropology Paper 01 - Volume 01

Far more complete samples of *Sivapithecus* have been recovered from southern Asia, in the Siwalik Hills of India and Pakistan. Most dramatically, over the last 15 years, paleoanthropologists led by David Pilbeam of Harvard University have recovered numerous excellent specimens from the Potwar Plateau of Pakistan. Included in this superb Pakistani collection is a multitude of mandibles (15 in all, some of which are nearly intact), many postcranial remains, and a partial cranium, including most of the face.

Sivapithecus from Turkey and Pakistan was probably a good-sized hominoid, ranging in size from 70-150 lb. It probably inhabited a mostly arboreal niche, and its locomotion was "apelike," at least in the sense that *Sivapithecus* most likely displayed some suspensory abilities. *Sivapithecus* differs morphologically from *Proconsul* or *Dryopithecus* in its dentition and facial anatomy. The front teeth, especially the upper central incisors are often quite large, while the canine is fairly good-sized (low-crowned and robust). There are, however, large discrepancies in canine size among *Sivapithecus* individuals, partly because some species were larger overall, but also because there was considerable variation (sexual dimorphism) within the same species. In diet, like most other hominoids, *Sivapithecus* was probably a fruit-eater.

The first lower premolar is also quite variable in shape. Usually it is fairly sectorial in shape; that is, it shows the shearing surface typical of most catarrhines (consequently, this is probably the primitive condition). The most distinctive aspect of *Sivapithecus* dentition is seen in the back tooth row, where molars are large, flatwearing, and thick-enamelled (with dentine not penetrating far into cusps).

The thickness of the enamel cap has played a significant role in recent interpretations of Miocene hominoid evolution. Among living hominoids, relative to body size, humans have by far the thickest enamel caps. Gorillas and chimps have thin enamel, but orangs could be described as moderately thick. Thick, in fact very thick, enamel is also seen in early hominids (in the time period 4-1 mya). As we have seen in *Proconsul* and *Dryopithecus*, their enamel thickness itself varies, but dentine usually penetrates into the cusps, so that the enamel wears through during use.

Probably, the most characteristic anatomical aspects of *Sivapithecus* are seen in the face, especially the area immediately below the nose. Facial remains of *Sivapithecus* from Pakistan and Turkey have concave profiles and projecting incisors (and, overall, remarkably resemble the modern orang). In particular, the partial cranium discovered in 1980 at the Potwar Plateau (Pakistan, circa 8 mya) and published two years later (Pilbeam, 1982) bears striking similarities to the orangutan. The published description of this specimen had a tremendous impact on paleoanthropology. The biochemical evidence demonstrates the distinctiveness of the orang from the African apes and humans; here, then, was fossil evidence suggesting some ancient Asian traces of the orang lineage. As a result, the views of biochemists and paleoanthropologists agree more closely.

It must be noted however that, except for the face and jaw, *Sivapithecus* is not like an orangutan. In fact, especially in the post-cranium (i.e., all skeletal parts except the head) *Sivapithecus* is distinctively unlike an orang, or any other known hominoid, for that matter.

Many earlier fossil-based interpretations of Miocene evolutionary affinities had, of course, to be reevaluated. As we hinted at the beginning of our discussion of Miocene hominoids, in the 1960s E. L. Simons and David Pilbeam suggested a Middle Miocene hominoid as the first hominid. According to this view, this early hominid was "*Ramapithecus*" known at that time mostly from India, with some bits from East Africa.

- As a consequence of these new discoveries, the earlier suggestion that "*Ramapithecus*" was a definite hominid was seriously questioned and has now been rejected altogether. One primary advocate of this revised view is David Pilbeam (1977; 1982; 1986), an initial architect of the earlier widely accepted theory. Pilbeam, who has led the highly successful paleoanthropological project at the Potwar Plateau, has been swayed by the new fossils recovered there and elsewhere. These more complete specimens are dentally very similar to what had been called "*Ramapithecus*." Researchers now simply lump "*Ramapithecus*" with *Sivapithecus*.

In summary, then, the fossil remains of *Sivapithecus* from Turkey and India - Pakistan are the most clearly derived large-bodied hominoids we have from the whole Miocene. While some forms (e.g., *Proconsul*) are seemingly quite primitive and others (*Dryopithecus*) are derived in directions quite unlike any living form, *Sivapithecus* has several derived features of the face, linking it evolutionarily with the orang. The separation of the Asian large-bodied hominoid line from the African stock (leading ultimately to gorillas, chimps, and humans) thus occurred at least 12 mya.

OTHER MIocene HOMINOIDs

- (4) **Pliopithecus:** Another interesting but still not well-understood hominoid is *Pliopithecus*, from the Middle and Late Miocene of Europe. Since this is a fairly small hominoid (estimated at 11-16 lb), for several years primatologists suggested *Pliopithecus* was a gibbon ancestor. Moreover, dental features were also thought to mirror gibbon morphology. However, these similarities are superficial at best. In those respects in which *Pliopithecus* resembles contemporary small-bodied hominoids, the features are all primitive for hominoids in general. In fact, for most relevant anatomical details, *Pliopithecus* is a remarkably primitive hominoid (in fact, at least as primitive as *Proconsul*). This is surprising, given its relatively late date and Eurasian distribution (where hominoids are generally more derived than their African cousins). It may be that *Pliopithecus* is a long-surviving descendant of an Early Miocene, very primitive ancestor, one that antedated the radiation of major hominoid lineages.
- (5) **Greece ("Ouranopithecus," 12-11 mya):** From the Ravin de la Pluie near Salonika, Greece, have come several hominoid specimens (mostly mandibles, but also a partial face) discovered in the 1970s. Because the molar teeth have thick enamel, researchers initially grouped these finds with *Sivapithecus*. However, recent analysis of the critical facial anatomy has shown that the Greek finds are not similar to *Sivapithecus* (or the orang), but their molar morphology also makes them unlike *Dryopithecus*. The evolutionary relationships of this Greek hominoid thus still remain a mystery.
- (6) **Lufeng, Yunnan Province, Southern China (8-7 mya):** The recent discoveries from the Lufeng site in southern China have been remarkable, now totaling over 1,000 specimens (including several crania, mostly crushed mandibles, and hundreds of isolated teeth). Since the fossil collection is so large, and since the crania are in need of much restoration, most of the material has yet to be fully described. Therefore, conclusions regarding this most important fossil collection must remain highly tentative. Indeed, there is still argument concerning how many genera are represented among the Lufeng hominoids, with some experts favoring two, while others see only one genus. Ongoing interpretation of the vast dental remains has led some researchers to suggest that only one species may be represented. If so, this would be an extremely variable species, most likely reflecting extreme sexual dimorphism. In fact, such a degree of sexual dimorphism (at least dentally) would exceed that seen even in the modern orang (i.e., males more than twice the size of females). Like the Greek fossils discussed in the preceding section, the evolutionary relationships of the Chinese specimens are unclear. They also do not show the shared derived features of the *Sivapithecus*-orang lineage. Determining exactly where they fit thus remains a major challenge for primate evolutionists.

A COMPARATIVE ANATOMY OF MAN AND APES

(pg-54)

Darwin's declaration regarding the descent of man from non-human ancestors caused a great deal of controversy among the scientists and the general public of those times. It was a matter of a great degradation when any attempt was made to draw any line of relation between the apes and man. However, in the due course, with newer inventions and discoveries in this line, Darwin's view was accepted by all and thereby the people are forced to embrace their strange relatives.

Apes and men are the members of families Pongidae, Hylobatidae and Hominidae. They belong to the suborder Anthropoidea and the order Primates. The relationship of apes and man will be understood if attempts are made to study the various anatomical features critically.

- (1) Cranial capacity
- (2) skull - frontal region
- (3) supra-orbital ridges
- (4) Foramen magnum
- (5) Forehead
- (6) Face - flat
- (7) Jaw size
- (8) Nose
- (9) Eye orbits
- (10) Teeth size
- (11) Chin diastema dental arch

- (12) Legs
- (13) Arms upper limbs
- (14) Lower limbs
- (15) Linea aspera
- (16) Foot Great toe
- (17) Vertebral column
- (18) Brain weight

Anthropology Paper 01 - Volume 01

- The skulls present many contrasting features which should be studied with care. The skull of man is highly developed in the frontal region. The forehead extends almost vertically in the upward direction. ✓ The supra-orbital ridge is not so developed and it may be feeble, trace or moderately developed. No sagittal crest is present in the skull. The maxilla and the pre-maxilla have been fused. The foramen magnum is situated at the center of the skull. The head is well balanced and hence the face is perfectly vertical. The line of muscle attachments are less developed on the back side of the skull. In apes, the forehead is less developed and the head slopes backwards. The supra orbital is highly developed and prominent. A sagittal crest is present in the skull. The foramen magnum is seen further backward at the base of the skull. It is for this reason that the ape's face hangs downwards. The line of muscle attachment is seen high up in the backward part of the skull.

The lower jaw of man is small in size in comparison to those of the apes. The muscle responsible for the movement of the lower jaw is weak. In man, there is always a well developed chin. Man's facial portion never projects forward but the prognathism of the lower jaw is sometimes noticed, though very rare. Ape's lower jaw is massive and there is no trace of chin. The muscles for the movement of the lower jaw are strong and well developed. Facial prognathism is very common among the apes.

Teeth in man are smaller in size than those of the apes. The canines do not project forward beyond the level of the other teeth. The chewing motion in man is from side to side and also up and down - generally known as the rotary motion. The dental arch, in the case of man, takes the shape of a parabola, whereas, in apes, it is U-shaped. In apes, the sizes of the teeth are large and the canines project beyond the level of the other teeth. Due to this nature, the canines of the apes interlock when the jaws are closed. This arrangement prevents the lateral movement in chewing. The chewing motion in ape is only up and down. With the shortening of the canines, man has developed a new rotary motion.

The nose in the primates is composed of two parallel bony plates, united by a suture in the middle line. From these nasal bones extend the cartilaginous nose which is divided into two separate chambers - the nostrils - by the septum. In man, the nose is well developed. The root and the bridge of the nose have a slightly marked elevation and the cartilaginous portion is seen well above the surface of the nose. The tip of the nose in man has a thick bulb that overhangs the septum. The nasal wings are strongly developed, but they do not grow under the long axis of the nose to form the lower borders of the nostrils as is found in the case of the gorilla. The nostrils are smaller and they generally point downward. The elevation at the root and bridge in ape's nose is very little or absent. The cartilaginous portion of the nose is very wide, unlike man, and it is little raised on the surface of the face. The tip of the nose is lacking in the apes and this is why the nostrils have become prominent and look like large holes.

The lips of the apes are seen stretched over their bulging jaws and they are loose and protrusive. The ape's lips are thin as the red portion of the lip is scarcely seen when the mouth is closed. The integumental lip has little quantity of fat. In man, the integumental upper lip shows a median furrow which starts from the nasal septum and continues upto the edge of the membranous lip. This median furrow is the characteristic feature of man. The lips vary from thin to very thick.

In apes, the arms are greatly elongated, an adaptation to the habit of hanging and walking in the branches. This type of locomotion by arm of the apes is called brachiation. In apes, the upper arms acts as movable levers and hence the length is short and in man the fore arm is movable lever and has hence shortened.

The femur (thigh bone) of ape is short, thick and curved. In man it is long, slender and elongated. Due to this, the ape walks with a shambling gait. The ridges for muscle development in femur are greatly developed in man than in the apes. The linea aspera - a rough ridge on the back side of the femur is characteristic to man. It has resulted due to the great development of the extensor muscles which play a most important part in the erect posture of man and the bipedal gait. Owing to the great development of the ridge, the cross section of the human femur gives a prismatic form, while in apes it is round and oval.

The foot of man has witnessed a remarkable change due to its new mode of locomotion. The foot supports the weight of the body and helps in standing and walking erect. In apes, the foot is used for both

locomotion and for the grasping of branches on the trees. The great toe in man is non opposable. It lies in the same line with other digits. The lateral toes are reduced in size and the fifth one is rudimentary. But in the case of the apes, the great toe is opposable and it is not in line with the other digits. The lateral toes are well developed in apes. Unlike the ape, man's foot is arched antero-posteriorly.

As regards to the stature and weights, the apes vary. The gibbon is the smallest among the apes and its average height and weight are three feet and fourteen pounds respectively. The orangutan attains an average height of four feet six inches and the average weight of about 165 pounds. The chimpanzees and the gorillas are considered as the tallest among the apes. Their average heights are five feet and five and a half feet respectively and their average weights are 100 and 350 pounds respectively. The average height of man is five feet six inches and the average weight is 145 pounds. The vertebral column of man possesses four curves which help in supporting and transmitting the weight of the head and trunk in erect posture. In apes, the vertebral column has two such curves.

In brain development, man shows more advancement than the apes. The brain in man is not only much larger than that of the apes but it is highly developed. The weight of man's brain is three times as heavy as that of the gorilla, the largest ape. The frontal region of human brain is especially developed and the cerebral cortex presents a much more complex convolutional development than that of the apes. But it should be kept in mind that the structural difference is totally one of degree. The brain case in man is the largest ranging from 1300 to 1450 cc. The average cranial capacities of the gorilla, chimpanzee, orangutan and the gibbon are 549, 400, 416 and 98 cc respectively.

Man is distinguished from the apes mainly by his power of articulating speech. But there are some scientists who have felt that the use of some sort of language among the apes. According to G. L. Garner, the vocal language of the monkeys and apes differs only in its complexity and degree from that of man.

We have seen the differences and the similarities in the characteristics of man and apes. According to Huxley, "whatever system of organs be studied, the comparison of their modification in the ape series leads to one and the same result - that the structural differences which separate man from the gorilla and the chimpanzee are not so great as those which separate the gorilla from the lower apes". He concludes that in the sum total of classificatory differences, the apes are like men. Recent studies about the physiological characteristics of the uterus and placenta of apes revealed a lot of similarities with those of the human beings. The physiological sexual rhythm in the female chimpanzees is similar to that of human females. Even the serological studies point to a close relationship between apes and man. Even many diseases of humans like typhoid, cholera and syphilis can be transmitted to the apes.

ANATOMICAL SIMILARITIES AND DISSIMILARITIES BETWEEN MAN AND APES

Gorilla and Man: In hands, feet, and pelvis and in size of brain, the gorilla shows close relationship with man. But the massive jaws of the gorillas have no resemblance with those of man.

Chimpanzee and Man: The chimpanzee and man relate to each other to a great extent by means of the likeness of the skull and the pigmentation of the body. The chest proportion of chimpanzee is mostly human.

Canines interlock

Orangutan and Man: In his high forehead and the same number of pair of ribs, the orang demands a closer relationship with man, than all other apes. On the other hand, the two factors like the shortness and degenerate character of the legs and the adoption of the feet for suspension, separate these two individuals from each other.

Gibbon and Man: The length of legs and the erect gait of the gibbon indicate its closer relationship with man, anatomically. But in other characters like excessive arm lengths, general size, pelvis, hands and feet, length of canine teeth and the size of the brain, the gibbon goes farthest from the man.

It is very difficult to identify the man's closest relative among the four apes. This is especially true when all the physiological, anatomical, morphological, anthropometric and genetic characters are considered.

Anthropology Paper 01 - Volume 01

Among the four apes, it is seen that each of them develops one or more special features, with which it can demand the closest relationship with man.

PRIMATE ADAPTATIONS - ARBOREAL AND TERRESTRIAL

One of the major contributions of the study of living primates is in the area of functional anatomy. The evolutionary importance of anatomical characters and complexes cannot be fully understood by studying skeletons or dissecting specimens. Studies of structure must be supplemented by observation of the behavior of living primates who are in the process of using their anatomy in various ways.

Two functional complexes that have received great deal of attention in primates are the hand and the locomotor apparatus. The two are not fundamentally different since all primates, except man, use their hands in locomotion to some extent. The reason for emphasizing on locomotion is the fact that man's full time, bipedal, upright locomotion, which has played such a crucial role in his evolution, is unique among the primates and its origins unclear from the fossil record. Thus, primatologists and anthropologists began to look at the locomotor systems of other primates in an attempt to discover what might have led to the human pattern.

LOCOMOTORY ADAPTATIONS

It is probable that the primitive mammalian ancestor of the primates was a small, essentially quadrupedal and arboreal animal who scurried along the tops of branches and climbed by digging its claws into the bark. From this pattern several different forms of locomotion have evolved. There is a naked trend toward upright posture in the primates which overlies the various forms of locomotion and can be considered a primate characteristic. Thus, the upright posture of man is not unique but is simply a part of this general trend.

The essential factors in upright posture are the reorientation of the body with respect to gravity and this necessitates many skeletal, muscular and visceral changes. Among these are the modifications in the proportions and balance of the skull, with the face or muzzle being reduced and the skull being set directly on top of the vertebral column. A good indicator of the degree of uprightness in fossil skulls is the position of the foramen magnum, the large hole in the base of the skull where the spinal cord joins the brain. In quadrupeds like the dog, the foramen magnum is located at the very back of the skull and there is a large muzzle in the front. With uprightness foramen magnum moves forward, and the face is reduced so that the skull nicely balances on centre of its base. Humans require little muscle action to hold their heads erect because of this balance; animals like gorilla with heavy muzzles require heavy neck muscles to hold them up.

	<u>Apes</u>	<u>Man</u>
<u>Skull</u>		
<u>location -</u>	more posteriorly placed	Balanced on spinal column
<u>Nuchal Muscles</u>	Heavy	Almost disappeared
<u>foramen magnum location</u>	Towards rear of centred base of skull	Exactly at Centre
<u>zygittal crest</u>	Present	Absent
<u>cranial capacity</u>	GI - FEG 98 O - 325 416 Gir - 400 550 C - 4010	1300 - 1450
<u>Forehead</u>	Sloping Receding	Vertical

G.S. Kartic (karticsg@gmail.com)

	<u>Apes</u>	<u>Man</u>
<u>Face</u>		
<u>Angle -</u>	Bognathism	Alveolar Prognathism (6°) Orthognathism
<u>Orbits</u>	Relatively smaller (elliptical)	Relatively larger (Rectangular) close together
<u>Frontal bone</u>	less developed	Highly dev due to dev of brain
<u>ramusilla</u>	Visible & well marked	Absent due to fusion
<u>Zygomatic</u>	well dev due to high mastication	moderately developed
<u>Note</u>	→ depressed & broader → Not dev Nasal root - Not distinct	prominent & elongated prominent & high P 11 "distinct"
<u>Nasal wings</u>	Don't hang over	cover nostril hence not visible from

Group	Hand Movement	Thumb	Grasping Patterns
Tupaioidea	Convergence and divergence only	Non-opposable	Use two-handed prehension, whole-hand control
Lemuroidea Lorisoidae Tarsioidae	Convergence and prehension	Pseudo-opposable	Use a single grip pattern for power and precision, whole-hand control
Ceboidea	Convergence and prehension	Pseudo-opposable	Some separation of precision and power grips, but precision grip different from Cercopithecoid-Hominoid type. Little evidence of independent finger control.
Cercopithecoidea	Convergence and prehension	Truly opposable	Use separate power and precision grips. Have separate control of the thumb and, in some species, separate control of the index finger as well.
Homoidea	Convergence and prehension	Truly opposable	Use separate power and precision grips. Have separate control of all fingers.

With regard to the locomotion, several basic types have been defined and these are presented in the table enclosed. It should be pointed out that locomotor behavior and anatomical structure do not always coincide. For example, the anatomy and skeletal proportions of the chimp and gorilla would lead us to classify them as brachiatorms, yet neither uses brachiation to any great extent. Behaviorally, they are quadrupeds; but their anatomy and hand posture are unlike those of other quadrupedal primates. Thus, some animals are difficult to classify in any simple manner. Also, it should be remembered that classification is based on the most typical form of locomotion used, and that animals in the natural habitat always use a variety of locomotor patterns.

Apes		Man	
Jaws	Dev at expense of brain	Brain dev. at expense of jaws	
Mandible size	Large & massive	slender & light	
Chin	No	Yes	
Carnites	Well developed, projecting above others	Moderate size, same height of other teeth	
Dicentema	Present	Absent	
Canine Interlock	Yes	No	
Dental Arch	'U' shape	Parabolic	
Teeth size	Larger	Smaller	

A CLASSIFICATION OF PRIMATE LOCOMOTOR PATTERNS

CATEGORY	SUB TYPE	ACTIVITIES	PRIMATE GROUPS
QUADRUPEDALISM	ARBOREAL	Leaping using hindlimbs for propulsion and clinging to vertical support	Glagos, some lemurs, indris, tarsiers
		① Slow climbing Slow climbing by grasping firmly with hands and feet	Loris, potto
		② Branch running, and walking Walking and running along tops of branches; climbing and leaping also seen	Tree shrews, some lemurs, aye-ayes, marmosets, some cebid monkeys, guenons, mangabeys, some macaques
		③ New World semibrachiation Swinging beneath branches by arms, legs, and prehensile tail; quadrupedal running and walking also used.	Howler monkey, spider monkey, woolly monkey, woolly spider monkey
	Terrestrial	④ Old World semibrachiation Arm-swinging combined with climbing; quadrupedal walking and leaping	Colobus monkeys, langurs, and relatives (Colobinae)
		⑤ Ground Running and walking Quadrupedal walking and running on soles and undersides of fingers	Baboons, some macaques, patas monkey
	⑥ Knuckle-walking Quadrupedal walking and running on soles and backs of curled fingers	Chimpanzee, gorilla	
	BRACHIATION	True Brachiation Arm-swinging, bipedal walking on branches	Gibbon, siamang
		Modified Brachiation Arm-swinging, with feet used for support, climbing, hanging by feet	Orangutan
Bipedalism		Striding upright on hindlimbs alone	Man

1. VERTICAL CLINGING AND LEAPING

This type of locomotion is found only among the prosimians. It involves leaping from one vertical support to another, using the hind limbs for propulsion. The trunk is held in an upright position at rest, and the forelimbs are used for clinging to tree trunks and other vertical supports. The prosimians with this type of locomotion are primarily arboreal, but can hop on the hind limbs when placed on the ground.

The main bodily feature associated with this locomotor pattern is the elongation of hind limbs which are used as springs in leaping. This form of locomotion is found in species with widely different ecological niches, from nocturnal insectivores to diurnal vegetarians. It may be a basic primate locomotor adaptation which was achieved very early in the evolutionary history of the order and has been retained in a few prosimian groups today. If so, it may have begun the trend towards an upright posture in the primates.

2. QUADRUPEDALISM

✓ Within this type of locomotory adaptation, two distinct traits can be differentiated - Arboreal and Terrestrial quadrupedalism. In this general category, both fore and hind limbs are used in locomotion. There are also several sub-types in this category which differ mainly in the degree to which climbing, leaping and swinging are employed in addition to quadrupedal running or walking.

(A) ARBOREAL QUADRUPEDALISM:

Slow Climbing Quadrupedalism: The primates which show this type of locomotory adaptation combine slow climbing and deliberate movement with a powerful grip. The adaptation includes reduction in the index fingers and the thumb, and big toes are splayed out at a wide angle. Such an anatomical change allows them to use their hands and feet like forceps to enclose a branch in a firm grip. For example, Lorises, Pottos.

Branch Running and Walking Quadrupedalism: The primates adapted to this type of locomotion are usually seen walking or running along the tops of branches. Their fore limbs and hind limbs are of equal length though the hind limbs are slightly longer. Since the tree-shrews and marmosets have claws, they hold on to the branches with their claws while the others use their prehensile hands and feet to grasp the branches. Gaps in the trees are crossed by leaping and the tails are used for balance.

Old World Semi-brachiation: Found in the old world monkeys, the animals adapted to this type of locomotion are found spending a good deal of time swinging beneath the branches. The anatomical changes adapted to this type of locomotion are the presence of short, broad trunks, elongated arms, and long fingered hands and all but the wooly and howler monkeys have reduced thumbs. These animals not only swing but also leap.

New World Semi-brachiation: The new world members of this semi-brachiating group have prehensile tails which they also use to suspend themselves. In rest of the characteristics, this group resembles the old-world semi-brachiating primates.

(B) TERRESTRIAL QUADRUPEDALISM:

There are two distinct terrestrial quadrupedal locomotory adaptations - the ground running and walking and knuckle walking.

Ground Running and Walking: The baboons and patas monkeys run and walk on the ground, on the soles of their feet. Their limbs are of about equal length. They do not have to grasp the surface on which they walk as their arboreal relatives do. The hand proportions, notably the relative lengths of the thumb and index finger, favor a more effective precision grip in this group than in arboreal quadrupeds.

Knuckle Walking Quadrupedalism: This type of locomotion is a secondary adaptation to ground living. The chimpanzee and gorilla have become quadrupedal, probably because of their large body size, but at

Anthropology Paper 01 - Volume 01

the same time have retained the long arms, long fingers, and short thumbs of their brachiating ancestors. While they walk on all fours, their torso is actually slanted with the head end higher because of their disproportionately long arms. Chimpanzees do climb and brachiate in trees while feeding, but return to the ground and knuckle-walk when traveling. The anatomical changes associated with this type of locomotion are the elongation of pelvis; the hand of femur not forming great angle with the shaft which restricts the movement of leg; habitually bent knee and the whole foot making contact with the surface.

3. BRACHIATION

Brachiation is again of two sub-types - True brachiation and Modified brachiation.

True Brachiation: Gibbon and Siamang are true brachiators. These are the good models for studying bodily adaptations to these locomotor patterns and for investigating its adaptive value. In brachiation, the body weight is suspended from the arms and hands beneath the branches and progression is accomplished by swinging the body from one handhold to another. The hind limbs are sometimes used for support and occasionally for suspension as well. The gibbon body combines relatively light-body weight with long arms and long fingered hands. Since the hands must function as hooks during brachiation, a long opposable thumb is in the way. All of the brachiators have some means of getting their thumbs out of the way during locomotion. Some, like new world spider monkey or the African Colobus monkey, have thumbs that are absent or reduced to tubercles. Others, like the woolly monkey, use their thumb like another finger to form part of the hook. The gibbon which has a relatively long thumb gets it out of the way by tucking it up against the side of the first finger. Field studies of the gibbon have shown that brachiation is a locomotor adaptation which is primarily useful for feeding at the terminal ends of branches. The animal will hang from the branch with one hand and use his weight to bend the branch toward him while plucking fruit with the other hand.

Modified Brachiation: This type, found in the orangutans, involves arms swinging with feet used for support, climbing and hanging by feet. The orangutans are really cautious climbers than brachiators, and climb using any combination of their four grasping extremities.

4. BIPEDALISM

Found in the human beings, it involves the hind limbs alone supporting the body weight and propel it along the ground. The main bodily modifications involve the elongation of legs and changes in the foot and pelvis. In the foot, the big toe is no longer opposable, but has been brought into line with the other toes, an arch has developed, and the heel has become longer to aid in balance. Thus, the grasping primate foot is lost in man due to the need for the feet to bear the body weight. The pelvis has become short, broad and basin shaped. It must hold the abdominal viscera and provide areas of attachment for the muscles which hold the body upright and move the legs. The reasons why man's ancestors first adopted bipedalism are unknown and speculative. Other primates have come to the ground and abandoned the forests, but none have become bipedal except man. One of the main advantages of this locomotor pattern is that it frees the hand from locomotion, so they can be used in carrying and manipulating objects such as tools.

SKELETAL CHANGES DUE TO BIPEDALISM AND THEIR IMPLICATIONS (F K H S E V)

The evolution of bipedalism approximately four million years ago has led to significant changes in the anatomy of Homo sapiens. The morphological alterations to the human skeleton that have occurred since the first bipedal hominid include changes in foot bone arrangement and size, hip size and shape, knee size, leg length, and vertebral column shape and orientation. The evolutionary factors that produced these changes have been the subject of several theories.

1. **Foot:** The human foot has been redesigned to act as a platform to support the entire weight of the body, rather than acting as a grasping structure, as it did in early hominids. Humans therefore have smaller toes than their bipedal ancestors. This includes a non-opposable hallux (Big Toe), which is relocated in line

(2)

with the other toes. Moreover, humans have a foot arch rather than flat feet. When non-human hominids walk upright, weight is transmitted from the heel, along the outside of the foot, and then through the middle toes. Conversely, a human foot transmits weight from the heel, along the outside of the foot, across the ball of the foot, and finally through the big toe; this transference of weight contributes to energy conservation during locomotion.

2 **Hip:** Modern human hip joints are larger than quadrupedal ancestral species to better support the greater amount of body weight passing through them, as well as a shorter, broader shape. This alteration in shape brought the vertebral column closer to the hip joint, providing a stable base for support of the trunk while walking upright. Also, because bipedal walking requires humans to balance on a relatively unstable ball and socket joint the placement of the vertebral column closer to the hip joint allows humans to invest less muscular effort to balance. The shape change of the hip may have led to the decrease in the degree of hip extension, an energy efficient adaptation.

3 **Knee:** Human knee joints are enlarged for the same reason as the hip – to better support an increased amount of body weight. The degree of knee extension (the angle between the thigh and shank in a walking cycle) has decreased. The changing pattern of the knee joint angle of humans shows a small extension peak, called the “double knee action,” in the midstance phase. Double knee action decreases energy lost by vertical movement of the center of gravity. Humans walk with their knees kept straight and the thighs bent inward so that the knees are almost directly under the body, rather than out to the side, as is the case in ancestral hominids. This type of gait also increases balance.

4 **Limbs:** An increase in leg length since the evolution of bipedalism changed how leg muscles functioned in upright gait. In humans, the push in walking comes from the leg muscles acting at the ankle. A longer leg allows the use of the natural swing of the limb so that when walking, humans do not need to use muscle to swing the other leg forward for the next step. As a consequence, as the human forelimbs are not needed for locomotion, they are instead optimized for carrying, holding, and manipulating objects with great precision.

5 **Skull:** The human skull is balanced on the vertebral column: The foramen magnum is located inferiorly under the skull which puts much of the weight of the head behind the spine. Furthermore, the flat human face help maintaining the balance on the occipital condyles. Because of this arrangement, the erect position of the head is possible without the prominent supraorbital ridges and the strong muscular attachments found in, for example, apes. As a result, in humans, the muscles of the forehead (the occipitofrontalis) are only used for facial expressions.

6 **Vertebral column:** The vertebral column of humans takes a forward bend in the lumbar (lower) region and a backward bend in the thoracic (upper) region. Without the lumbar curve, the vertebral column would always lean forward, a position that requires much more muscular effort for bipedal animals. With a forward bend, humans use less muscular effort to stand and walk upright. Together, the lumbar and thoracic curves bring the body's center of gravity directly over the feet. Also, the degree of body elevation (the angle of body incline to a vertical line in a walking cycle) is significantly smaller to conserve energy.

Significance

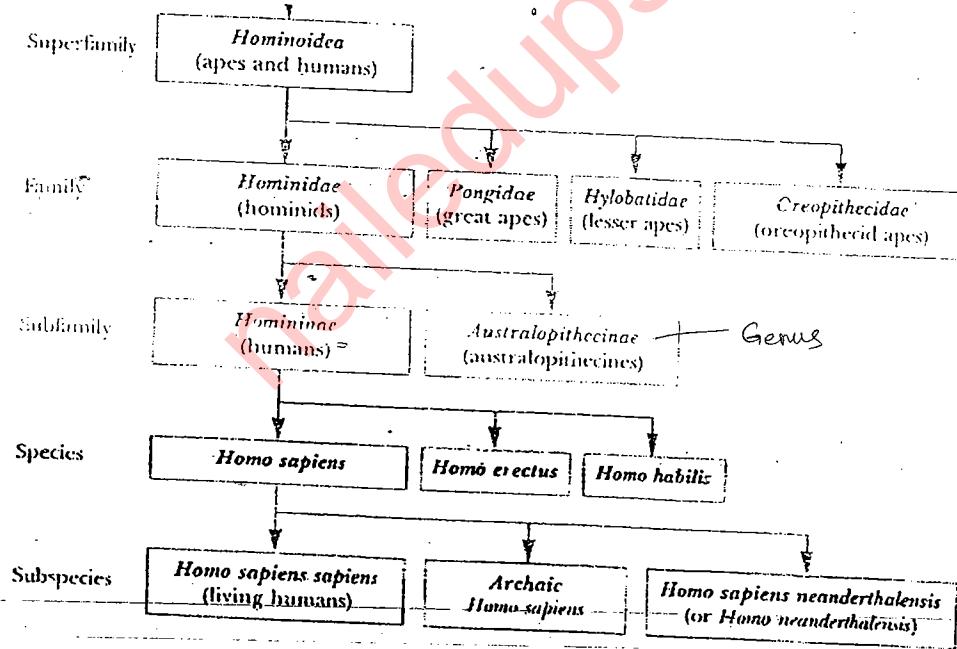
Even with much anatomical modification, some features of the human skeleton remain poorly adapted to bipedalism, leading to negative implications prevalent in humans today. The lower back and knee joints are plagued by osteological malfunction, with lower back pain among the leading causes of lost working days. These problems resulted because human joints are forced to support more weight in bipedalism, now that the body's full weight is borne on two legs rather than four. In fact, arthritis has been a problem since hominids became bipedal. Scientists have discovered instances of vertebral arthritis in prehistoric hunter-gatherers; arthritis is not merely pathology of modern lifestyles. Physical constraints have made it difficult to modify the joints for further stability while maintaining efficiency of locomotion.

1.6 PHYLOGENETIC STATUS, CHARACTERISTICS, AND DISTRIBUTION OF HUMAN FOSSIL ANCESTORS FROM MAMMALS TO HUMANS

The geological time scale starts with the formation of the earth, some 4.6 billion years ago. The first and longest span of time was the Precambrian, where forms of life were mainly small, simple, and soft-bodied. The onset of the Cambrian about 570 million years ago marked the rise of shelled animals in the sea. Then followed the "ages" of the fish, Amphibians and Reptiles, culminating in the domination of land by the dinosaurs, from about 200 to 65 million years ago.

Mammals first appeared more than 200 million years ago, but were overshadowed by the reptiles. However, some 65 million years ago all the dinosaurs – as well as other groups of reptiles on land, in the sea and in the air, and certain other animal groups and many plants too – became extinct over a relatively short period. This was only one of several "mass extinctions" that have occurred through geological time. The extinction marked the beginning of the Tertiary period and the Age of Mammals. The Tertiary is divided into epochs, and developments in the primate group can be traced from the fossils they left in the rocks formed during the time.

✓ The first hominids (members of our own family Hominidae) crop up in the fossil record less than 4 million years ago. Mammalian evolution covers only about 4 percent of the Earth's entire history, and humans have been around for only 0.1 percent of the history of our planet.



HUMAN ORIGINS

The quest for our ultimate origins begins with the origin of life itself. The earth is about 4.6 billion years old. Fossil evidence shows that small, simple organisms were living at least 3 billion years ago. A great deal of evidence supports the notion that all present day organisms are related to each other, and these forms as diverse as slime molds and elephants, oak trees and beetles, roses and humans – ultimately arose from a single common ancestor, some 3.5 billion years ago. This means that a single evolutionary tree, or phylogeny, relates all organisms, living and extinct. Biologists and paleontologists assume that life

evolved from its simple beginnings through a succession of stages, as represented in the fossil record, toward the present day diversity of some 10-30 million species. This does not mean that today's diversity is in some way the destiny or the end-point of evolution; there has been great diversity in the past, and there may be in the future.

RAMAPITHECUS (Only Pg - 34 - Paper 2 BT) (see pg-50, last two paras)

The last and most important hominid from Miocene is Ramapithecus. It is accepted by many scholars to be the first true hominid. The fossils of Ramapithecus (primarily teeth and jaw) come from two areas: the Siwalik Hills in India and Fort Ternan in Kenya. Other specimens have been discovered from Turkey, Hungary and Greece. The Ramapithecine fossils roughly date back to periods between 14 and 9 million years ago. The ecological setting of Fort Ternan and the Siwalik Hills fossils is that of a forest woodland environment. The Greek fossils, being younger, are that of a drier, savanna like environment.

The hominid features of Ramapithecus include reduced and vertically implanted incisors, and canines, little or no diastema, flattened and thick enameled premolars and molars that appear to be adapted for heavy chewing and processing of heavy food stuffs. Moreover, the placements of chewing muscles indicate an increased chewing pressure brought to bear on the food being eaten. These features, sufficiently different from the earlier Miocene fossils, indicate Ramapithecus direction to hominid line - perhaps the first hominid.

Ramapithecus specimens very strongly suggest the exploitation of a new dietary source - most likely seeds, nuts and grasses - that indicate a shift away from the softer forest fruits and vegetables relied upon by apes. This dietary shift is rather clearly associated with the climatic changes in the later part of Miocene that led to an increase in open grasslands and the decrease in the forest habitat of apes. There is a greater probability that this hominid form apparently was moving into a new ecological niche; it was beginning to exploit a more open ground environment similar to that inhabited by later hominids. Ramapithecus is also the most likely candidate for the ancestry of later hominids because of its presence in an area where the next hominids - the Australopithecines - have been found.

The possible adaptations that Ramapithecus made to open-ground living include an increased degree of hand and finger preparation of food, perhaps more frequent use of tools in such preparation, a tendency towards upright posture and bipedal locomotion for movement with a wide field of vision through the tall grasses on the open plain, possibly longer periods of growth and development, and perhaps, even a more frequent inclusion of meat in the diet. None of these adaptations can be clearly demonstrated because of lack of fossil evidences, but what we do know is that these adaptations were clearly present by the time the next phase of hominid evolution - the australopithecines - had begun. It is highly likely that Ramapithecus had begun to evolve and acquire those hominid features that led to the evolution of australopithecines.

(A) Plio-pleistocene hominids in South and East Africa - Australopithecines (Page - 8)

After the youngest Ramapithecus, there is about 4 million years gap; then new hominid forms appear.

These fossils show a continuation and elaboration of the basic hominid evolutionary trends. They are at least partially erect, bipedal, with reduced snouts and expanded braincases. They emerged on the rolling savannas of eastern and southern Africa some 5-6 million years ago. (Pliocene)

6
hominid
feature
1

5
expand
brain
case

1 There is a remarkable range of physical variation among these specimens, and this has made it difficult for scholars to discern where they fit in the evolutionary sequence. These variations in body size, facial shape, and brain size were caused by a number of factors, including sexual dimorphism, and localized adaptations to differences in the environment. It now appears that we can classify them into two major, largely contemporaneous groups - the robust forms and the gracile forms. These suggest two separate and distinct lines of evolution.

(Slender)

- (2) Lived b/w 1.97 to 1.78 mya - South African Hominin
 - (3) Berger suggested that it might have descended from *A. africanus* & could be one of last links in evolutionary line b/w Australopithecines & Homo.
 - (4) Features - small brain (420-430 cc); body size; long arms → These are A' features
 - (5) Some features like Dental size, shape especially molars, canines; Broad frontal region; Broad pelvic region - have developed independently in Homo & *A. sediba*.
 - (6) Much more research is needed to ascertain phylogenetic status of *A. sediba*. Anthropology Paper 01 - Volume 01
- 5 ✓ The robust forms do not represent the main line of hominid evolution but are an aberrant sideline. Hominid evolution continued with the gracile or slender forms. To reflect this growing realization, australopithecines are divided into two genera - **Australopithecus**, which includes the slender forms like *A. africanus*, *A. aferensis*, *A. ramidus* and *A. anamensis*; and **Paranthropus** - which includes the robust forms - *P. robustus* and *P. boisei*.

Geographical Distribution (Dart, Robert Brown, Richard Leakey)

- 1 ✓ It was in 1925, Dart discovered the first fossil from Taung in South Africa. In 1936, Robert Brown discovered an adult cranium from Sterkfontein. Dart, Brown and Robinson discovered many more fossils at Kromdraai, Swartkrans, Makapansgat etc. In 1960s and 1970s many similar fossils have been discovered from Olduvai George in North Tanzania by Leakey, Hadar in Ethiopia by Johanson and Timothy White. Richard Leakey discovered similar fossil from Omo and Koobi Fora, in 1994, from Aramis, Ethiopia by White and in 1995 from Kanapoi, Kenya by Leaky.
- 2 ✓ Distribution of the australopithecines outside Africa is doubtful. In Africa, they are scattered in south and east. The distribution of this fossil type is summed up below.

South Africa

1. Taung, Cape province - *A. africanus*;
2. Sterkfontein, Transvaal - *A. africanus*;
3. Kromdraai, Transvaal - *P. robustus*;
4. Makapansgat, Transvaal - *A. africanus*;
5. Swartkrans, Transvaal - *P. robustus*.

East Africa

1. Tanzania - Garusi, Olduvai - *P. boisei*
2. Kenya - Lake Turkana - *P. boisei*
3. Ethiopia - Lake Omo - *P. robustus*
4. Ethiopia - Aramis - *A. ramidus*
5. Kenya - Kanapoi - *A. anamensis*.

(Gracile (Vs) Robustus - Table)
P. Robustus
P. Aeth.

A USTRALOPITHECUS

- (1) This genus includes the gracile forms and is represented by four important species mentioned earlier.
- (2) These creatures were roughly four feet tall, and weighed no more than 50 to 100 lbs. as mature forms.
- (3) They were bipedal and erect and lived in open savanna country. Their bone structure was much less rugged compared to their robust relatives, and they generally lacked the sagittal crest - a bony crest running down the middle top of head which served as a platform for the attachment of massive muscles that worked the jaw. Their teeth were fully hominid with small canines and incisors, no canine diastema and thick cheek teeth or the molars. Compared to *Paranthropus*, their incisors and canines were slightly larger and premolars and molars were slightly smaller.

General Characteristics

1. A well developed fore-head suggesting the expansion of frontal lobes of brain.
2. Weakly developed supra-orbital ridges.
3. An elevated cranial vault indicating that a major portion of brain lies above the level of face, unlike pongids or apes where it is behind or below the face level.

(pg-8)

- pelvis not yet broadened & rounded (compared to humans)
- lumbar curve not fully developed
- Foot arches (front to rear & sideways)

Anthropology Paper 01 - Volume 01

4. An estimated cranial capacity of 450-600 cc. Relative to its body size, Australopithecus has a slightly larger brain.
5. Skull probably is well balanced and foramen magnum placed slightly forward. This partially indicates an erect posture.
6. Extremely prognathous (forward jutting) lower jaw and relatively large jaws in general.
7. Hominid dentition and parabolic dental arcade. Small canines, incisors, no diastema
8. No sagittal crest indicating weak temporal muscles.
9. Hominid post cranial skeleton and ilium of pelvis is broad and short indicating a bipedal locomotion. Probably a better runner than a walker.
10. Non-divergent big toe.

These morphological characteristics of the genus Australopithecus, in general, suggest them to be ancestors to modern man.

PARANTHROPUS

These robust adults average close to 5 ft in height and may have weighed as much as 100-150 lbs. They had the limbs of erect and efficient bipeds and were thus well adapted to the savanna grassland environment which they inhabited during the late Pliocene and early Pleistocene. Their cranial capacity approximated 500 cc. They had heavy brow ridges, no vertical forehead and sagittal crest. Their teeth were fully hominid, arranged in a parabolic arch with relatively small incisors and canines, and no canine diastema. Their premolars and molars, however, were quite large.

This genus is represented by two species - *P.robustus* and *P.boisei*. *P.robustus* was a massive form from South Africa measuring 3 ft 11 inches and weighing around 40 - 80 Kgs. They had larger cranial capacity with pronounced supra-orbital ridges and massive zygomatic arch.

The fossil *P.boisei* was from East Africa measuring 4 feet 4 inches tall and 40-80 Kgs in weight. Previously it was referred to as *Zinanthropus boisei* by the Leakey's. These fossils were also discovered from Tanzania, Kenya and Ethiopia.

General Characteristics

1. Height averaged 4 feet and weight about 120 lbs.
2. Skull larger than Australopithecus.
3. Cranial capacity is around 450 - 600 cc compared to body size. This animal had a lower brain to body size ratio compared to its australopithecine counterpart.
4. Large supra orbital ridges without conspicuous forehead.
5. Cranial vault is not well rounded and expanded.
6. Moderately developed sagittal crest.
7. Massive jaws with moderate prognathism.
8. More extensive neck muscles.
9. Forwardly (slightly) placed foramen magnum on the skull base.
10. Parabolic dental arcade with slightly more U-shape. Entire dentition probably designed for extreme crushing and grinding. Molars, premolars larger than A¹
Canine, Incisors smaller " "

✓ 11. Post-cranial skeleton shows a mixture of Gorilloid and Hominid traits.

12. Hand skeleton indicates knuckle-walking.

13. Divergent big toe.

- ✓ The general characteristics of *Paranthropus* made Robinson suggest an arboreal adaptation of this fossil.
 ✓ Though the total morphological pattern shows some pongid traits, it is a hominid without any controversy. Probably these creatures adapted to an ecological niche similar to that of Gorillas.

AUSTRALOPITHECUS AND PARANTHROPOUS - A COMPARISON

TRAIT	AUSTRALOPITHECUS	PARANTHROPOUS
Cranial capacity	450 - 600 cc	450 - 600 cc (Body to Brain to body ratio is less compared to A)
Cranial vault	High and expanded	Low placed and not expanded
Sagittal crest	Present	Absent in male
Frontal region	Rounded and well developed	Under developed
Supra-orbital ridges	No development	Well developed
Jaws	Large	Massive
Simian shelf	Absent	Present
Dental Arcade	Parabolic	Less parabolic, U-like
Foramen magnum	Hominid like, but not in modern position	Even more forwardly placed
Foot	Non-divergent big toe	Divergent big toe

Phylogenetic Implications (pg - 80 - Target notes)

✓ These Pliocene & Pleistocene fossils have shown both hominid and ape-like features. However, the hominid features are overwhelming. The presence of ape-like features can be accounted for by way of common inheritance from a hominoid or pongid ancestor. The Hominid characters however can be accounted for by way of independent acquisition demonstrating and highlighting the fact that these fossils were on a direct line of human evolution and not pongid line. There are many schools of thought prevailing with reference to the course of evolution these australopithecines have taken. The most important of these are discussed below.

Two Branch theory
 According to Donald C. Johnson and Timothy White, the East African fossil *Australopithecus aferensis* split into two branches, an australopithecine line represented by *A.africanus*, *P.robustus*, *P.boisei* and a hominid line represented by *Homo habilis*, *Homo erectus* and *Homo sapiens*. This split was supposed to have happened 3 million years ago. The australopithecine line progressively became robust. This pattern, generally called Two Branched Theory had its variants also. For some, it is *A.africanus* which is the common link between the Australopithecine line and Homo line. For still others, these two branches represent parallel evolution.

A. aferensis
 According to this two-branch theory, *A.aferensis* gave rise to *A.africanus* 3 mya, of the same height, living up to 2 mya. Next arrived *A.robustus*, which showed marked increase in robustness of body, face, jaws and teeth and it had lived up to 2.3 to 1.8 mya. Finally, the last and the most robust form, *A.boisei*, lived in East Africa from roughly 1.8 to 1 mya.

Homo habilis - Oldowan

Homo erectus - Acheulian
Clactonian
Abbevillian

Rhodesian - Pre-Neanderthal

Neanderthal - Mousterian tool tradition; Mousterian
(flake tools)

Modern Man - Magdalenian
Gravettian
Solutrean
Late Mousterian
Aurignacian

Anthropology Paper 01 - Volume 01

The second branch of this model, the Homo line, also shows a shortening of the face but there is a marked decrease in the size of both the cheek teeth and the front teeth. There is a massive increase in the size of brain also. This line begins with a transition from A. aferensis to H. habilis, the first hominid who made and used tools, and lived in Africa from 2 - 1.5 mya. They had human like teeth and a larger brain than australopithecines (750 cc). However, we can conclude that hominid evolution may not have been so simple, isolated and clear-cut in its operation. Instead, there is a possibility that three or more hominid lineages may have been evolving and interacting with each other.

This two branch theory was widely accepted till the discovery of a new type of hominid skull - Australopithecus aethiopicus, in Northern Kenya in 1985 by Alan Walker. This skull is considered to be the most robust form ever discovered. It had massive teeth and ape-like brain. The dating of this specimen indicates that the family of A. boisei did not evolve in the last leg of the australopithecine evolution, as indicated by earlier theory, but it originated directly from A. aferensis. Thus, the revised theory holds a three line evolutionary sequence, one to boisei line, second to Homo and third to africanus, robustus line having A. aferensis as the common ancestor.

The discovery of the youngest Australopithecine - A. ramidus has added a new dimension to the three branch theory. It holds that A. aferensis is the common ancestor for Homo, P. boisei and P. robustus but it itself evolved from A. ramidus. With over specialization of diet, competition for food with H. habilis and the latter's predation along with H. erectus led to the extinction of the australopithecine group.

HOMO HABILIS (2-1.5 mya)

1. In the early 1960s, the Leakey's discovered at Olduvai Gorge, close to and contemporaneous with Australopithecus boisei, a form that appeared much closer to modern human beings. Its features were more refined, with somewhat more modern teeth. The average cranial capacity of the specimen proved to be about 640 cc. They concluded that they found the first "real" human beings; and they called these finds Homo habilis. To this day, the taxonomic status of H. habilis is disputed. Some regard them as more modern australopithecine forms. These forms are considered to be on a direct evolutionary line between the Australopithecines and Homo erectus, the more primitive Paranthropus is best viewed as a side branch on the tree of human evolution.
2. In 1994, Bernard Wood emphasized that the foramen magnum is further forwardly placed in H. habilis. The teeth are narrower than, but not as small as that of, H. erectus. The age of the fossil is estimated to be around 2 - 1.5 mya.

General Characteristics

1. The cranial capacity ranges between 650 - 800 cc. The cranial capacity was greater than that of australopithecines and approached that of H. erectus. The brain to body size ratio also suggested evolutionary advancement. Foramen magnum further forwardly placed
2. Unlike australopithecines, the frontal lobes (seats of mental abilities) of brain were well developed. They almost approximated that of modern man. The cranial vault was rounded.
3. Hominid dental structure. The premolars are particularly human-like.
4. The mandibles (lower jaw) are comparatively less massive than that of australopithecines. However, the dental arcade was not parabolic.
5. The hind limb morphology clearly approached the human foot.
6. H. habilis was a tool maker. The toolkit is referred to as "Oldowan industry". It included cutting tools, scraping tools and tools to make tools. Meat, plants and wood were worked upon. Bones, seeds and nuts were cracked open. There is an evidence of campsites also.

- ✓ 7. Larger brain involves longer gestation, larger newborns and greater longevity. The brain enlargement was perhaps the cause and the effect of dietary shifts in *H. habilis*.

Distribution
The distribution of *H. habilis* and *P. boisei* overlap. Both are found in East Africa during 2 to 1 mya. *Homo habilis* originated from some gracile australopithecines and represents a massive increase in brain size in a short span of time. Some scholars disagree to the view that these are true homo. Their teeth are large relative to body size and their limb proportions show they are closer to australopithecines than homo. Some even suggest placing these fossils in separate genus.

Phylogenetic Implications

- ✓ 1 There has always been a question haunting the students of Paleoanthropology; why *Homo habilis*, not *Australopithecus habilis*?

- ✓ 2 One of the main criteria for inclusion in the genus *Homo* was brain size. Different authorities had different threshold sizes, ranging from 700-800 cc. Most australopithecines were around 500 cc, while *Homo erectus* was above 1000 cc. What of *H. habilis*?

For some others, a brain size of more than 600 cc would suffice for inclusion in *Homo*, along with other features indicated by the fossils, such as upright posture and bipedal walking, and a precision grip in the hand. The first *H. habilis* specimen had a brain size estimated at 680 cc.

- ✓ 3 With the discovery of the Oldowan tool tradition, the discussion centered on tool making. Many authorities were unhappy about tools as admissible evidence in support of this new species. The history of hominid fossil discoveries is littered with names coined in excitement of a new find. Many of these names have not stood the test of time.

In the mid 1960s, many people thought it probable that *Homo erectus* had evolved from some type of australopithecine. Therefore, it would be natural to find fossils representing transitional form - the result of evolution in action. Rather than create a separate species, this new form should be placed either with its predecessors, the australopithecines, or with its successor, *Homo erectus*. According to Le Gros Clark, *Homo habilis* can be easily accommodated within *A. africanus*.

- ✓ 4 There were plenty of other opinions about where *Homo habilis* fitted into the Hominid evolutionary tree. Leaky long held the view that our modern species, *Homo sapiens* was in fact very ancient and could be a direct descendant of *Homo habilis*. This would push *Homo erectus* out onto a limb, making it our cousin and not our ancestor.

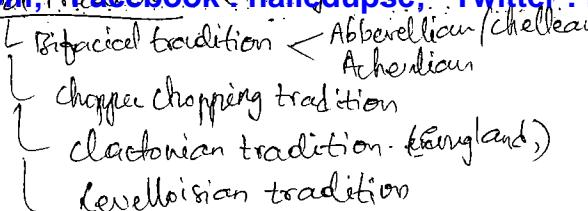
In 1972, Richard discovered a skull at Koobi Fora which had a cranial capacity of 800 cc. A brain size of this surely meant the creature to be a member of genus *Homo*?

Till today more than 20 *Homo habilis* individuals have been found. Besides having a bigger brain than australopithecines, *Homo habilis* also had a higher brain-to-body ratio. Compared to apes, the temporal lobes which deal with memory and other mental functions are more developed; so are the parietal lobes which analyze information coming in from senses and the speech processing area is also developed.

The version of our evolutionary tree in which *A. aferensis* gave rise to *H. habilis*, which evolved into *Homo erectus*, which in turn produced *Homo sapiens*, has an appealingly neat straight line feel to it. But standing back from the main *habilis* time period, about 1.9 - 1.6 mya, brings various complications.

- ✓ 5 What about before the *habilines*? An alternative to the *aferensis* - *habilis* - *erectus* - *sapiens* view is that "early *Homo*" was already living more than 3 mya. Gradually the early *Homo* became *Homo sapiens*. Whether it passed through the *habilis* stage on the way is an area of lively debate.

- ✓ What about after the *habilines*? By 1.6 million years ago, another human species had appeared. The taller, long-legged, bigger brained *Homo erectus*. If *habilis* did evolve into *erectus*, could such a great evolutionary change have taken place so quickly? One possibility is punctuation - a rapid burst of change



- ① First use of fire
- ② Food Gathering / Hunting
- ③ Ritual Activities
- ④ Cannibalism
- ⑤ Language & Communication

Anthropology Paper 01 - Volume 01

in the type of evolutionary process known as punctuated equilibrium. Another is that some relatively isolated hominid populations began to evolve into *erectus* at much earlier date, leaving the rest of their kind to continue unchanged, and eventually go extinct about 1.6 million years ago.

6. The time between 2 and 1.5 million years ago has been called the "crucial humanizing period". Recent fossil finds from this time have widened the debate as to how many species of hominids lived in Africa then, and who evolved into what. More fossils may serve to clarify the picture, or further to confuse it.

(B) *Homo erectus* (1.6 to 0.12 mya) + Notes - Pg-89

In the year 1891, Eugene Dubois discovered a fossil skullcap with few associated teeth and bone, from the solo river region of Java. He provisionally named it *Anthropopithecus erectus*, "upright man-like ape". By 1894, the position regarding this fossil changed. The upright man-like ape had become *Pithecanthropus erectus*, the "upright ape-like man". The discovery of thighbone - femur - revealed a distinctly non-ape like upright stance and gait. This fossil was commonly called as the "Java Man".

1. *Homo erectus* ranged from Africa to Eurasia from over 1.6 to 0.12 mya. A primitive face characterized this hominid with considerably large brain than any of the australopithecines, approaching the lower limit of brain capacity in modern humans. This hominid made stone tools, and knew the use of fire and was probably the direct ancestor of *Homo sapiens*. It is supposed to have evolved side-by-side *Paranthropus* and became extinct by 0.12 mya in the wake of competition from more efficient *Homo* forms.

2. In the year 1921-29, W. C. Pei discovered several fossil skulls and teeth from Zhoukodian (Choukeitian) near Peking, China. These fossils were studied by Black who assigned the name *Sinanthropus pekinensis* to it. These two earlier finds from Java and China were supplemented by two more finds from these two regions. Because of the similarities of the Javanese and Chinese fossils, the different generic names were done away with. Initially the Chinese fossil was named *Pithecanthropus pekinensis*. Later even its name changed to *Homo erectus*.

3. Dubois' fossils are now regarded as the first discovered specimens of *Homo erectus*, an immediate predecessor of *Homo sapiens* that lived in Africa, Asia and Europe, from 1.6 mya to less than 300,000 years ago. The Java specimens along with those from China were renamed *Homo erectus* in 1950s by evolutionary biologist Ernst Mayr. Thus, *Homo erectus* became the first officially named pre-historic species of human genus *Homo*.

4. *Homo erectus* was about 5ft tall, with a body and limbs that were within the range of variation of modern humans. The only primitive aspect of this ancestor of ours was its head, which exhibited such features as heavy ridges of bone across the eyes, a small fore head that sloped back dramatically, a narrowing of skull behind the eye orbits, and a slight sagittal keel (all of which suggest heavy facial musculature), and a cranial capacity ranging from 900-1200 cc and averaging around 1000 cc.

5. *Homo erectus* roamed across all of the African and Eurasian continents. They came to occupy environments far beyond those that could be occupied by the australopithecines. They were, thus, far more adaptable than the australopithecines so much so that we are considering them to be a new stage of evolutionary progress beyond the australopithecines. At this stage of evolution there was cultural and behavioral progress as well. The significance of this cultural progress is that in order to adapt to the new and different ecological zones that it occupied, *Homo erectus* did not have to evolve into many different biological forms. Instead, *Homo erectus* adapted to these challenging environments primarily through learned behavioral means.

General Characteristics

Homo erectus represents an intermediate stage between *Africanus* and Hominids of late Pleistocene. Compared to *Africanus*, the skull is broader and is set lower. The cranial capacity of Java man ranged between 800 - 975 cc whereas that of Peking man, between 850 - 1300 cc. This clearly reveals that the Peking man had taken a step forward towards modern man in terms of cranial capacity. It is estimated

Anthropology Paper 01 - Volume 01

that in a period approximately one million years ago, the Hominid brain size has literally doubled from 600 to 1300 cc. Probably the capacity to make tools has brought a selection for a larger and more complicated brain.

- 6 ✓ One characteristic feature of *Homo erectus* skull is its extreme platycephaly (flatness in the head). This flatness in head is less extreme in Peking man. The frontal region has a large supra-orbital torus, a continuous bar of bone. However, in Peking man there is a trend towards the separation of this torus into two large supra-orbital ridges. The frontal region in Java man is low, but Peking man exhibits the beginning of an expansion into a true vertical forehead. The cranial bones are generally thick walled. The foramen magnum is like the modern man and is clearly located in a position indicating that it was a habitually erect and bipedal Hominid.

The table below attempts to compare both the species of *Homo erectus*.

Trait	<i>Homo erectus javanicus</i>	<i>Homo erectus pekinensis</i>
Cranial capacity	(775) - 975 cc	850 - 1300 cc
Platycephaly	Extreme	Less pronounced
Sagittal keel	Extreme	Reduced
Supra-orbital	Huge torus region	Reduced, beginning to divide into separate ridges
Mandible	Large	Reduced, modern
Chin	Absent	Slight indication of the beginning
Diastema	Occasional	Absent
Canines	Some projecting	Non-projecting

less prognathism when compared to Australopithecus.

- 7 ✓ The face of *Homo erectus* is broad and large, broad nasal aperture and nasal bridge is slightly depressed. Zygomatic bones are larger in relation to total facial dimensions. The Java specimens occasionally present a diastema and a slightly projecting and pointed canine in the upper jaw. No such diastema is noted in the lower jaw in Peking man. The canines reflect carnivorous nature of *Homo erectus*. The molars are morphologically more advanced over *A. africanus*, and exhibit **Taurodontism** - large pulp cavities and fused roots in molar teeth, as can be seen in cattle (hence the name Taurodontism). The palate is huge and parabolic. Chin and Simian shelf are absent.

- 8 ✓ The study of thigh bone in both the cases indicates that *H. erectus* was taller than Australopithecus. The Java man was 5 ft 8 inches tall while Peking man around 5 ft, 2 inches. There seem to be nothing simian about the straight and slender thigh bone. Linea aspera on the femur indicating vertical posture is present (refer to the notes on bipedalism). In the Peking man, the thigh bone is slightly shorter and bent.

The fossil remains of *Homo erectus*, particularly from Java and China demonstrate that the range of variation of many features falls within that of modern *Homo sapiens*. However, the fossil skulls are relatively thick as we find sometimes in modern man. Similarly, the teeth of *Homo erectus* were large, like those noted in contemporary American whites. The height and breadth of mandibles are larger.

- 9 ✓ During the lower and middle Pleistocene the early forms of Homo are believed to have evolved into *Homo erectus* 1.5 mya. *Homo erectus* had the requisite basic human cultural adaptation. It is believed that some kind of a vocal communication was possible even at this stage. He had a much wider geographical range and diversity of environments. He used fire, lived in caves, used animal skin for clothing and made shelters and was a big game hunter. It is believed that the beginning of rituals, formation of nuclear family

Anthropology Paper 01 - Volume 01

and some other aspects of human socio-cultural system was developed by *Homo erectus*. By the time of *Homo erectus*, human evolution strangely developed its bio-cultural bases.

There are no fossils of *Homo erectus* from less than some 200,000 years ago. What happened to them? Estimates for a world population of *Homo erectus* have been made to around 1 million. Were they our ancestors? If so, once they had spread across the continents, did the populations in each region evolve into the various *Homo sapiens* groups of today? Or did a select band of *erectus*, perhaps from Africa, become founding population of *sapiens*, and was there a continental migration of humans? This is one of the hottest areas of debate in paleoanthropology.

Phylogenetic Implications

(MR)

One might well ask: What caused the biological advance that led early Homo to evolve into *Homo erectus*? It is possible that we will never know for sure. One of the more plausible theories has been put forward by Grover S. Krantz in 1968. He points out that contemporary hunting and foraging groups with Stone Age technologies engage in what he terms persistence hunting. Humans are unique in their ability to pursue game over vast distances, literally driving their quarry into the ground. To persist despite fatigue, hunger, thirst and discouragement requires a tough minded commitment to a mental image of the success of the hunt. The ability to maintain this image for motivational purposes requires a memory of previous successes. One of the conspicuous aspects of the transition from the australopithecine stage to that of *Homo erectus* is the dramatic expansion of the size of the brain and the development of the cortex. Krantz suggests this evolutionary development underlies an improved memory and thus provided a selective advantage to those individuals who were consequently better able to keep memory images in their minds to motivate their hunting behavior.

Why did our ancestors adopt persistence hunting as a survival technique? Possibly because they were bipedal. Although bipedalism is a very useful adaptation to living in the tall grasses of savanna, and also makes tool use possible, as a form of locomotion, it is very slow. Indeed, it is far slower than the means of locomotion of the animals our ancestors hunted. Bipedalism, like all adaptive specialization, solved old problems but posed new ones in the process.

One does not have to stress persistence hunting as a selective pressure for the brain expansion and the increase in its organizational complexity that marked the transition to *Homo erectus*. After all, the information that we have about contemporary foraging groups suggests that only 20 to 30 percent of their diet is derived from hunting, and we have no reason to suspect that the ratio was much different in the case of our early ancestors. Nevertheless, the incorporation of regular, cooperative hunting into a primate social system must have had a profound and extensive impact. Virtually every aspect of social behavior must have been affected. And not only social behavior - the body itself quite probably changed significantly. These changes included physical adaptations to day time hunting like increased pigmentation of the skin, loss of fur on the body and increase in the number of sweat glands.

The next question is: Where exactly was the boundary between the australopithecines and *Homo erectus*? Clearly, many intermediate forms emerged as the australopithecines evolved. But nevertheless we find it useful to draw an arbitrary line, indicating as we have, those features that characterize the australopithecines, and those that are qualities of *Homo erectus*. The basis for separating these forms from each other is thus made clear. Also, in the same arbitrary manner, we can decide which forms are sufficiently similar to modern human beings, that we can now answer the question. Most australopithecines were sufficiently different from us to warrant being placed in a separate genus; even early Homo resembled the other australopithecines more than us. But *Homo erectus* has an overwhelming resemblance with us, from the neck down, and exhibits a brain that, in both size and complexity, widely overlaps the lower end of the range of variation of modern human brains. Thus we may, with assurance, refer to *Homo erectus* as an extinct ancestral form of human being.

Homo erectus heidelbergensis (2.5 to 1.5 million yrs ago)

West Germany
Mauer

Anthropology Paper 01 - Volume 01

- 1 ✓ For quite some period of time, the presence of *Homo erectus* in Europe has been questioned. However, in the year 1907, a mandible (lower jaw) was discovered from a sand pit at Mauer, near Heidelberg, West Germany. The site of discovery abounds in animal fossils such as those of elephant, horse, wild boar, bison, wild cat, red deer, etc. It is ascribed to the period about 450,000 years ago. This jaw, called the Heidelberg jaw, is very massive, lacks chin, but the teeth are relatively small and resemble those of the Neanderthal man. This was designated as *Homo erectus*. This jaw is believed to represent a transitional stage between *Homo erectus* and *Homo sapien neanderthalensis*. In the year 1981, Stringer assigned a date of 0.35 to 0.45 million years to this jaw.

General Characteristics

1. It had all its teeth in place.
2. The jaw is very large and massive. The general profile is broad and square in shape. Its breadth is large compared to that of the modern man.
3. The condyloid processes are blunt and rounded and are at a higher level compared to the modern man. In this case, it resembles the jaw of the Gibbon.
4. The angle of the jaw is truncated and the meeting place of two sides of mandible is very thick. These characters resemble an ape's jaw.
5. The jaw is parabolic like that of the humans.
6. Dental series is continuous without a diastema as in the modern man.
7. The teeth are of ordinary size like that of the modern man. Incisors are normal and canines do not project.
8. The jaw displays more simian features whereas the teeth display more human features.

Phylogenetic Implications

- 1 ✓ Opinions vary as to whether the owner of the Mauer mandible, "Heidelberg Man", was a representative of *Homo erectus*. The jaw shows some similarities, yet it also has features that can be interpreted as Neanderthal. It might indicate that European *Homo erectus* evolved into Neanderthal people.

(c) Neanderthal Man (0.1 mya to modern man) → Progressive (1,70,000 yrs ago - 35k) - classical

- ✓ The term Neanderthal man is given to an assemblage of fossils showing certain common features which characterize the type of specimen viz., the skull cap with limb bones and ribs recovered from a cave in the Neander valley near Düsseldorf in Germany. Thus the term Neanderthal, in the strict sense, is used to describe a series of finds from Western Europe dating from the early part of the last glacial (about 170,000 years ago) to the rise of modern man around 35,000-40,000 years ago. These have also been called Classic Neanderthals. The term Neanderthal, however, has been extended to include all series of Hominid remains dating about 100,000 years to the rise of modern man. Such specimens have been reported from Asia, Europe and Africa. The Neanderthals not conforming to the Classic form are often referred to as Progressive Neanderthals.

Distribution

Neanderthals are well known and generally consistent forms of Hominids represented by fossilized skeletal material found in caves throughout Europe including Germany, France, Belgium, Gibraltar, Italy, Yugoslavia, and Czechoslovakia; North Africa, Israel, Iraq and Uzbekistan and Central Asia. As hundreds of Neanderthal remains have been found in most parts of the world, it is not practically possible to describe all Neanderthal finds individually.

the period from about 1,00,000 to 35,000 yrs ago. 'N' stage is considered as intermediate b/w stages of *Homo erectus* & modern man.

(cave in France)

① Mousterian Tool making :- 'N' culture is designated as Mousterian Culture of Middle Palaeolithic.

- Flake industry of in tooltech is always accompanied in skeletal remains

② Cave Dwelling :- Cavefloors covered with tides

- Fire used for warming & cooking

- Caves revealed hearth places with remains of charcoal.

Anthropology Paper 01 - Volume 01

(P.T.O.)

It is now apparent that there are at least two distinct types of Neanderthal man: **Conservative type** and **Progressive type**. These two can be distinguished on the basis of their morphological features. The Conservative type has a flattened down brain case, a bun shaped protuberant occiput, marked projection of the jaws and practically no ape-like features.

The Progressive type in contrast had a laterally compressed and higher cranial vault, lower attachments of neck muscles and medium to fair development of the bony chin. The characteristics of the skeleton approximate to those of primitive but anatomically modern forms of man. We shall now take up both these types separately in detail and then discuss their relationship to *Homo sapiens*.

CLASSIC NEANDERTHALS - LA-CHAPELLE-AUX-SAINTS

1
2 types of culture by Boule

Perhaps the best preserved of all the Neanderthal skeletons of the Classic or Conservative type is that of the old man of La-Chapelle-aux-Saints found in August 1908, in a small cave of Corrèze, France. The associated material includes flint tools of Mousterian culture with retouched blades, scrapers and keeled scrapers, conforming to the Aurignacian type. The fauna included bones of mammals like woolly rhinoceros, reindeer, wild horse, bison etc. The French paleontologist M. Boule described the fossil material during 1911-1913.

General Characteristics

- ✓ The skull of the old man of La-Chapelle-aux-Saints is very large. The brain case is elongated and low, the supra orbital ridges are immense, the forehead is low and retreating, the occiput is protuberant and bun shaped and the whole braincase seems to have been flattened down. Face is long and projecting, the orbits are very large, nose is long and very broad, upper jaw is strongly prognathous, the mandible is powerful and the chin rudimentary.

A comparative evaluation of the features of face and brain-case with apes and the modern man indicates that apes differ from man in having larger face and smaller brain case. Neanderthal man, however, falls between modern man and chimpanzee both in facial projection and in the height of the cranial vault. The fossil human skull in both aspects is much nearer to the modern human type than to the chimpanzee. The crania of Conservative Neanderthals are long headed and low vaulted. The mastoid processes are small and rudimentary. These are, however, absent in apes and very well developed in modern man. The fossil skull exhibits bun-shaped and protruding occiput which is traversed from side to side by a torus for the attachment of neck muscles. In Anthropoid apes only a crest is present. This also indicates that the neck muscles and ligaments are fastened much higher up on the back of the skull than in modern man (an ape-like feature). The base of the skull exhibits many primitive features. The foramen magnum is situated further back in the skull base than in modern man. But it is much anterior compared to ape condition. The lower jaw is massive, chin is rudimentary, but no simian shelf is present. The teeth are arranged in a very broad 'U' shaped (towards being parabolic) arch with the canines set in the curve and they are not projecting. The wear of the teeth indicates that the lower jaw, while chewing, was thrust forward and retracted in a different manner than in modern man.

The trunk and the limb skeletons are well preserved in La-Chapelle-Aux-Saints specimen. The spine is short and massive; the neck vertebrae have long, almost horizontal, spiny processes quite similar to chimpanzee and much different from modern man. These processes provide attachment for the muscles and ligaments supporting the over-balanced jaw. The spines of the neck vertebrae are backwardly projected. The thigh bones are strongly bowed forward as in apes. They are also short and massive with great articular heads. It is sufficiently marked to indicate an upright carriage. Tibiae or shin bones are short and strong. The upper surface of their articular head forms the lower part of the knee joint. They are sloped backwards indicating "bent-knee walking". On the basis of long bones, it is estimated that Classic Neanderthals were of low stature varying from 5 feet 1 inch to 5 feet 5 inches.

An estimate of the cranial capacity of Conservative Neanderthals indicates that it was not very small. The cranial capacity of Gibraltar skull belonging to a female works out to 1300 c.c. while that of the La Quina

- ④ Winter clothing :- Evidence of fur, mink, fox, rabbit, deer, clothing made from furs of animals used for warmth. (in severe cold climate)
- ⑤ Bear cult :- skulls of bears found in large numbers in rectangular-lined pit, covered with stone slab.
- ⑥ Ritual Cannibalism
- ⑦ Human Burials :- some burials indicate family cemetery
- Burials accompanied by offerings like food, tools.
 - Shanidar - cave - Iraq - Flowers found
- ⑧ Language - 'k' dev in N is doubtful coz of poor dev of pharynx (shows inability to pronounce vowels)

Anthropology Paper 01 - Volume 01

✓ female skull is believed to be 1367 c.c. The cranial capacity of female skull from Neanderthal is assessed to be 1408 c.c. The old man of La-Chapelle-aux-Saints had a cranial capacity of about 1600 which is far above that of the average Europeans of today.

The endocranial casts of Neanderthal skull reveal some important features. The La-Chapelle-aux-Saints had a long, broad and low brain, the left lobe slightly larger indicating perhaps right handedness. The pattern of convolutions was simple unlike that of modern man. In Anthropoid apes, the frontal lobes constitute about 32 percent of the cerebral surface. In case of modern man it works out to 43 per cent whereas in La-Chapelle-aux-Saints it is 36 percent. These estimates are believed to demonstrate an expansion of all the lobes in comparison to Pithecanthropus. The frontal lobe is slightly less expanded but its inferior frontal convolutions (the area of speech) are prominent. The parietal lobes are greatly expanded indicating greater sensory development and the better control of manual movements. The temporal lobe is well developed and exhibits a large auditory eminence. The visual and visuo-psychic areas are increased. Thus, Neanderthal man's brain was massive and primitive, but distinctly human.

The La Chapelle remains were one of the first major Neanderthal discoveries, even though over a half century had passed since the Neander valley find of 1856. None of these earlier materials provided substantive information about the Neanderthals prior to the discovery of the La Chapelle remains. The relatively complete skeleton of the latter, with good preservation and good archaeological context, offered one of the earliest opportunities for an extensive analysis of Neanderthal characteristics. The discoverers entrusted their find to France's world renowned paleontologist Marcellin Boule for description and analysis. The combination of the most complete known remains of Neanderthal and a scientist of Boule's ability would seem too ideal, but ironically, that was not to be the case.

Boule's description of La Chapelle was widely accepted as an accurate picture of what Neanderthals had been like. As reconstructed by Boule, Neanderthals had a less than fully upright posture, walked in an awkward, lumbering manner, were much inferior to modern humans intellectually, and in short had been primitive creatures barely deserving inclusion in the genus Homo. Boule believed Neanderthals to be an extinct sideline to the mainstream human evolution and to belong to a different species than modern humans. In support of his views he cited knee joints that could not be fully extended, great toes that diverged from the others to form an apelike grasping organ, neck vertebrae more chimpanzee like than human, and a simply curved spine without the modifications found in modern humans which allow a bipedal posture with the skull balanced on the top. Consequently, Boule believed Neanderthal skulls, with their big, projecting faces and long, low brain cases, were thrust forward in a basically ape-like position. In these and dozens of other ways, including purely speculative comments about their presumed mental abilities, Boule created an image of Neanderthal people that is still recognizable in the "cave men" that inhabit the bad novels, comic books etc. Unfortunately, for many years this was also an image largely accepted by many anthropologists. These interpretations, especially when considered with the fraudulent Piltdown remains from England, seemed to preclude a direct evolutionary connection between the Neanderthals and modern humans.

Boule's view was not, of course, universal. Still, it was not until the 1950s that the extent of the fundamental errors in Boule's recognition became clear. In 1955 it was found that the gait proposed by Boule simply would not work. It implied a center of gravity too far in the front of the body's axis of support and would have precluded standing still without falling over. The final blow however came in 1957 when W.L. Straus and A.J.E. Cave reanalyzed the La Chapelle fossil. The skeleton was that of a robust male 40 to 50 years old, who had suffered from severe and extensive arthritis. To Straus and Cave it was obvious that any lack of a fully upright posture was pathological in origin. Furthermore, they contended, "Boule had made numerous errors in the reconstruction of the foot, the knee, the skull, and other parts of the skeleton". They concluded that there was "no valid reason for the assumption that the posture of Neanderthal man of the fourth glacial period differed significantly from that of present day men". They did not claim a lack of significant morphological differences, but they did rather whimsically suggest that a properly bathed, shaved, and dressed Neanderthal would probably not be noticed in a New York subway! In effect, a faulty reconstruction of an arthritic individual had been accepted for decades as

further paved way for leadership & political system.

- Ritualistic burials suggest some form of religion

⑧ N's Philosophy :- Perhaps aware of dignity of individuals & interdependence of individual & society

⑨ Ritual Cannibalism

Anthropology Paper 01 - Volume 01

typical of the Neanderthal population. Ironically, even an accurate reconstruction would have left room for misinterpretation. The La Chapelle skull, by pure chance, is among the most robust and long headed Neanderthal skulls known.

Straus and Cave are restrained in criticizing Boule, noting that he was convinced of the "sideline" nature of the Neanderthals because he believed that the true ancestors of modern human had already been identified in contemporaneous, but more modern looking fossils. Some other writers have been less charitable. Brace has suggested that Boule was essentially "anti-evolutionary" in his views, due partly to his training under the catastrophist Cuvier, and that he either consciously or unconsciously slanted his report so that it supported what Brace has called "hominid catastrophism".

To us it seems likely that the interpretations were unconsciously affected by the expectations. When judgment was required in assessing any particular part of the fossil, Boule tended to see primitive, rather than more advanced characteristics. Boule's belief in contemporaneous but more modern fossils and his still puzzling neglect of the pathologies present, especially when combined with an unusually robust specimen, resulted in a long series of errors, which collectively resulted in a seriously inaccurate picture of Neanderthal morphology, posture, and locomotion. He then postulated an even more distorted figure of Neanderthal intellect, and the concept of the archetypal "cave man" thus created, flourished for the next four decades.

PROGRESSIVE NEANDERTHALS - MOUNT CARMELITE SKELETONS

1 ✓ Neanderthal material outside Western Europe has usually been referred to as Progressive because it is less extreme than the Conservative type and exhibits many features of modern man. However, such a line of distinction is not agreed upon by many scholars, particularly in view of the discovery of a very extreme form from Rhodesia. Generally people living during the progressive phase display greater variability, rendering the Classic and Progressive designations purely simplistic. It may be stated that the earliest Neanderthals were most extreme, having long low skull, bun-shaped or angular occipital bone, and well developed brow ridges and large faced as well as some minor specializations of the post-cranial skeleton. The later discoveries, however, show that they were more like modern man. Furthermore, the extreme and the modern forms existed side by side and have often been found in the same site. These facts indicate that the Neanderthal population was a very variable one. Ever since the discovery of these Progressive Neanderthals, particularly from Palestine, the interpretation of Neanderthal problem has taken a new turn. These Progressive Neanderthals are morphologically different from Classical Neanderthals and some of them are similar to modern man. The more important finds related to Progressive Neanderthals are the Mount Carmelite skeletons.

2 ✓ The Mount Carmel skeletons were found buried in the adjoining caves which yielded Levalloiso-Mousterian culture. In terms of the time schedule, it covers a considerable part of third interglacial and the beginning of the last glaciation. The discovery was made during the excavations of the joint expedition of American School of Prehistoric Research and British School of Archaeology in Jerusalem in 1931-1932. The work was conducted under the direction of Miss Dorothy Garrod and the material was exhaustively studied by Sir Arthur Keigh and Theodore McCown. The first cave (Skuhl) yielded fragmentary remains of ten individuals and considerable number of isolated specimens. The second cave (Tibun) yielded the skeleton of an adult female, mandible of an adult male, some bones and teeth. The Skuhl material represented the Progressive Neanderthals whereas the Tibun material represented the Conservative type. The stone tool industries were the same in both caves.

3 ✓ When the Progressive people of Skuhl are compared with the Conservative type, it is noted that Conservatives are short and stocky while the Mount Carmel men are tall and the women short to medium. Both have massive heads, the face is relatively larger in the Conservatives. However, this portion of the skull is not excessively developed in the Progressive Mount Carmelites. The Progressives have medium high vault and their foreheads are not receding. Their occiputs are not compressed vertically but project beyond the attachment of neck muscles. The eyebrow ridges in both types are very large. In Palestinians

- ① Mousterian tradition.
- ② Continuation of Acheulian tradition of Lower Paleolithic
- ③ " " Clactonian " " " "
- ④ " " Levalloisian " that emerged in closing phases of Lower Paleolithic

Anthropology Paper 01 - Volume 01

they separate into medial and lateral parts and are not continuous. The Conservative Neanderthals have long and prognathous face, while in Progressive, the face is of moderate length and is orthognathous. The orbits are high in the classic type whereas they are wide and not so high in Progressives. The nose is quite variable in its proportions (lateral margins are demarcated from the face) unlike the condition found in the Conservatives. The Conservatives have much deeper jaws in the sub nasal region and the chin eminence is rudimentary. In Progressives the jaws are of moderate depth and the chin, though variable, is better developed.

The teeth are larger in the Conservatives but the molars show certain primitive features in both types. Keith and Boule have worked out the cranial capacities. In the Conservatives it works out to 1400 cc. and in Mount Carmel skulls it ranges 1518-1587 cc. However, the female skulls at Tibun have 1271 cc. whereas the Skuhl female skulls range in their cranial capacities from 1300 to 1350 cc. The comparison of the endocranial casts of two types indicate that the size and form of the brain of the Mount Carmel people lack the primitive and simian features of the Conservative type. In their limb skeleton the Palestinians neither have shorter legs nor somewhat imperfect adaptation to the human erect posture. In these characteristics the Palestinians approach modern man.

Disappearance of Neanderthal Man

Reasons for Extinction

- 1) Isolation
- 2) Paleoecological changes
- 3) Inbreeding
- 4) Genetic drift
- 5) Epidemics
- 6) Conflicts with *Homo sapiens*

The Classic Neanderthals seem to have disappeared between 35,000 to 40,000 years ago, as we have no fossil evidence thereafter. According to one view, they are believed to have been driven out by the migrations of advanced modern forms which are now referred to as *Homo sapiens sapiens*. However, some others believe that Neanderthals gave rise to modern man. Brose and Woipoff (1971), however, are of the opinion that there is a continuous development of Neanderthal man to *Homo sapiens sapiens*. They have noted that in certain sites there are continuous sequences showing a gradual transition in cultural remains from Neanderthal man to modern man. They however feel that the gradual increase in the number of specialized tools during the period indicates more efficient technology which developed by the end of the Neanderthal period. This must have reduced the selective pressures which favored large incisors and canines which were used for holding objects. Brace (1964) has also noted the tremendous amount of wear on the Neanderthal's teeth which he attributes to the use of teeth for holding objects. Binford (1968), however, suggests that differences in demographic patterns and the size of the breeding population must have been a major factor in the disappearance of Neanderthal man.

Phylogenetic Implications Ever since discovery of Neanderthal in 1850s, phylogenetic his evolutionary position was controversial.

As regards the phylogenetic implications there are two clear cut opinions:

- ✓ 1. That Progressive Neanderthals represent the Conservative type in the process of evolving into *Homo sapiens*.
- ✓ 2. That the Palestinians are hybrids between Neanderthal man and some variety of *Homo sapiens*.

These opinions indicate that Neanderthal man is our direct ancestor. However, there are two principal objections to this view:

- ✓ 1. Neanderthal man shows specialized traits which indicate an early and wide divergence from the main line of human evolution that leads to modern man.
- ✓ 2. Completely evolved modern types of fossil men were contemporary of Neanderthal man in Western Europe and hence they cannot be the descendants.

Recent discoveries of a whole series of human fossil finds exhibit in their teeth and skeletal characters the piecemeal replacement of Neanderthaloid specialization by modern morphology. The question of "Taurodontism" has also been invalidated by Senyurck (in Korn and Smith 1959) who has shown that molar teeth and enlarged pulp cavities are sporadically distributed throughout the human and infra-

Anthropology Paper 01 - Volume 01

human Primates (both fossils and modern). According to Senyurck this may be a primitive and generalized feature rather than a specialization and thus this trait was not peculiar to Neanderthal man.

As regards the hybridity of the ancient Mount Carmelites, it has been argued that such a complete range of human evolution from Conservative type of Homo sapiens would not have been possible in such a short series and brief time and space. Hooton however feels that Neanderthal man should have changed into modern man by radical race mixture. The skeletal series from the caves of Skuhl and Tibun in Palestine demonstrate this to some extent. In his estimation some individuals, particularly the females, tend to reproduce almost in the Conservative parental type, while the males usually vary towards the Progressive parental stock.

Ever since the discovery of Neanderthal man in the year 1856, his precise evolutionary position has been a source of intense controversy and this discussion still continues. The most significant points are their supposed sudden disappearance from the fossil record, their origins and their relationship to modern man (*Homo sapiens sapiens*). The Classic Neanderthals were first reported from European sites and have been associated with Mousterian culture. Their sudden disappearance has been variously attributed to epidemics, conflicts with more advanced *Homo sapiens*, changes in the climate or their possible assimilation in the gene pool of the incoming migrants. In case they really disappeared perhaps there cannot be a single cause but a combination of circumstances seems to be responsible. However, the idea of disappearance has been questioned by Brace (1964). Now there are several hundred fossil specimens of Neanderthal man from Europe and the near East. In recent years there has been an enormous addition to the samples known from the Classic sites.

In general terms, the phylogeny of Neanderthal man may be summarized in three ways using three hypotheses. The first two views are widely considered valid but the third view is less well supported.

1. Neanderthal phase of man hypothesis
2. Pre-Neanderthal hypothesis
3. Pre-sapiens hypothesis

The Neanderthal Phase of Man Hypothesis: This is considered a unilinear view. According to this hypothesis, Neanderthals arose from middle Pleistocene predecessors by successive evolution. They passed through the Neanderthal phase and finally evolved into the modern man. This suggestion was first made by Schwalbe (1904). He believed that Neanderthals were a separate species, intermediate between ape and man. Later on Brace (1964) has suggested that the dental and masticatory evolutionary changes were brought out by the use of tools which brought in cranial morphological changes from Neanderthal to modern sapient forms. This hypothesis has been duly supported by Brose and Wolpoff (1971), Wolpoff (1980), Frayer (1978, 1984) and Smith and Ranyard (1980), Smith (1982, 1984), while working on the Central and East European material also observed local continuity and change between Neanderthal and later modern sapiens.

Pre-Neanderthal Hypothesis: This view holds that the Neanderthals arose from a pre-Neanderthal stock that progressively specialized towards cold resistance and was open to severe natural selection. The restricted gene flow resulted into a Classic Neanderthal isolate represented by La Chapelle Aux Saints and many others. This specialized Neanderthal offshoot represents a group sharing new traits of subspecific taxonomic value. According to them, the parent line may have developed out of Europe and Africa as a possible source for the origin of pre-Neanderthal line as early *Homo sapiens*. The adherents to this view include Howell, Santa Luca, Stringer, Le Gros Clark etc.

Pre-Sapien Hypothesis: According to this view a European modern sapient lineage represented by Swanscombe and Steinheim existed separately from the Neanderthals, and ultimately gave rise to modern Europeans. Neanderthals, however, became extinct at the end of the early Wurm glaciation. This hypothesis was initially given by Boule (1911, 1913, and 1923). Later followers include Vallois (1954), Weiner (1958), Thoma (1965), Leakey (1972), Vecek (1978) and Saban (1982). The studies of Stringer

(1974), Hublin (1982), Brauer (1984), Smith (1984), etc. however, proved that Swanscombe and Steinheim skulls did possess Neanderthal traits and were not anatomically modern. Therefore, it is felt that they cannot be considered as a separate lineage.

(D) Rhodesian Man — Time period -?

In June 1921, T. Zwrigelaar, a Miner, found at Broke Hill in Northern Rhodesia, Africa, an almost complete cranium at about 60 feet below the ground level and about 10 feet above the floor of the cave. A human leg bone was also found at a distance of 3 feet from the cranium. More skeletal material was recovered by A. S. Armstrong in 1921 and later by H. Hrdlicka in 1925. The skeletal remains included a cranium, a left tibia, parts of the left femur, a sacrum, portions of pelvis and parts of the upper jaw of another individual. Thus, the skeletal remains represent cranial and post-cranial bones of atleast two individuals. On the basis of faunal and archaeological evidence as well as the Lead and Zinc content analysis of bones, it is concluded that Rhodesian man lived during early Pleistocene or late Pliocene. This approximates to the Solo man of Java with whom the present fossil material exhibits remarkable morphological similarities.

- ✓ A glance at this skull indicates enormous true brow ridges and a low receding forehead, which are ape-like features. Rhodesian man has chimpanzee form of brow ridges which approach the gorilla type condition in their lateral extension and median development. The brow ridges are, in fact, much larger than in any other fossil man. The forehead is much lower and narrower than in Neanderthal man. However, it displays more vaulting than *Pithecanthropus*. The brain case is primitive but of human shape. It is very long and relatively narrow. The great length may be attributed to the forward projection of brow ridges and backward projection of occipital crest. The actual brain cavity length as worked out by Keith is only 17.1 cc i.e., 81.4 percent of the total skull length (this brain cavity length is 92 per cent of skull length in Europeans, 88.5 per cent in Australian aborigines, 86.0 percent in Neanderthal man, 84.0 percent in *Pithecanthropus*, 81.0 percent in chimpanzee and 75.0 percent in gorilla). Thus, in this respect Rhodesian man is closer to apes and inferior even to *Pithecanthropus erectus*. The Rhodesian skull, however, is low vaulted but exhibits human expansion of the parietal region. According to Keith, this parietal elevation overlies the part of brain controlling movement of the limbs and also indicates upright posture. The cranial capacity varies between 1280 and 1400 c.c. The skull is dolicocephalic (cranial index 69.3). The foramen magnum is anteriorly placed and occupies a central position indicating perfect equilibrium of the skull on the vertebral column. The mastoid processes are of modern size. The greatest breadth of the skull is found near the base. Face is very large with cheek bones and strongly developed alveolar prognathism. The alveolar processes are very deep and the palate larger, wider and deeper than in modern man's.

- ✓ The teeth exhibit modern human proportions. The canines are reduced to the level of other teeth. The molars have remarkable breadth in comparison to their length. The third molars are reduced in size and degenerate. In the opinion of Keith, third molars show reduction even in chimpanzee. In Rhodesian man the pulp cavities of the teeth are not enlarged. In general the teeth are heavily affected by decay or caries. Alveolar abscesses at the roots of the molars and other teeth are noted. In the knee joint there are rheumatic changes which are believed to be due to the infection of the mouth. In addition to this there is a peculiar perforation (quarter of an inch in diameter) in front of the left ear hole and a larger eroded hole behind the ear passage. These perforations are connected by a curved tract of roughened and pitted bone. Yearsley feels that these lesions might be due to chronic septic conditions of the mouth which may have led to middle ear disease and complicated by mastoid abscess. In his view the hole in front of the ear may be due to a wound inflicted by some sharp implement during life. On the basis of his studies on these perforations, Mollson feels that these holes were made by the canine teeth of a large carnivore. Weidenreich, however, does not feel convinced. In his view the mastoid abscess theory is more plausible.

- ✓ The limb skeleton include sacrum, pelvis and leg bones of the lower extremity. They are quite human with no ape-like features. They are, however, large and very robust with massive joints. Femur is straight like man and not bowed as in Neanderthals. Keith infers that Rhodesian man must have been a heavy and powerful fellow weighing about 208 lbs. He had an erect gait and was capable of extending the leg fully

upon the thigh while walking. His stature works out to 5 feet and 10 inches. The sacrum is narrow and straight. The size and muscular markings of the bones suggest that these belong to a male individual. Thus, the skull and the limb skeleton which were separately recovered from two places are not fully compatible. Hrdlicka, after careful examination of the site and the find, feels that the limb bones do not belong to the owner of the skull. These belong to two individuals; one male and the other female. Radiometric and chemical analysis however suggest that they belong to contemporary individuals (Oakley 1950). Assuming that the skull and the limb skeleton belong to Rhodesian man (even to two different individuals), it can be said that he was an upright bipedal walker with primitive features of the skull.

Phylogenetic Implications

Woodward (1921) on the basis of the position of foramen magnum considers it to be human and assigns these to *Homo rhodesiensis*. Pycraft (1928), however, feels that he did not have erect posture as is indicated by the pelvis and assigned it to *Cyphanthropus rhodesiensis*. This contention however has not been accepted. Von Bonian feels that the skull, pelvis, femur and tibia indicate erect posture and places the Rhodesian man near the point of divergence of the Neanderthal and the modern man. Morant (1928), on the basis of metric study and comparisons, feels that Rhodesian man tends to resemble *Homo sapiens*, though it seems more closely related to Neanderthal man. In the opinion of Boule, Neanderthal man, Rhodesian man and modern Australians had a common origin. Rhodesian man may be the African variety of Neanderthals. In the opinion of Hooton there is sufficient likeness between Neanderthal and Rhodesian man so as to regard the latter as a variant of the former. In certain features Rhodesian man is inferior to Neanderthals and even to Pithecanthropus.

(E) *Homo sapiens* (Refer Material Only)

CRO-MAGNON MAN

In 1868, M. Louis Lartet excavated the rock shelter of Cro-Magnon on the banks of Vezere in the village of Les Eyzies. This site has yielded several human skeletons. There were strata containing hearths and implements of the Aurignacian culture. The human remains were recovered from the highest strata of the deposit. This material consisted of a skull and some other bones of an old man and parts of the skeletons of four other individuals at a short distance from the old man's bones. These skeletons indicate the type of man that seems to have inhabited various places in Western Europe throughout the three upper Paleolithic periods. These skeletons exhibit features quite similar to modern man. It is proposed to consider the bones of the old man of Cro-Magnon as the type of specimen of the group.

The skull is massive and large in every dimension. Its length is 20.3 cms and breadth 15.0 cms. The height above the ear holes works out to 13.2 cms. The skull is Dolicocranial with an index of 73.7. It exhibits a pentagonal contour possibly owing to the marked projection of parietal mass. Some anthropologists refer to it as Dolicopentagonal form. On the basis of the dimensions of skull the cranial capacity works out to 1660 c.c. This is about 150 cc, more than the modern European average. The forehead is broad and of moderate height and so also are the brow ridges. The occiput bulges behind. The skull is broad across the middle of the parietals. The face is relatively flat and very broad while the skull is narrow and long. This combination of a short broad face with a long narrow head is known as cranial disharmony. The orbits are extremely broad without rectilinear margin forming a quadrilateral outline. Owing to shortness of the face the orbits are very low. The cheek bones are large and protruding, nose is narrow, long and high (i.e., Leptorrhine). The maxilla exhibits pronounced prognathism. The alveolar border is prognathus. The palatine arch is that of medium size and narrow. The teeth are not extraordinary. The lower jaw is robust and that of modern conformation. The chin is prominent. The long bones indicate a stature of slightly over 5 feet 6 inches. Forearms are long in comparison to upper arms. The shins are longer in relation to thighs. The proportions of the limbs are referred to as Negroid proportion and they are not usual in modern Europeans. However, they have been noted frequently in the taller groups of the American Indians and in other races not considered Negroid. Another important

feature is a type of flattening of the thigh bones called Platymeria and also side to side flattening of the shin called Platynemia. This is attributed to the habit of walking with the knees bent on unlevelled ground. The muscular impressions are strongly marked.

Skeletons attributed to Cro-Magnon have been reported from Solutre, four miles West of Macon in East Central France. This is the typical site for the Solutrean period of the Palaeolithic age. On the basis of the original old man of Cro-Magnon, the French anthropologists refer to a race called "Cro-Magnon race" and attempted to fit into the Cro-Magnon type almost all finds of modern man belonging to late Paleolithic period. However, in this are included certain long headed but broad faced type of men who are believed to inhabit Dordogne, France and are believed to be the direct lineal descendants of ancient Cro-Magnon cave dwellers. Hooton, however, disagrees because the type referred to is very short in stature whereas the Paleolithic men were supposedly of great height. Quatrefages and Hamy referred to the existence of Cro-Magnon descendants in Dalecarlia, southern Sweden who form a special group known as 'Dal Race'. This type has also been subsequently reported from various regions of Germany. Many individuals from these areas display a series of features corresponding to those found in descendants of Cro-Magnon race. Paul Broca has noted the presence of structural affinities among the Basques, the Kabyles and the Guanchos (inhabitants of Canary Islands on the western coast of Africa). Denikar refers to the Cro-Magnon type as dark Mesocephalic, tall race called Atlanto-Mediterranean, which currently may be observed along the Atlantic and Mediterranean seacoasts of the Iberian Peninsula. However, the Guanchos of Canary Islands best represent the Cro-Magnon type. Thus, in general, the morphological characteristics of Cro-Magnon man suggest that he belongs to Homo sapiens with several distinctive characteristics. Many scholars believe that European Upper Paleolithic man exhibited a wider range of skeletal variation in their form as represented by the remains of Chancelage, Grimaldi, Predmost, Combe-capelle, etc.

GRIMALDI MAN (Italy)

Grimaldi fossil remains are referred to European Upper Paleolithic. The discovery was made in a cave near Mentone in Italy. In the Italian Riviera, just across the French frontier, there are red rocks of Grimaldi on the sea coast. On the cliffs of these rocks there are many caves where upper Paleolithic man lived. In one of the caves, called Grotte des Enfants, two skeletons were found in June 1901. Professor Verneau considered these skeletons as of Negroid type. The name of the cave seems to have been given on the basis of the skeletons of two children found in its upper strata. The excavation brought to light many habitation sites which were marked by hearths, implements and other evidences of human occupation. On the basis of faunal evidence (reindeer bones) they are referred to Pleistocene age. At the level of the second hearth from the top was located the skeleton of an old woman and at a depth of 9 feet were found the skeleton of a tall man. Verneau examined the skeleton of the tall man and assigned it to the Cro-Magnon type. The stature is estimated at 6 feet and 2-1/2 inches. The skeleton of this man was found lying on its back with a slab of red clay under his head and large stones around his feet. The associated implements refer to the Aurignacian culture.

At a depth of about 29 feet and at the level of the oldest hearth was found a grave containing two skeletons, belonging to an old woman and a boy of about 15 years. The old woman was buried with her arms doubled up under her chin and her knees flexed against her abdomen. The position of the skeleton suggests that she was lying on her right side. The boy's skeleton was slightly above and on to her right. The child's skeleton was in a loosely flexed posture with arms half bent and doubled up legs at right angles to the axis of the spine. The skeletons were stained with red ochre and the implements around the burial were of Aurignacian culture. It seems that they refer to the beginning of the Aurignacian culture.

On the basis of cranial morphology, the Grimaldi skulls are believed to have Negroid features. Both the skulls are long, narrow and high. Length of the female skull is 19.1 cms, breadth 13.1 cms and height 11.5 cms. The brow ridges are feebly developed as in the Negroid crania. The forehead is straight and well developed and slightly bulging. The skulls present a regular elliptically shaped contour with flattened parietal eminences. The cranial indices of old woman and of the adolescent boy are 68.5 and 69.2 respectively. The cranial capacity according to Keith works out to 1454 c.c. in case of the young boy and

1265 c.c. in case of old woman. The face in both the cases is rather narrow and short. However, it must be noted that the boy was in his adolescence with jaws not fully developed. The orbits are very low in comparison to their breadth as in Cro-Magnon. Nose is depressed at the root, the bridge is low and broad and nasal aperture extremely wide. The nasal index in case of female is 63.6 and in case of boy 54.3, suggesting that the nose is platyrhine. The alveolar margins in both the skulls are swollen and prognathus. The lower jaw is strong with its body very thick. The chin is not greatly developed. A strongly marked prognathism correlated with the prognathism of the upper jaw gives it a receding appearance. Most of these cranial and facial features are Negroid.

✓ Grimaldi skeletons exhibit Negroid features in the proportion of limbs. The forearm and the leg are very long in relation to the upper arm and thigh respectively. The shaft of the femur has a pronounced curvature and is strongly bent. The estimated stature of the woman works out to 5 feet 3 inches and that of the boy 5 feet 1-1/2 inches.

The Grimaldi material is believed by many anthropologists as definitely Negroid and they are commonly accepted as a good evidence of Negroid race in Europe during Aurignacian times. However, on the basis of the actual study of the material many others disagree with this view and feel that they are simply variants of the Mediterranean race now inhabiting Southern Europe. Boule and Vallois maintain that the Grimaldi skeletons represent a human type which is comparable to the modern Negritic or Negroid type. According to them, the Grimaldi exhibit resemblances to South African types, the Bushmen and Hottentots, in terms of similar Doliccephalic characters, same prognathism, same flattening of the nose, and same development of facial breadth, similar form of jaw and the great size of teeth. The differences, however, are in terms of the stature and height of the skull.

In the opinion of Hooton, the so called Negroid features of the Grimaldi merely constitute a part of the primitive complex of the so called Cro-Magnon man. The efforts to identify the Grimaldi material with Bushmen of South Africa and Hottentots are interesting but not altogether convincing. The common possession of some of the Negroid characters in the Grimaldi, together with similar Aurignacian stone industry with that of the Bushmen perhaps is the basis for the observation that Bushmen are descendants of upper Paleolithic artists of Europe. Elliot Smith and Arthur Keith, on the basis of their independent research work on the Grimaldi skeleton, have concluded that the Grimaldi merely represent the primitive type of Cro-Magnon stock and the Negroid resemblances may be just a coincidence.

CHANCELADE MAN

France

✓ The name is derived from a rock shelter near Chancelade where the discovery was made on October 1, 1888. Chancelade is 4 miles from Périgueux and lies in the centre of the Dordogne region of South Central France. The deposits on the floor of the rock shelter were 5 feet 4 inches in depth and yielded the typical fauna and implements belonging to the Magdalenian period.

The skeleton lay on its left side in the deepest stratum with its arms folded on its breasts and knees doubled up against the body. The body was powdered over with red ochre (this type of burial is practiced by Eskimos). The skeleton is believed to belong to a man between 55 and 65 years of age. The stature was short. It was 5 feet 2 inches. The limb bones were very robust and fragmentary.

✓ The skull of the Chancelade man resembles the crania of modern Eskimos. It is long and narrow (length 19.4 cms and breadth 13.5 cms) with a cranial index of 70.9. Supra orbital ridges are slightly developed with forehead bulging and rising vertically. The cranial capacity as estimated by Keith is 1530 c.c. The occiput is steep behind as in Brachycephals.

✓ Face is long and moderately broad. The cheek bones are prominent and strongly developed, which give a flat appearance to the face. The nose is long and narrow and the nasal bridge is broken. However, on the basis of the photograph of the skull Keith claims that it is high and long and at an angle never seen in Eskimo crania or in typical Mongoloid faces. The jaws do not flare outward in Eskimos. Most of the upper teeth have been lost from wear and disease. The lower teeth are not very large, molars seem to be

powerful and increase in size from first to the third. In modern man the third molar is smaller than the other two.

The post-cranial skeleton indicates that long bones are strong and massive. The muscular impressions are well marked indicating a muscular body. The upper limbs are longer unlike modern Europeans. Femur is slightly bent. The shaft of the tibia has a flattening in the transverse direction and is slightly platynemic. Foot is large, with first metatarsal distinctly separated from second toe, like in Neanderthal man.

Testup, who examined the skeleton, has shown its resemblances with Eskimos. These resemblances are based on the combination of short stature with a conspicuous dolicocephalic skull, a fairly long and broad face, narrow nasal aperture, strongly developed masticatory apparatus, flat face marked by squared cheek bones, and presence of a medial ridge like elevation of the skull roof. On the basis of these similarities and cultural similarities like the use of bone tools, needles, harpoons and bone engravings, etc., it has been claimed that the Magdalenians, following the retreat of the ice sheet northwards at the close of glacial age, eventually reached North America and thus are the ancestors of modern Eskimos. However, this view has not been fully accepted. Hooton argues that the resemblances exist but these are like many Eskimo features found in the skulls of twelfth century Icelanders of Norwegian and Irish origin. However, the possibility of a Mongoloid admixture in the man of Chancelade cannot be denied. Keith, on the other hand, has suggested that Chancelade is a European type. Many scholars are of the view that it is another variety of European upper Paleolithic man - like Cro-Magnon - but of much lower stature.

1.7 THE BIOLOGICAL BASIS OF LIFE

THE CELL

All organisms are composed of cells. Some are composed of a single cell and are called unicellular organisms while others, like us, composed of many cells, are called multicellular organisms.

What is a Cell?

Unicellular organisms are capable of (i) independent existence and (ii) performing the essential functions of life. Anything less than a complete structure of a cell does not ensure independent living. Hence, cell is the fundamental structural and functional unit of all living organisms. Anton Von Leeuwenhoek first saw and described a live cell. Robert Brown later discovered the nucleus. The invention of the microscope and its improvement leading to the electron microscope revealed all the structural details of the cell.

Cell Theory

In 1838, Malthias Schleiden, a German botanist, examined a large number of plants and observed that all plants are composed of different kinds of cells which form the tissues of the plant. At about the same time, Theodore Schwann (1839), a British Zoologist, studied different types of animal cells and reported that cells had a thin outer layer that is today known as the 'plasma membrane'. He also concluded, based on his studies on plant tissues, that the presence of cell wall is a unique character of the plant cells. On the basis of this, Schwann proposed the hypothesis that the bodies of animals and plants are composed of cells and products of cells. Schleiden and Schwann together formulated the cell theory. This theory however, did not explain as to how new cells were formed. Rudolf Virchow (1855) first explained that cells divided and new cells are formed from pre-existing cells (Omnis cellulae cellula). He modified the hypothesis of Schleiden and Schwann to give the cell theory a final shape. Cell theory as understood today is:

- (i) All living organisms are composed of cells and products of cells.
- (ii) All cells arise from pre-existing cells.

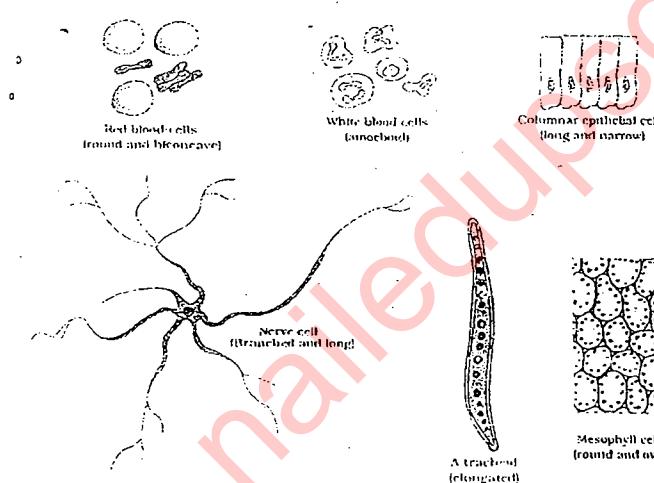
Cell - An Overview

A typical plant cell, has a distinct cell wall as its outer boundary and just within it is the cell membrane. The cells of the human cheek have an outer membrane as the delimiting structure of the cell. Inside each cell is a dense membrane bound structure called nucleus. This nucleus contains the chromosomes which in turn contain the genetic material, DNA. Cells that have membrane bound nuclei are called eukaryotic whereas cells that lack a membrane bound nucleus are prokaryotic. In both prokaryotic and eukaryotic cells, a semi-fluid matrix called cytoplasm occupies the volume of the cell. The cytoplasm is the main arena of cellular activities in both the plant and animal cells. Various chemical reactions occur in it to keep the cell in the 'living state'.

Besides the nucleus, the eukaryotic cells have other membrane bound distinct structures called organelles like the endoplasmic reticulum (ER), the golgi complex, lysosomes, mitochondria, microbodies and vacuoles. The prokaryotic cells lack such membrane bound organelles.

Ribosomes are non-membrane bound organelles found in all cells - both eukaryotic as well as prokaryotic. Within the cell, ribosomes are found not only in the cytoplasm but also within the two organelles - chloroplasts (in plants) and mitochondria and on rough ER.

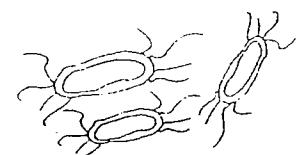
Animal cells contain another non-membrane bound organelle called centriole which helps in cell division.



Prokaryotic Cells

The prokaryotic cells are represented by bacteria, blue-green algae, mycoplasma and PPLO (Pleuro Pneumonia Like Organisms). They are generally smaller and multiply more rapidly than the eukaryotic cells. They may vary greatly in shape and size. The four basic shapes of bacteria are bacillus (rod-like), coccus (spherical), vibrio (comma-shaped) and spirillum (spiral). The organization of the prokaryotic cell is fundamentally similar even though prokaryotes exhibit a wide variety of shapes and functions. All prokaryotes have a cell wall surrounding the cell membrane. The fluid matrix filling the cell is the cytoplasm. There is no well-defined nucleus. The genetic material is basically naked, not enveloped by a nuclear membrane. In addition to the genomic DNA (the single chromosome/circular DNA), many bacteria have small circular DNA outside the genomic DNA. These smaller DNA are called plasmids. The plasmid DNA confers certain unique phenotypic characters to such bacteria. One such character is resistance to antibiotics. In higher classes you will learn that this plasmid DNA is used to monitor bacterial transformation with foreign DNA. Nuclear membrane

Cells differ greatly in size, shape and activities. For example, Mycoplasmas, the smallest cells, are only $0.3\text{ }\mu\text{m}$ in length while bacteria could be 3 to $5\text{ }\mu\text{m}$. The largest isolated single cell is the egg of an ostrich. Among multicellular organisms, human red blood cells are about $7.0\text{ }\mu\text{m}$ in diameter. Nerve cells are some of the longest cells. Cells also vary greatly in their shape. They may be disc-like, polygonal, columnar, cuboid, thread like, or even irregular. The shape of the cell may vary with the function they perform.



Typical bacteria
($1-2\text{ }\mu\text{m}$)



PPLO
(about $0.1\text{ }\mu\text{m}$)



Viruses
($0.02-0.2\text{ }\mu\text{m}$)

Anthropology Paper 01 - Volume 01

is found in eukaryotes. No organelles, like the ones in eukaryotes, are found in prokaryotic cells except for ribosomes. Prokaryotes have something unique in the form of inclusions. A specialized differentiated form of cell membrane called mesosome is the characteristic of prokaryotes. They are essentially infoldings of cell membrane.

Cell Envelope

Most prokaryotic cells, particularly the bacterial cells, have a chemically complex cell envelope. The cell envelope consists of a tightly bound three layered structure i.e., the outermost glycocalyx followed by the cell wall and then the plasma membrane. Although each layer of the envelope performs distinct function, they act together as a single protective unit. Bacteria can be classified into two groups on the basis of the differences in the cell envelopes and the manner in which they respond to the staining procedure developed by Gram viz., those that take up the gram stain are Gram positive and the others that do not are called Gram negative bacteria.

Glycocalyx differs in composition and thickness among different bacteria. It could be a loose sheath called the slime layer in some, while in others it may be thick and tough, called the capsule. The cell wall determines the shape of the cell and provides a strong structural support to prevent the bacterium from bursting or collapsing.

The plasma membrane is semi-permeable in nature and interacts with the outside world. This membrane is similar structurally to that of the eukaryotes.

A special membranous structure is the mesosome, which is formed by the extensions of plasma membrane into the cell. These extensions are in the form of vesicles, tubules and lamellae. They help in cell wall formation, DNA replication and distribution to daughter cells. They also help in respiration, secretion processes, to increase the surface area of the plasma membrane and enzymatic content. In some prokaryotes like cyanobacteria, there are other membranous extensions into the cytoplasm called chromatophores that contain pigments.

Bacterial cells may be motile or non-motile. If motile, they have thin filamentous extensions from their cell wall called flagella. Bacteria show a range in the number and arrangement of flagella. Bacterial flagellum is composed of three parts - filament, hook and basal body. The filament is the longest portion and extends from the cell surface to the outside.

Besides flagella, Pili and Fimbriae are also surface structures of the bacteria but do not play a role in motility. The pili are elongated tubular structures made of a special protein. The fimbriae are small bristle like fibres sprouting out of the cell. In some bacteria, they are known to help attach the bacteria to rocks in streams and also to the host tissues.

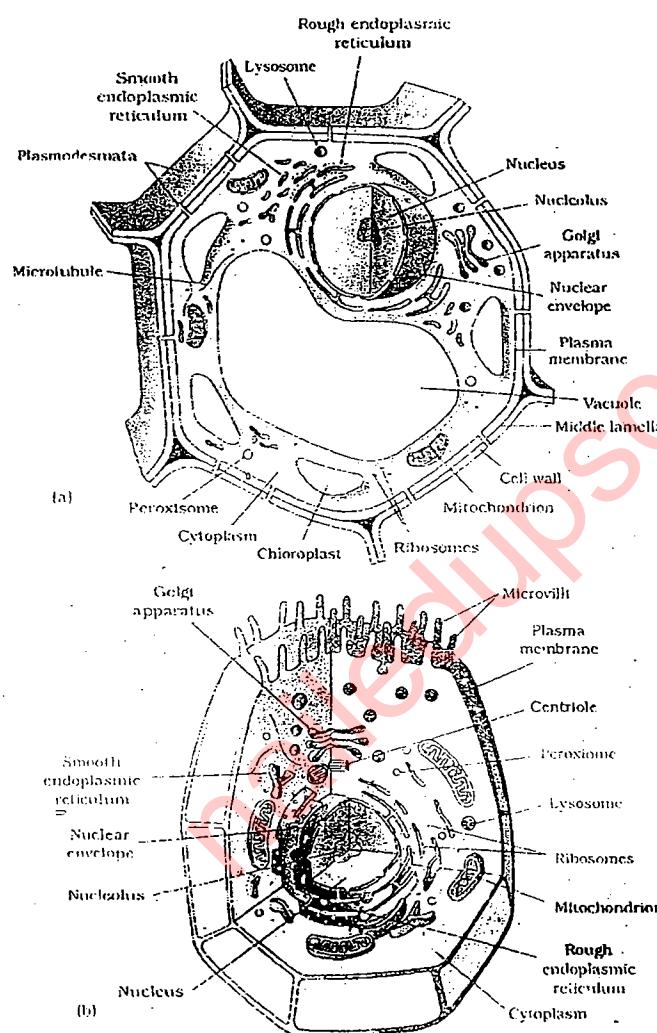
Ribosomes and Inclusion Bodies

In prokaryotes, ribosomes are associated with the plasma membrane of the cell. They are about 15 nm by 20 nm in size and are made of two subunits - 50S and 30S units which when present together form 70S prokaryotic ribosomes. Ribosomes are the site of protein synthesis. Several ribosomes may attach to a single mRNA and form a chain called polyribosomes or polysome. The ribosomes of a polysome translate the mRNA into proteins.

Inclusion bodies: Reserve material in prokaryotic cells is stored in the cytoplasm in the form of inclusion bodies. These are not bounded by any membrane system and lie free in the cytoplasm, e.g., phosphate granules, cyanophycean granules and glycogen granules. Gas vacuoles are found in blue green and purple and green photosynthetic bacteria.

Eukaryotic Cells

The eukaryotes include all the protists, plants, animals and fungi. In eukaryotic cells there is an extensive compartmentalization of cytoplasm through the presence of membrane bound organelles. Eukaryotic cells possess an organized nucleus with a nuclear envelope. In addition, eukaryotic cells have a variety of complex locomotory and cytoskeletal structures. Their genetic material is organized into chromosomes. All eukaryotic cells are not identical. Plant and animal cells are different as the former possess cell walls, plastids and a large central vacuole that are absent in animal cells. On the other hand, animal cells have centrioles that are absent in almost all plant cells.



① Cell Membrane

The detailed structure of the membrane was studied only after the advent of the electron microscope in the 1950s. Meanwhile, chemical studies on the cell membrane, especially in human red blood cells (RBCs), enabled the scientists to deduce the possible structure of plasma membrane. The membrane possesses lipids, proteins and carbohydrates. According to the Fluid Mosaic Model given by Singer and Nicolson, the lipids molecules, which are in a quasi-fluid nature, enables lateral movement of protein molecules. The fluid nature of the membrane is also important from the point of view of functions like cell growth, formation of intercellular junctions, secretion, endocytosis, cell division etc. One of the most important functions of the plasma membrane is the transport of the molecules across it.

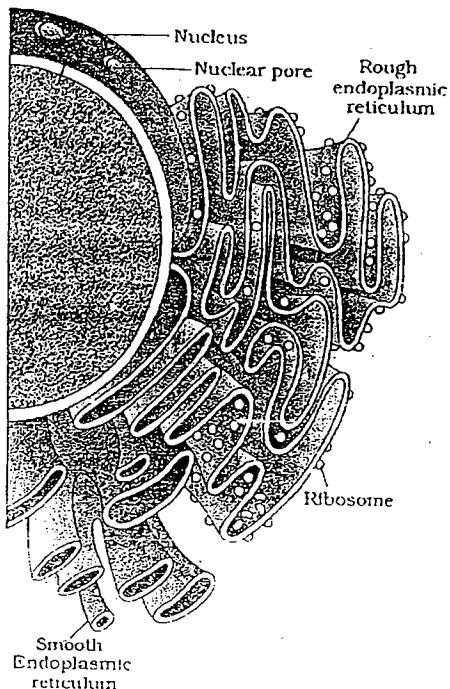
② Cell Wall

A non-living rigid structure called the cell wall forms an outer covering for the plasma membrane of fungi and plants. Cell wall not only gives shape to the cell and protects the cell from mechanical damage and infection, it also helps in cell-to-cell interaction and provides barrier to undesirable macromolecules. Algae have cell wall, made of cellulose, galactans, mannans and minerals like calcium carbonate, while in other plants it consists of cellulose, hemicellulose, pectins and proteins. The cell wall of a young plant cell, the primary wall is capable of growth, which gradually diminishes as the cell matures and the secondary wall is formed on the inner (towards membrane) side of the cell. The middle lamella is a layer mainly of

Anthropology Paper 01 - Volume 01

calcium pectate that holds or glues the different neighboring cells together. The cell wall and middle lamellae may be traversed by plasmodesmata which connect the cytoplasm of neighboring cells.

(ii) Endomembrane System



While each of the membranous organelles is distinct in terms of its structure and function, many of these are considered together as an endomembrane system because their functions are coordinated. The endomembrane system include endoplasmic reticulum (ER), golgi complex, lysosomes and vacuoles. Since the functions of the mitochondria, chloroplast and peroxisomes are not coordinated with the above components, these are not considered as part of the endomembrane system.

(i) The Endoplasmic Reticulum (ER)

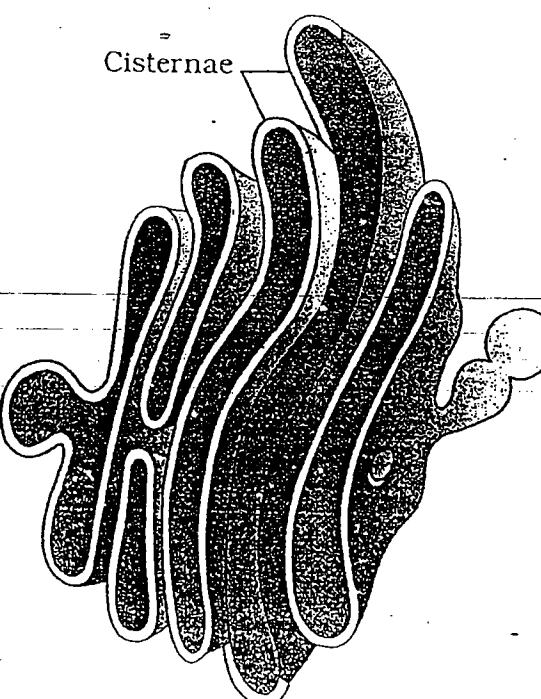
Electron microscopic studies of eukaryotic cells reveal the presence of a network or reticulum of tiny tubular structures scattered in the cytoplasm that is called the endoplasmic reticulum (ER). Hence, ER divides the intracellular space into two distinct compartments, i.e., luminal (inside ER) and extra luminal (cytoplasm) compartments.

The ER often shows ribosomes attached to their outer surface. The endoplasmic reticulum bearing ribosomes on their surface is called rough endoplasmic reticulum (RER). In the absence of ribosomes they appear smooth and are called smooth endoplasmic reticulum (SER). RER is frequently continuous with the outer membrane of the nucleus. The smooth endoplasmic reticulum is the major site for synthesis of lipid. In animal cells lipid-like steroid hormones are synthesised in SER.

(ii) Golgi Apparatus

Camillo Golgi (1898) first observed densely stained reticular structures near the nucleus. These were later named Golgi bodies after him. They consist of many flat, disc-shaped sacs or cisternae of $0.5\mu\text{m}$ to $1.0\mu\text{m}$ diameter (Figure 8.6). These are stacked parallel to each other. Varied number of cisternae is present in a Golgi complex. The Golgi cisternae are concentrically arranged near the nucleus with distinct convex cis or the forming face and concave trans or the maturing face.

The cis and the trans faces of the organelle are entirely different, but interconnected. The golgi apparatus principally performs the function of packaging materials, to be delivered either to the intra-cellular targets or secreted outside the cell. Materials to be packaged in the form of vesicles from the ER fuse with the cis face of the golgi apparatus and move towards the maturing face.



Anthropology Paper 01 - Volume 01

This explains, why the golgi apparatus remains in close association with the endoplasmic reticulum. A number of proteins synthesized by ribosomes on the endoplasmic reticulum are modified in the cisternae of the golgi apparatus before they are released from its trans face. Golgi apparatus is the important site of formation of glycoproteins and glycolipids.

(ii) Lysosomes

These are membrane bound vesicular structures formed by the process of packaging in the golgi apparatus. The isolated lysosomal vesicles have been found to be very rich in almost all types of hydrolytic enzymes (hydrolases - lipases, proteases, carbohydrases) optimally active at the acidic pH. These enzymes are capable of digesting carbohydrates, proteins, lipids and nucleic acids.

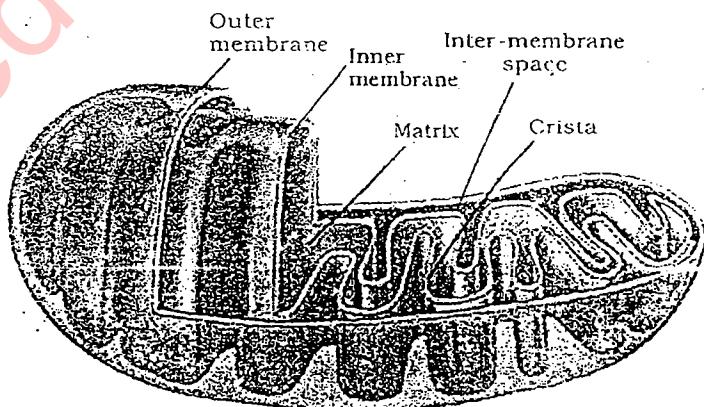
(iv) Vacuoles

The vacuole is the membrane-bound space found in the cytoplasm. It contains water, sap, excretory product and other materials not useful for the cell. The vacuole is bound by a single membrane called tonoplast. In plant cells the vacuoles can occupy up to 90 per cent of the volume of the cell. In plants, the tonoplast facilitates the transport of a number of ions and other materials against concentration gradients into the vacuole, hence their concentration is significantly higher in the vacuole than in the cytoplasm. In Amoeba the contractile vacuole is important for excretion. In many cells, as in protists, food vacuoles are formed by engulfing the food particles.

(A) Mitochondria

Mitochondria (sing.: mitochondrion), unless specifically stained, are not easily visible under the microscope. The number of mitochondria per cell is variable depending on the physiological activity of the cells. In terms of shape and size also, considerable degree of variability is observed. Typically it is sausage-shaped or cylindrical having a diameter of 0.2-1.0 μm (average 0.5 μm) and length 1.0-4.1 μm .

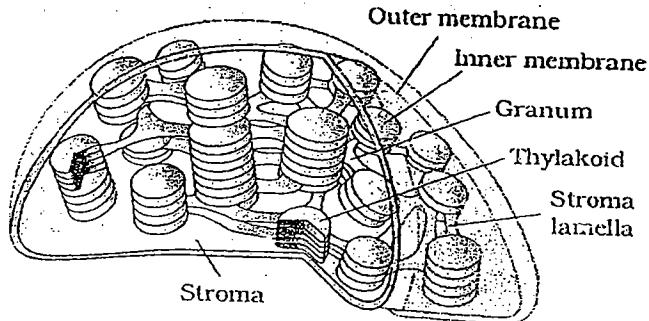
Each mitochondrion is a double membrane-bound structure with the outer membrane and the inner membrane dividing its lumen distinctly into two aqueous compartments, i.e., the outer compartment and the inner compartment. The inner compartment is called the matrix. The outer membrane forms the continuous limiting boundary of the organelle. The inner membrane forms a number of infoldings called the cristae (sing.: crista) towards the matrix. The cristae increase the surface area. The two membranes have their own specific enzymes associated with the mitochondrial function. Mitochondria are the sites of aerobic respiration. They produce cellular energy in the form of ATP, hence they are called 'power houses' of the cell. The matrix also possesses single circular DNA molecule, a few RNA molecules, ribosomes (70S) and the components required for the synthesis of proteins. The mitochondria divide by fission.



(S) Plastids

Plastids are found in all plant cells and in euglenoids. These are easily observed under the microscope as they are large. They bear some specific pigments, thus imparting specific colours to the plants. Based on the type of pigments plastids can be classified into chloroplasts, chromoplasts and leucoplasts.

The chloroplasts contain chlorophyll and carotenoid pigments which are responsible for trapping light energy essential for photosynthesis. In the chromoplasts fat soluble carotenoid pigments like carotene, xanthophylls and others are present. This gives the part of the plant a yellow, orange or red colour. The leucoplasts are the colourless plastids of varied shapes and sizes with stored nutrients: Amyloplasts store carbohydrates (starch), e.g., potato; elaioplasts store oils and fats whereas the aleuroplasts store proteins.



Majority of the chloroplasts of the green plants are found in the mesophyll cells of the leaves. These are lens-shaped, oval, spherical, discoid or even ribbon-like organelles having variable length (5-10mm) and width (2-4mm). Their number varies from 1 per cell of the Chlamydomonas, a green alga to 20-40 per cell in the mesophyll.

Like mitochondria, the chloroplasts are also double membrane bound. Of the two, the inner chloroplast membrane is relatively less permeable. The space limited by the inner membrane of the chloroplast is called the stroma. A number of organised flattened membranous sacs called the thylakoids, are present in the stroma. Thylakoids are arranged in stacks like the piles of coins called grana (singular: granum) or the intergranal thylakoids. In addition, there are flat membranous tubules called the stroma lamellae connecting the thylakoids of the different grana. The membrane of the thylakoids encloses a space called a lumen. The stroma of the chloroplast contains enzymes required for the synthesis of carbohydrates and proteins. It also contains small, double-stranded circular DNA molecules and ribosomes. Chlorophyll pigments are present in the thylakoids. The ribosomes of the chloroplasts are smaller (70S) than the cytoplasmic ribosomes (80S).

(6) **Ribosomes** In prokaryotes, they are associated with plasma membrane of cell. They are sites of protein synthesis. Several ribosomes attach to single RNA to form polyribosome (or) polysome. Ribosomes are the granular structures first observed under the electron microscope as dense particles by George Palade (1953). They are composed of ribonucleic acid (RNA) and proteins and are not surrounded by any membrane. The eukaryotic ribosomes are 80S while the prokaryotic ribosomes are 70S. Here 'S' stands for the sedimentation coefficient; it indirectly is a measure of density and size. Both 70S and 80S ribosomes are composed of two subunits.

Cytoskeleton

An elaborate network of filamentous proteinaceous structures present in the cytoplasm is collectively referred to as the cytoskeleton. The cytoskeleton in a cell are involved in many functions such as mechanical support, motility, maintenance of the shape of the cell.

Cilia and Flagella

Cilia (sing.: cilium) and flagella (sing.: flagellum) are hair-like outgrowths of the cell membrane. Cilia are small structures, which work like oars, causing the movement of either the cell or the surrounding fluid. Flagella are comparatively longer and responsible for cell movement. The prokaryotic bacteria also possess flagella but these are structurally different from that of the eukaryotic flagella.

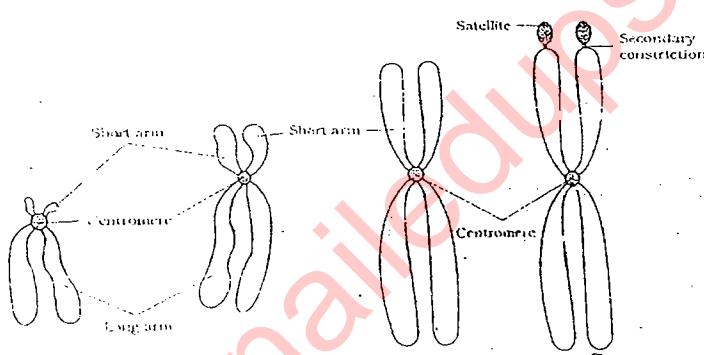
(7) Centrosome and Centriole

Centrosome is an organelle usually containing two cylindrical structures called centrioles. The centrioles form the basal body of cilia or flagella, and spindle fibres that give rise to spindle apparatus during cell division in animal cells.

8 Nucleus

Nucleus as a cell organelle was first described by Robert Brown as early as 1831. Later the material of the nucleus stained by the basic dyes was given the name chromatin by Flemming. The interphase nucleus (nucleus of a cell when it is not dividing) has highly extended and elaborate nucleoprotein fibres called chromatin, nuclear matrix and one or more spherical bodies called nucleoli (sing.: nucleolus). Electron microscopy has revealed that the nuclear envelope, which consists of two parallel membranes with a space between (10 to 50 nm) called the perinuclear space, forms a barrier between the materials present inside the nucleus and that of the cytoplasm. The outer membrane usually remains continuous with the endoplasmic reticulum and also bears ribosomes on it. At a number of places the nuclear envelope is interrupted by minute pores, which are formed by the fusion of its two membranes. These nuclear pores are the passages through which movement of RNA and protein molecules takes place in both directions between the nucleus and the cytoplasm. The nuclear matrix or the nucleoplasm contains nucleolus and chromatin. The nucleoli are spherical structures present in the nucleoplasm. The content of nucleolus is continuous with the rest of the nucleoplasm as it is not a membrane bound structure. It is a site for active ribosomal RNA synthesis. Larger and more numerous nucleoli are present in cells actively carrying out protein synthesis.

During different stages of cell division, cells show structured chromosomes in place of the nucleus. Chromatin contains DNA and some basic proteins called histones, some non-histone proteins and also RNA. A single human cell has approximately two-meter long thread of DNA distributed among its forty six (twenty three pairs) chromosomes. Every chromosome essentially has a primary constriction or the centromere on the sides of which disc shaped structures called kinetochores are present.



one very long arm, whereas the telocentric chromosome has a terminal centromere.

Microbodies

Many membrane bound minute vesicles called microbodies that contain various enzymes, are present in both plant and animal cells.

DNA STRUCTURE (Watson & Crick)

DNA, The Genetic Material

Several lines of indirect evidence have long suggested that DNA contains the genetic information of living organisms. Most important, results obtained using several different experimental procedures showed that most of the DNA is located in the chromosomes, whereas RNA and proteins are also abundant in the cytoplasm. Moreover, a precise correlation exists between the amount of DNA per cell and the number of sets of chromosomes per cells. That is, most somatic cells of diploid organisms, for example, contain exactly twice the amount of DNA as the haploid germ cells or gametes of the same species. Finally, the molecular composition of the DNA in all of the different cells of an organism is the same (with rare

Based on the position of the centromere, the chromosomes can be classified into four types. The metacentric chromosome has middle centromere forming two equal arms of the chromosome. The sub-metacentric chromosome has centromere nearer to one end of the chromosome resulting into one shorter arm and one longer arm. In case of acrocentric chromosome the centromere is situated close to its end forming one extremely short and

Anthropology Paper 01 - Volume 01

exceptions), whereas the composition of RNA and proteins varies both qualitatively and quantitatively from one cell type to another.

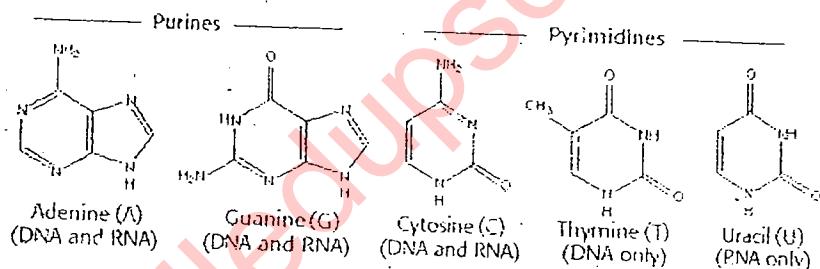
Although these correlations strongly suggest that DNA is the genetic material, they by no means prove it. Fortunately, direct evidence has established that the genetic information is encoded in DNA. Noteworthy of these experiments are those conducted by Frederick Griffith in 1928 and O.T. Avery, C.M. Macleod and M. McCarty in 1944. A.D. Hershey and M. Chase published additional direct evidence indicating that DNA is the genetic material in 1952.

Structure of DNA

The genetic information of all living organisms, except the RNA Viruses, is stored in DNA and in what form is the genetic information stored? What features of the structure of DNA allow for the transmission of genetic information from generation to generation?

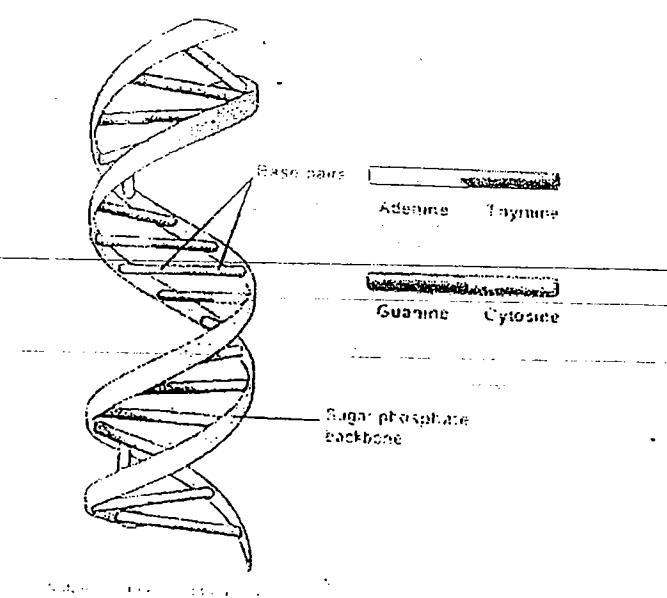
Nucleic Acids are macromolecules composed of repeating subunits called nucleotides. Each nucleotide is composed of

1. A Phosphate group
2. A Five-carbon sugar (or pentose)
3. A cyclic nitrogen-containing compound called a base.



In DNA, the sugar is 2-deoxyribose (thus the name deoxyribonucleic acid); in RNA, the sugar is ribose (thus ribonucleic acid). There are four different bases commonly found in DNA: adenine, guanine, thymine, and cytosine. RNA also usually contains adenine, guanine and cytosine, but has a different base, uracil, in the place of thymine.

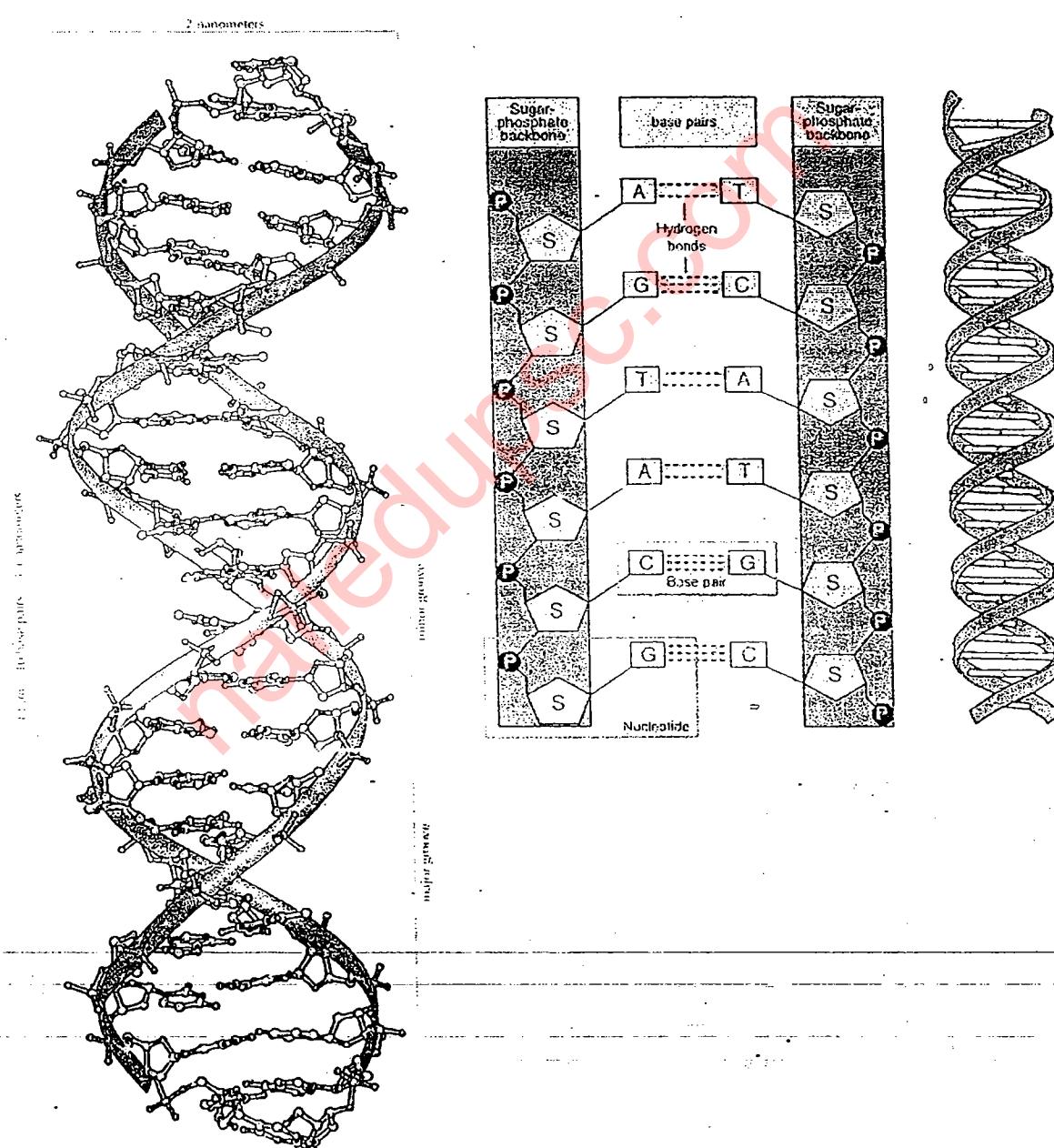
Adenine and guanine are double-ring bases called purines; cytosine, thymine and uracil are single-ring bases called pyrimidines. Both DNA and RNA, therefore, contain four different subunits or nucleotides, two purine nucleotides, and two pyrimidine nucleotides. RNA usually exists as a single stranded polymer that is composed of a long sequence of nucleotides. DNA, however, has one very important additional level of organization; it is usually a double-stranded molecule.



The Watson and Crick DNA Double Helix

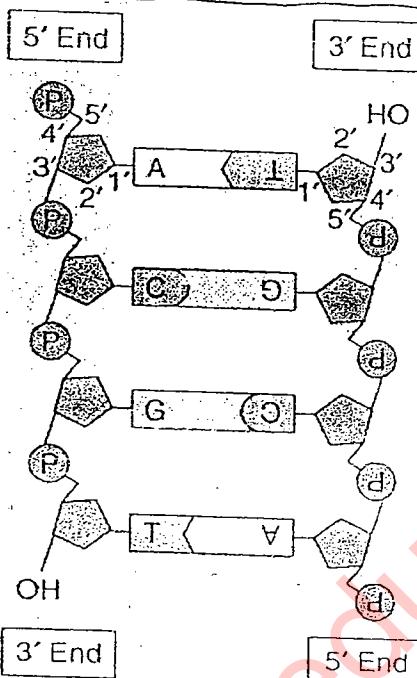
The correct structure of DNA was first deduced by J.D. Watson and F.H.C. Crick in 1953. They proposed that DNA exists as a double helix in which the two polynucleotide chains are coiled about one another in a spiral. Each polynucleotide chain consists of a sequence of nucleotides linked together by phosphodiester bonds, joining adjacent deoxyribose moieties.

3



Anthropology Paper 01 - Volume 01

- H The two polynucleotide strands are held together in their helical configuration by hydrogen bonding between bases in opposing strands, the resulting base-pairs being stacked between the two chains perpendicular to the axis of the molecule like the steps of a spiral staircase. The base pairing is specific; adenine is always paired with thymine, and guanine is always paired with cytosine. Thus, all base-pairs consist of one purine and one pyrimidine. The specificity of base-pairing results from the hydrogen-bonding capacities of the bases in their normal configurations. In their most common structural configurations, adenine and thymine form two hydrogen bonds, and guanine and cytosine form three



Copyright © 2001 Benjamin Cummings, an Imprint of Addison Wesley Longman Inc.

hydrogen bonds. Analogous hydrogen bonding between cytosine and adenine, for example, is not possible except when they exist in their rare structural states (when mutations occur).

Once the sequence of bases in one strand of DNA double helix is known, the sequence of bases in the other strand is also known because of the specific base-pairing. The two strands of a DNA double helix are thus said to be complementary (not identical). It is this property, complementarity of two strands, that make DNA uniquely suited to store and transmit genetic information (we shall discuss this in the next topic of DNA replication).

The base pairs in DNA are stacked 3.4 nanometers apart with 10 base-pairs per turn (360°) of the double helix. The sugar-phosphate backbones of the two complementary strands are antiparallel; that is they have opposite chemical

polarity. As one moves unidirectionally along a DNA double helix, the phosphodiester bonds in one strand go from a 3' carbon of one nucleotide to a 5' carbon of the adjacent nucleotide, whereas those in the complementary strand go from a 5' carbon to a 3' carbon. This opposite polarity of the complementary strands is very important in considering the mechanism of replication of DNA.

DNA REPLICATION

Living organisms perpetuate their kind through reproduction. This may be simple duplication (cell fission) as in bacteria or complex modes of sexual reproduction as in higher plants and animals. IN all cases, however, reproduction entails the faithful transmission of the genetic information of the parents to the progeny. Since the genetic information is stored in the DNA, the replication of DNA is central of all of biology.

Significance of Specific Base Pairing in DNA Replication

One question whose answer was immediately suggested by the double helix was the manner in which gene duplication occurs so precisely in cell division. Millions of cells undergo mitosis each day in complex organisms like humans, for the most part resulting in cells exactly identical to each other. The precision involved has long fascinated biologists. We now know this precision is the function of nitrogenous bases.

- Unwinding ① helicase enzyme
Unwinding/Terminating ② Ligase
③ RNA primase - will produce a primer - necessary for protein synthesis
④ DNA polymerase 3 - helps in bringing corresponding nucleotide bases to the site of attachment

G.S. Kartic (karticsg@gmail.com)

⑤ Topoisomerase - will put a knot at a particular place to prevent unwinding of entire DNA molecule at once

① Dispersive Replication

- 2 strands of DNA break randomly
- Replicate
- Recombine to form daughter DNA molecules
- Mix of old & new nucleotide s scattered along chain = hybrids
- Mechanism not accepted

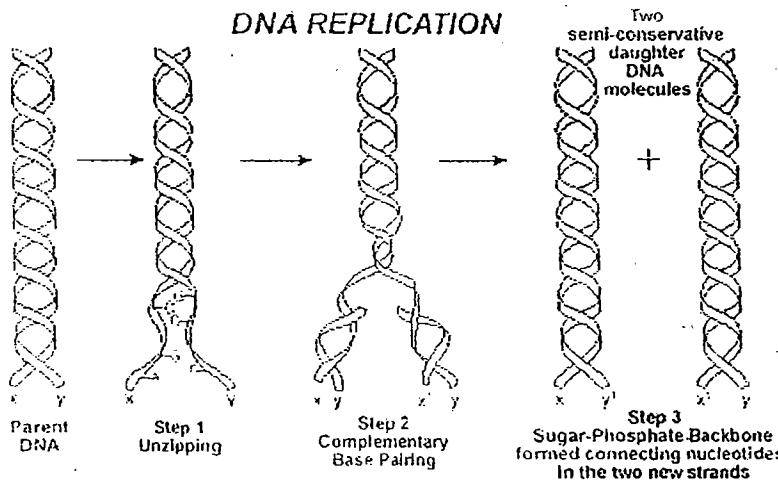
② Conservative Replication

- After replication
- One daughter DNA contains original 2 strands of parent DNA.
- while other daughter contains 2 newly synthesised strands
- Method not accepted.

③ Semi-conservative Replication (Watson - Crick)

- Cof. of specificity of base pairing
- Half of DNA is conserved i.e., only one strand is synthesised & other half of original DNA is retained

Anthropology Paper 01 - Volume 01



was discovered, biochemists knew that the amount of A always equaled the amount of T in the DNA of any organism, and the amount of C always equaled the amount of G. With the clarification of the molecular nature of DNA, the reasons for this phenomenon and for the precision of duplication of genes became apparent.

The consistency of the equality $C + T = A + G$ is a function of the size of the bases, the space available between the sugar molecules in the double helix, and the chemical nature of these bases. The general shapes of the four nitrogenous bases are given earlier. As we have seen earlier, because of their chemical structures, A and G are classified as purine bases and C and T are pyrimidine bases. As you can see, purines are larger molecules than pyrimidines. Within the diameter of the DNA helix, only purine-pyrimidine pairing can occur; purine-purine would be too large to fit into the helix and pyrimidine-pyrimidine pairing would be too small. In addition, certain details of chemical structure of the bases, which we need not go into, allow linkage only of A with T and of C with G. This is known as specificity of base pairing. Because of specific base pairing, the strands of DNA are referred to as being complementary to each other in their base sequences.

Experiments indicate that when a cell is preparing to undergo division, the double helix within each linear chromosome unwinds in a progressive manner from one end. An enzyme has been found which causes the hydrogen bonds holding the bases together to break, resulting in single polynucleotide strands with the bases exposed. From the nucleoplasm, new molecules of the bases are bonded to the exposed bases. Because of the specificity of base-pairing, the original partners of the exposed bases are replaced by new but chemically identical molecules. Enzymes then cause the joining of the nucleotides into a chainlike molecule.

Each of the two new strands of polynucleotides will be the complement of its partner strand, and each will be identical to the original partners. The end results are two double helices that are exactly alike. They will separate in mitosis into daughter cells, which will therefore be genetically identical.

In higher organisms, cells contain chromosome pairs rather than the single strand of DNA found in bacteria, and each chromosome consists of a double helix of DNA. During mitosis and meiosis, one of the double helices resulting from the synthesis described above will be in each of the sister chromatids. For this reason the sister chromatids may be considered genetically identical, barring events such as crossing over. Just as all chemical reactions that occur in a cell are under the control of enzymes, so are all the steps involved in the duplication of DNA, which is referred to as replication. This type of duplication, in which the resulting double helices consist of one old and one new strand, is frequently referred to as semiconservative replication.

PROTEIN SYNTHESIS

Prior to the discovery of the double helix, some definite ideas had already been formed about the actual function of a gene. An essential class of macromolecules called proteins contributes to the structure of the cell and, in the form of enzymes, determines the metabolic reactions of a cell. In other words, the structure and function of a cell – which are actually its phenotype – are determined in great part by the proteins in the cell.

Based on experimentation in the year 1941, G. Beadle and E. Tatum have come out with the famous "One Gene One Enzyme" Hypothesis. They felt that there is a definite relationship between genes and those vital proteins that control metabolic reactions, enzymes:

"The development and functioning of an organism consists essentially of an integrated system of chemical reactions controlled in some manner by genes. It is entirely tenable to suppose that these genes which are themselves a part of the system, control or regulate specific reactions in the system either by acting directly as enzymes or by determining the specificities of enzymes."

In human, the relationship between genes and enzymes was discovered many decades before Beadle and Tatum's work. In 1901, a British physician, Sir Archibald Garrod, was studying a condition called alkaptonuria. Mendel's laws were just receiving their due attention in the scientific world at the time. Garrod noted that several patients suffering from the disease were offspring of consanguineous marriages. With the help of classical geneticists, Garrod concluded that alkaptonuria was a heritable disease, which was determined by a recessive gene.

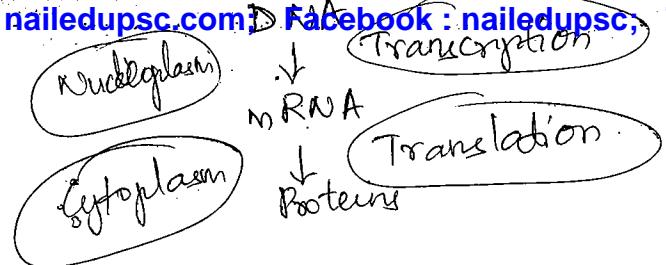
Further study showed a number of heritable diseases that seemed to result from metabolic disorders, and so in 1908 Garrod published a book called The Inborn Errors of Metabolism, in which he linked these biochemical defects with genes. Since that time over 100 conditions have been shown to be due to either the deficiency or absence of specific enzymes.

Fortunately, a few of these conditions can be treated after detection. For example, a homozygous condition, phenylketonuria (PKU) exists in which the enzyme for the breakdown of an amino acid phenylalanine is missing. Undetected, PKU results in severe mental retardation and other defects. However, if the condition is detected in a homozygous baby, the mental retardation can be avoided by simply eliminating excess phenylalanine from the baby's diet. In other disorders, such as albinism, cures are not yet possible.

The Mechanism of Protein Synthesis

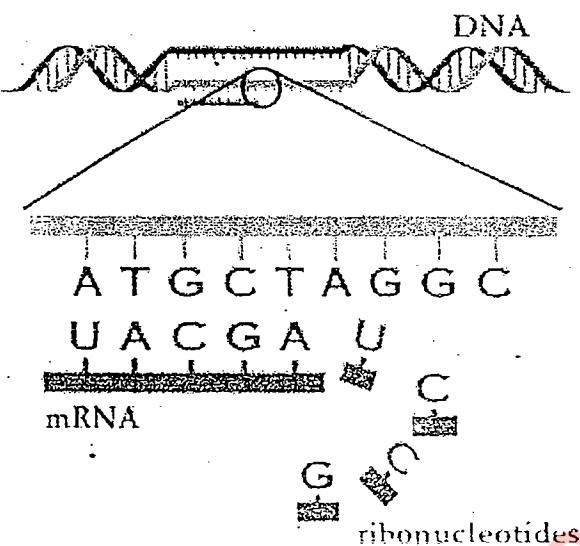
In attempting to discern the mechanism by which genes determine the production of enzymes and other proteins in a cell, biologists had to reflect on the fact that the synthesis of proteins generally occurs in the cytoplasm of the cell. The genetic information for the synthesis, however, resides in the DNA, which in higher organisms like the human beings remains in the nucleus, being bound up in the chromosomes. Thus, it appeared likely to scientists attempting to understand gene function that if genes remain in the nucleus, there must be some form of communication between the DNA and cytoplasmic factors involved in protein synthesis.

Evidence of a channel of communication between the nucleus and cytoplasm came from various areas of biology. Experiments in this context revealed that some particles leave the nucleus by traversing the nuclear membrane to enter the cytoplasm. The high magnification of powerful electron microscopes showed that the nuclear membrane is actually full of tiny pores through which material can pass.



Messenger Molecules for the Gene: Transcription

Transcription



acid (mRNA) was obtained from studies that confirmed that RNA molecules do move from the nucleus to the cytoplasm.

- 3 mRNA is formed when a particular segment of DNA - that is, a gene - becomes active. IN a manner similar to the replication of DNA during cell division, an active gene serves as the template for the formation of a piece of RNA, which then contains a sequence of bases that is the complement of one of the strands of DNA and identical to the other strand of DNA. Each sequence of three bases on the mRNA is called a codon. (We shall discuss later why the codon is composed of a sequence of only three bases, no more or less). The process of copying an RNA strand from a DNA template is known as transcription.
- 4 which determines uniqueness of each protein
- 5 Usually only one strand of the DNA helix serves as a template for transcription.

Processing of mRNA

- In eukaryotes, a number of chemical changes in the mRNA must take place following transcription before it is released into the cytoplasm. One of these changes is known as capping, during which the beginning of the mRNA chain is altered in a particular way. A part of this process involves the addition of methyl (CH_3) groups at one end and a addition of a number of adenines are added to the other end of the mRNA.

The functions of these particular chemical changes are still under study. Some scientists have proposed that they may be necessary in order for the mRNA to enter the cytoplasm, and that once they have occurred, they protect the mRNA from cytoplasmic enzymes which might degrade the RNA. Yet others propose that the caps and multiple adenine sequences (also known as poly-A) may serve to bind mRNA to other cytoplasmic factors involved in protein synthesis.

- Some recent observations have revealed another fascinating aspect of mRNA processing. Technological advances have enabled molecular geneticists to determine every base of certain genes, and also of mRNA molecules transcribed from these genes. It was discovered that mRNA of a particular gene that is newly transcribed (i.e. still in the nucleus) has more bases than the mature mRNA of the gene found in the cytoplasm.

Capping

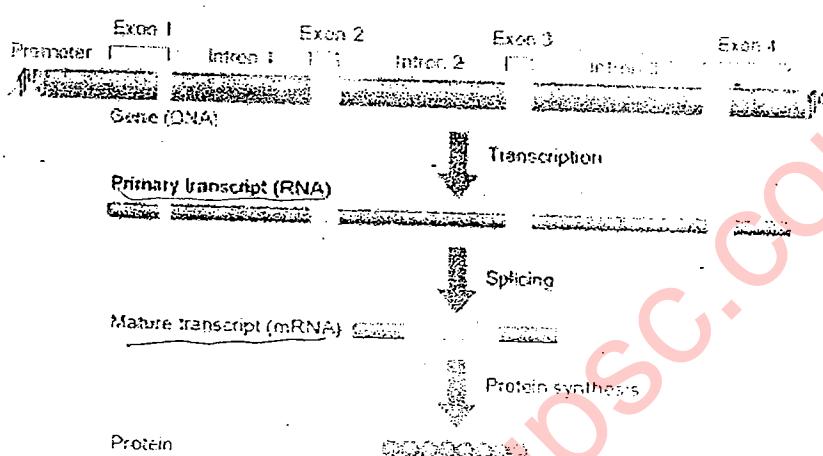
excised

Anthropology Paper 01 - Volume 01

excised

As more reports of discrepancies between the number of bases in mature mRNA and newly transcribed RNA, or the corresponding DNA, appeared, scientists realized that portions of the DNA transcribed into mRNA are actually removed, or excised, from the messenger molecule before it leaves the nucleus to take part in protein synthesis. Using a number of different techniques, scientists confirmed that this phenomenon occurred in cells of various eukaryotic organisms and some viruses. For example, these mRNA have been found in the genes for insulin, and hemoglobin, in mammals. A gene that determines Alpha-2 Collagen (a component of cartilage) is known to be over 50,000 bases long; yet its mature mRNA has fewer than 5,000 bases. No less than 50 regions of the newly transcribed collagen mRNA are removed.

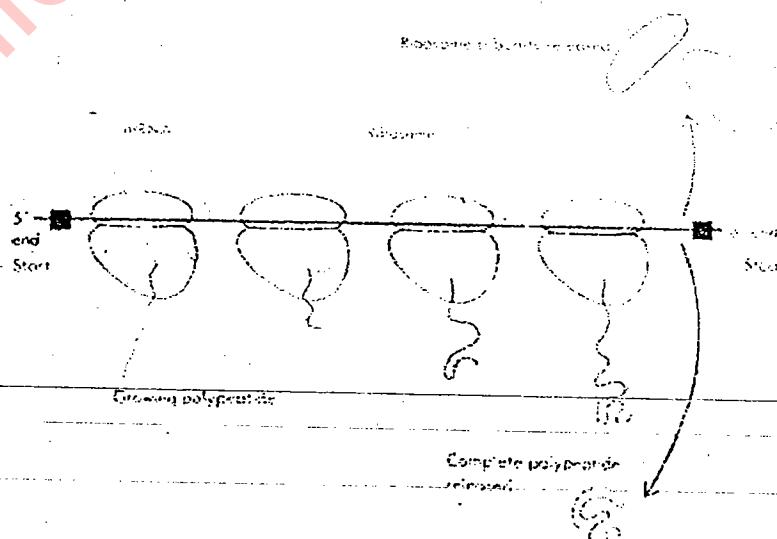
Structure of a Gene



The terminology, which has been most commonly used for a sequence of DNA that is transcribed but excised from the messenger molecule, is **intron**, and **exon** for the sequences that are retained. There is some evidence that their presence and excision are involved with the presence of a nuclear membrane and perhaps, with the movement of mRNAs from the nucleus into the cytoplasm. Since the

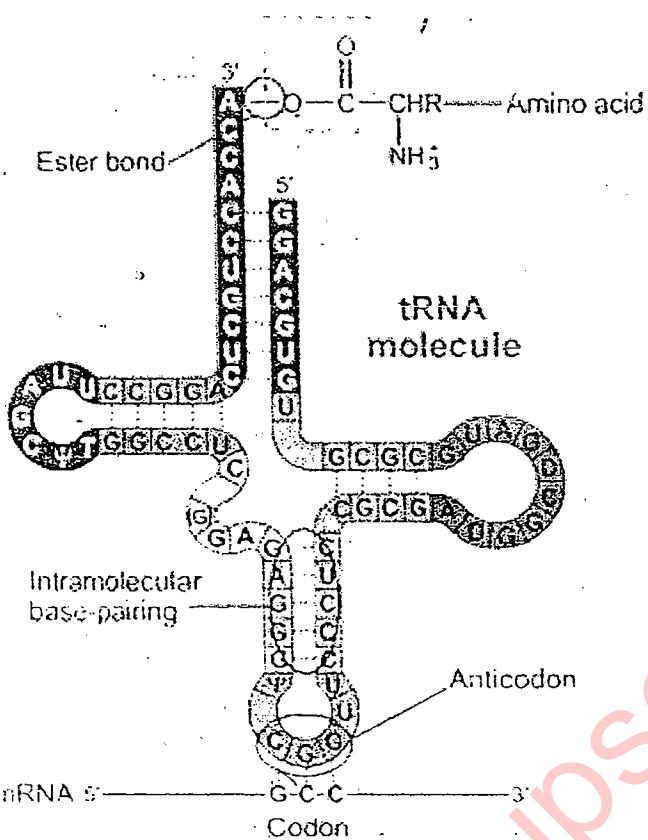
mRNA precursor molecules found in nuclei are in various stages of processing, the population of these nuclear molecules is very heterogeneous. We refer to them as **heterogeneous nuclear RNA**, or hnRNA.

It is fascinating to contemplate the controls that must exist in cells of eukaryotes over the processing of mRNAs. How do enzymes that cut the mRNA molecule recognize the boundaries of introns from exons? After the introns are removed, how are the remaining pieces then spliced together in correct order? There is evidence that introns are excised in sequence. How is this controlled? The process in the above figure summarizes the above aspects of mRNA processing.



- ① Activation of Amino acids ($tRNA + \text{Amino acid} \rightarrow \text{charged tRNA}$)
- ② Formation of Initiation Complex (under presence of Initiating factors IF_{1,2,3})
- ③ Elongation of peptide chain
- ④ Termination of Synthesis

Anthropology Paper 01 - Volume 01



Translation of the Genetic Message

Once the mRNA has been transcribed and processed in eukaryotic cells, it then leaves the nucleus and becomes attached to ribosome particles in the cytoplasm.

Ribosomes: Ribosomes have been found to contain RNA (referred to as rRNA) and protein as well, and because they are the sites of protein synthesis in a cell, they have sometimes been called the "factories" of a cell. The figure shows diagrammatically the relationship between an mRNA strand and a group of ribosomes, often called polyribosomes or polysomes.

Ribosomes are actually very complex organelles of the cell. The rRNA is transcribed directly from the DNA, as is mRNA. Other genes determining ribosomal proteins are transcribed to give mRNAs. The messages enter the cytoplasm, and the proteins are synthesized. After the synthesis, newly synthesized ribosomal proteins are believed to reenter the nucleus to bind

with the rRNAs. The organization of proteins and rRNA into ribosomal particles usually occurs around the areas of DNA that specify rRNA. The resulting clump of molecules forms a structure called a nucleolus as the term implies, nucleoli are found only in the nucleus. Therefore, they are present only in eukaryotic cells. In bacteria, ribosomes are formed and released into the surrounding cytoplasm.

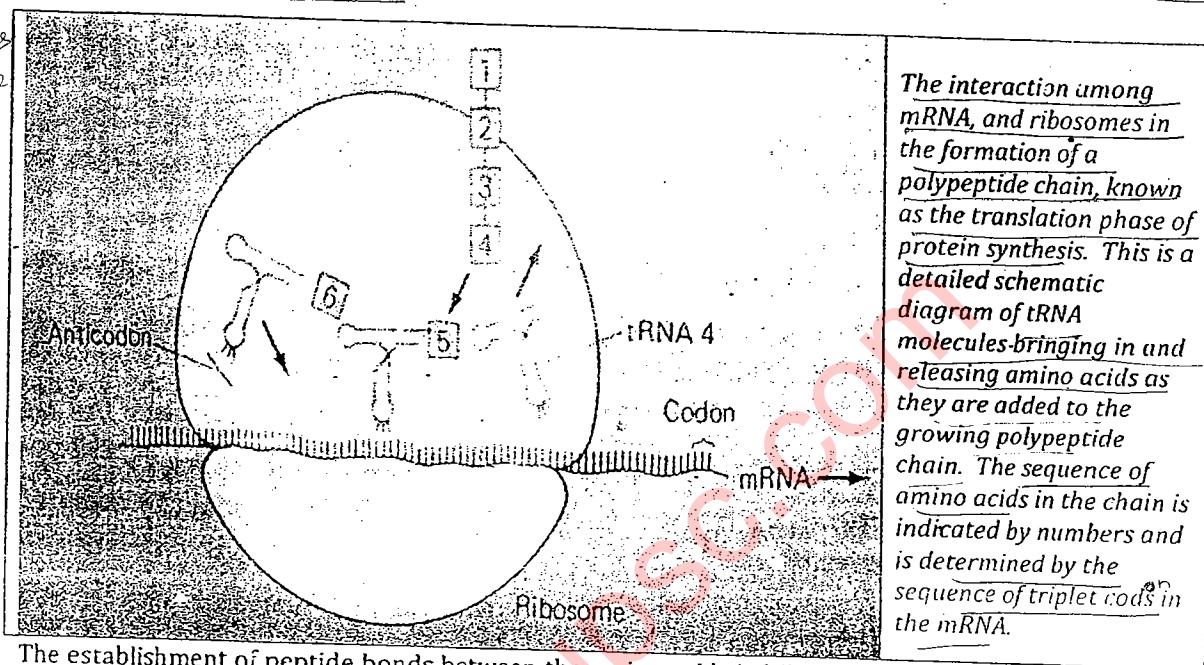
tRNA: In the cytoplasm there is yet another class of DNA-determined RNA molecules which become involved in the process of protein synthesis when mRNA attaches to polysomes. These molecules, referred to either as soluble RNA (sRNA) or, more commonly as transfer RNA (tRNA) are quite different in form and function from mRNA. Recent evidence has indicated that the tRNA molecule is a very interesting one, featuring segments, which exist as double-stranded nucleic acid, while other regions are single-stranded. The double-stranded regions are not composed of two separate strands as in DNA; but indicate areas of complementary bases in different parts of the tRNA molecule that fold over and base pair. This results in a folded structure with a shape that sometimes resembles a cloverleaf.

There is evidence that after the tRNA is transcribed from DNA, some chemical changes and processing also occur. There is also modification of some of the bases, such as the addition of methyl groups. One end of all tRNA molecules contains the sequence CCA.

tRNA has other unique features: it is joined at the CCA end to a single molecule of amino acid, and at the apex of one of the loops found in tRNA there is a short sequence of bases (called the anticodon) that is the source of attraction between the tRNA and the mRNA. tRNA that has a sequence of bases at the loop complementary to a sequence on the mRNA forms a bond with the messenger similar to the bonding between the double strands of the DNA helix. The two other loops are believed to be the sites of attachment of the tRNA to the ribosome, and of the enzyme catalyzing the acceptance of an amino acid by the tRNA.

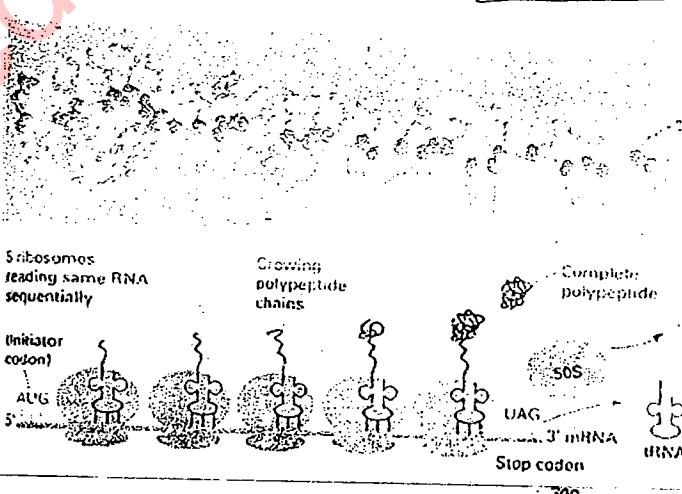
Anthropology Paper 01 - Volume 01

Several tRNA molecules become attached to the long messenger, and they bring their amino acids with them. The result of this interaction between mRNA and tRNA is progressively lengthening series of amino acid molecules lined up next to one another. This interaction is a gene-determined protein synthesis known as translation.



The establishment of peptide bonds between the amino acids is followed by the enzymatic release of the amino acids from the tRNA, resulting in the formation of a chain of amino acids. This chain of amino acids is a polypeptide.

As the growing polypeptide is added to the next amino acid in the sequence, the amino acid is enzymatically released from the tRNA, which then returns to the cytoplasm to pick up another amino acid molecule, the same kind it had before. After the message has been completely translated, the polypeptide chain is released. The ribosome breaks up into two parts of different sizes, which reassemble when polysomes are formed, in preparation for further protein synthesis.



Other Aspects of Protein Synthesis

Most mRNAs are short-lived molecules; they are destroyed once their messages have been translated into protein molecules. This may seem wasteful, since each message is for a protein the cells need, but actually it is necessary in order to maintain a balance of reactions in the cell. If a particular message is allowed to be translated continuously, it could cause the finely tuned balance of metabolic reactions to be thrown off. For one thing, the same amino acids would be needed over and over again, depleting the supply of such molecules in the cytoplasm faster than they could be replaced. If a protein is needed in large quantities by the cell, it is obtained by the continual production of more mRNA bearing the same

Anthropology Paper 01 - Volume 01

Ex:
genetic message. In the case of some proteins, such as hemoglobin, mRNAs may be stable, and large numbers are stored in the red blood cells.

Also, it may be detrimental to a cell or an organism to have too much of a very potent substance. Consider, for example, the hormone adrenaline, which is synthesized in the adrenal glands (a pair of small glands situated on top of the kidneys). In times of emergency or excitement, one of the ways the body can respond is by producing adrenaline in response to signals from the nervous system. When circulated throughout the body in the bloodstream, adrenaline causes the symptoms of excitement so familiar to all of us: rapid breathing, dilation of the pupils, spurts of energy and strength, etc. Imaging how exhausting it would be in this state constantly! It is not only fortunate but imperative for our survival that our cells and tissues do not continually produce all the substances they are capable of producing.

✓ tRNAs on the other hand are longer-lived in general and have been found to take part in several cellular functions besides protein synthesis and ribosome particles take part in more than one translation of mRNAs.

How Does a Cell Produce Correct Proteins?

Following the discovery of the steps involved in protein synthesis, a concerted effort was undertaken by many laboratories to determine how the cell is able to synthesize the correct protein. It is obvious that not all cells contain the same proteins. No two cell types look alike, and no two cell types function in the same way; for example, muscle cells are able to contract because of special contractile proteins that are present in great amount in their highly specialized cytoplasm, but not in the cytoplasm of other cells.

✓ The number and sequence of amino acids in its polypeptide chains determine the individuality of a protein. Therefore, in order to determine that a specific protein will be made by a cell, the genetic material DNA must have in its substance the information for a particular number and sequence of amino acids. Because of the great number of proteins found in nature, it was evident to molecular biologists that the answer did not lie in the sugars and phosphoric acid of DNA. These subunits of DNA are the same in all cells and could not therefore account for any of the variability. What is variable in DNA is the sequence and number of nitrogenous bases in cells from organism to organism, although the proportional amounts and sequences of the four bases are the same in cells from the same individual. There must be a correlation, then, between the sequence of bases in DNA and the sequence of amino acids in proteins. In other words, the message for particular proteins must be encoded in some way in the sequence of nitrogenous bases.

The Genetic Code

There are 20 amino acids; there are four different bases in DNA. How many bases would form a code for a particular amino acid? It can be recognized that the code could not be a doublet code. With four bases to work with, there are only 16 possible combinations of two bases, for example, A-T, A-C, A-G, A-A, C-T, C-C, C-G, G-C etc. (Note that here we are discussing the sequence of bases on one strand of DNA, not the base pairs between the two partner strands of a double helix). Whatever the code is, it has to allow for at least 20 different combinations to cover the 20 different amino acids that exist.

✓ It was evident that the code was probably a triplet code, which allows for 64 combinations. It is beyond the scope of our discussion to go into the many experiments conducted. It is enough to say that scientists have established that the genetic is a triplet code, and have completely solved the "meaning" of each of the 64 triplets. This has to stand as one of the great scientific achievements of all time.

	U	C	A	G					
U	UUU UUC UCC UUA UUG	Phe Leu	UCU UCC UCA UCG	Ser	UAU UAC UAA UAG	Tyr Stop Stop	UGU UGC UGA UGG	Cys Stop Trp	U C A G
C	CUU CUC CUA CUG	Leu	CCU CCC CCA CCG	Pro	CAU CAC CAA CAG	His Gln	CGU CGC CGA CGG	Arg	U C A G
A	AUU AUC AUA AUG	Ile	AQU ACC ACA AOG		AAU AAC AAA AAG	Asn Gln	AGU AGC AGA AGG	Ser Arg	U C A G
G	GUU GUC GUA GUG	Val	GCU GCC GCA GCG	Ala	GAU GAC GAA GAG	Asp Glu	GGU GGC GGA GGG	Gly	U C A G

Amino acid names:

Ala = alanine
Arg = arginine
Asn = asparagine
Asp = aspartate
Cys = cysteine

Gln = glutamine
Glu = glutamate
Gly = glycine
His = histidine
Ile = isoleucine

Leu = leucine
Lys = lysine
Met = methionine
Phe = phenylalanine
Pro = proline

Ser = serine
Thr = threonine
Trp = tryptophan
Tyr = Tyrosine
Val = valine

This table shows the complete unabridged "dictionary" of the genetic code. Note that the code contains U and not T in the triplets. This is due to the fact that geneticists refer to the triplets carried on the mRNA molecules as the components of the genetic code rather than the sequence in the DNA itself, because it was from work on mRNA that the code was deciphered. Each triplet representing the information for a particular amino acid is referred to as a codon.

Obviously 64 possible combinations in triplet sequence are more than enough to represent 20 amino acids, and indeed, there has been found a certain redundancy in the genetic code, whereby more than one triplet codes for a particular amino acid. Further, it has been found that the first two bases on the codon are usually the important ones, the third base may in some cases be any of the four bases, and the triplet would still code for the same amino acid as long as the first two bases are the same and have the same sequence. This concept is known as the wobble hypothesis, first formulated by Francis Crick.

Knowledge of the genetic code has helped to clarify some of the events in protein synthesis. The tRNA molecules interact with the codons on the mRNA because at the apex of one of the hairpin loops the molecules have a triplet which is complementary to the codon. This triplet on the tRNA, as was stated before, is called an anticodon. The only type of amino acid that each tRNA carries is the one specified by the codon complementary to the anticodon of the tRNA. The codons are not overlapping on the mRNA.

One can make the analogy of the translation of the sequence of triplets on a messenger molecule to the translation of words from one language to another in this manner the proteins synthesized by a cell are read from messages determined by a gene.

Termination of the Message

Chromosomes contain numerous genes and we now know that each gene must consist of scores of nucleotides. What causes transcription of mRNA to occur only over the length of a particular gene and not overlap into neighboring DNA?

It appears that the message being formed ends at codons, which do not code for any amino acids. If you will refer to the table of Genetic Code again, you will see that there are three such codons which do not code for amino acids. It is thought that the positions of these termination codons (once called nonsense codons) serve to terminate the message. There is some evidence that they also cause the release of the polypeptide chains from the tRNA molecules.

The initiation of gene activity, that is, of the transcription of mRNA can result from "feedback" information, which the nucleus obtains from substances in the cytoplasm. The nature of the chemical state of the nucleoplasm, which must reflect the state of the cytoplasm from which it receives nutrients and replacement substances, could serve as a signal to trigger transcription of certain genes which code for new proteins required by the cell.

GENE MUTATION

In a species, variations may be caused by changes in the environment, by changes in the heredity constitution or more commonly by a combination of both. If a variation appears only when the environment is changed and disappears when it is restored, it is not heritable and as it is not built into the genotype, it does not provide a permanent step on which evolutionary changes can be based. These are phenotypic variations and are known as modifications. They are defined as phenotypic differences between organisms of similar genotype. If however, changes occur which are independent of the environment and heritable, they are liable to provide a permanent step on which evolutionary changes may be built. Such changes occur in the genome of an individual and may be caused by recombination or crossing over and mutation. Recombination usually causes no remarkable variation because it merely redistributes existing genetic material among different individuals. However, mutations are sudden changes in genotype, involving qualitative or quantitative alterations in the genetic material itself.

Mutations occur frequently in the nature and have been reported in many organisms. In man, the mutations cause variation in hair, color, skin pigmentation and several somatic malformations.

KINDS OF MUTATIONS

There exists a lot of controversy about the possible kinds of mutations among geneticists. They have been classified variously according to different criteria as follows:

1. **Classification of Mutation according to type of Cells:** According to their occurrence in somatic and germinal cells, following types of mutations have been classified:

- a) **Somatic Mutations:** The mutations occurring in non-reproductive body cells are known as somatic mutations. The genetic and evolutionary consequences of somatic mutations are insignificant, since only single cells and their daughter cells are involved. If, however a somatic mutation occurs early during embryonic life, the mutant cells may constitute a large proportion of body cells and the animal body may be a mosaic for different types of cells. Somatic mutations have been often related with malignant (cancerous) growth.
- b) **Gametic Mutations:** The mutations occurring in gamete cells (e.g., sperms and ova) are called gametic mutations. Such mutations are heritable and of immense genetic significance. Genetic mutations form the raw material for natural selection.

2. **Classification of Mutations according to the Size and Quality:** According to the size, following two types of mutations have been recognized.

Anthropology Paper 01 - Volume 01

- a) **Point Mutation:** When heritable alterations occur in a very small segment of DNA molecule, i.e., a single nucleotide or nucleotide pair, then these types of mutations are called "point mutations". Point mutations may occur due to following types of sub-nucleotide changes in DNA and RNA:
- 1) **Deletion mutations** - The point mutation, which is caused due to loss or deletion of some portion (single nucleotide pair) in a gene is called deletion mutation.
 - 2) **Insertion or addition mutation** - The point mutations that occur due to addition of one or more extra nucleotides to a gene or cistron are called insertion mutations. Certain chemical substances called mutagens can artificially induce the insertion mutations.
 - 3) **Substitution mutation** - A point mutation in which a nucleotide is replaced by another nucleotide is called substitution mutation. Substitution mutations alter the phenotype of an organism variously and are of great genetic significance.
- b) **Gross Mutation:** When changes involve more than one nucleotide pair, or entire gene, then such mutations are called gross mutations. Gross mutations occur due to rearrangements of genes within the genome.
3. **Classification of Mutation according to the Origin:** According to the mode of origin, following two kinds of mutations have been recognized:
- a) **Spontaneous Mutations:** Spontaneous mutations occur suddenly in the nature and their origin is unknown. They have been reported in many organisms.
 - b) **Induced Mutations:** Mutations can be induced artificially in the living organisms by exposing them to abnormal environments such as radiation, certain physical conditions like temperature and some chemicals. The substances or agents that induce artificial mutations are called mutagens or mutagenic agents. Mutagenic agents are of the following kinds:
 - i) **Radiations** - The radiations which are important in mutagenesis are of two categories: The first type is ionizing radiation such as X-rays and gamma rays, alpha and beta rays, electrons, neutrons, protons and other fast moving particles. The second type is non-ionizing radiations such as ultraviolet and visible light.
 - ii) **Temperature as mutagens** - The rate of all chemical reactions is influenced by temperature. It is not surprising that temperature can be mutagenic. For example, an increase of 10°C temperature increases the mutation rate two or three fold. Temperature probably affects the thermal stability of DNA.
 - iii) **Chemical mutagens** - Many chemical substances have been responsible to increase the mutability of genes. Any chemical substance that effects the chemical environment of chromosomes is likely to influence, at least indirectly, the stability of DNA and its ability to replicate without error. A chemical mutation can cause mutation only when it enters the nucleus of the cell.

CHROMOSOMES

Chromosomes are complex structures located in the cell nucleus, they are composed of DNA, histone and non-histone proteins, RNA, and polysaccharides. They are basically the "packages" that contain the DNA. Normally chromosomes can't be seen with a light microscope but during cell division they become condensed enough to be easily analyzed at 1000X. To collect cells with their chromosomes in this condensed state they are exposed to a mitotic inhibitor which blocks formation of the spindle and arrests cell division at the metaphase stage.

Anthropology Paper 01 - Volume 01

A variety of tissue types can be used to obtain chromosome preparations. Some examples include peripheral blood, bone marrow, amniotic fluid, and products of conception.

Under the microscope chromosomes appear as thin, thread-like structures. They all have a short arm and long arm separated by a primary constriction called the centromere. The short arm is designated as p and the long arm as q. The centromere is the location of spindle attachment and is an integral part of the chromosome. It is essential for the normal movement and segregation of chromosomes during cell division. Human metaphase chromosomes come in three basic shapes and can be categorized according to the length of the short and long arms and also the centromere location. Metacentric chromosomes ⁽¹⁾ have short and long arms of roughly equal length with the centromere in the middle. Submetacentric ⁽²⁾ chromosomes have short and long arms of unequal length with the centromere more towards one end. Acrocentric chromosomes have a centromere very near to one end and have very small short arms. They frequently have secondary constrictions on the short arms that connect very small pieces of DNA, called stalks and satellites, to the centromere. The stalks contain genes that code for ribosomal RNA.

The diagrams called ideograms*, of G-banded chromosomes 1, 9, and 14 are typical examples of metacentric, submetacentric, and acrocentric chromosomes respectively. The ideogram is basically a "chromosome map" showing the relationship between the short and long arms, centromere (cen), and in the case of acrocentric chromosomes the stalks (st) and satellites (sa). The specific banding patterns are also illustrated. Each band is numbered to aid in describing rearrangements.

Normal human somatic cells have 46 chromosomes: 22 pairs, or homologs, of autosomes (chromosomes 1-22) and two sex chromosomes. This is called the diploid number. Females carry two X chromosomes (46,XX) while males have an X and a Y (46,XY). Germ cells (egg and sperm) have 23 chromosomes: one copy of each autosome plus a single sex chromosome. This is referred to as the haploid number. One chromosome from each autosomal pair plus one sex chromosome is inherited from each parent. Mothers can contribute only an X chromosome to their children while fathers can contribute either an X or a Y.

CELL DIVISION

All organisms, even the largest, start their life from a single cell. Growth and reproduction are characteristics of cells, indeed of all living organisms. All cells reproduce by dividing into two, with each parental cell giving rise to two daughter cells each time they divide. These newly formed daughter cells can themselves grow and divide, giving rise to a new cell population that is formed by the growth and division of a single parental cell and its progeny. In other words, such cycles of growth and division allow a single cell to form a structure consisting of millions of cells.

Cell Cycle

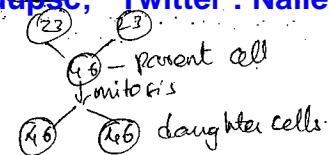
Cell division is a very important process in all living organisms. During the division of a cell, DNA replication and cell growth also take place. All these processes, i.e., cell division, DNA replication, and cell growth, hence, have to take place in a coordinated way to ensure correct division and formation of progeny cells containing intact genomes. The sequence of events by which a cell duplicates its genome, synthesizes the other constituents of the cell and eventually divides into two daughter cells is termed cell cycle. Although cell growth (in terms of cytoplasmic increase) is a continuous process, DNA synthesis occurs only during one specific stage in the cell cycle. The replicated chromosomes (DNA) are then distributed to daughter nuclei by a complex series of events during cell division. These events are themselves under genetic control.

Phases of the Cell Cycle

A typical eukaryotic cell cycle is illustrated by human cells in culture. These cells divide once in approximately every 24 hours. However, this duration of cell cycle can vary from organism to organism and also from cell type to cell type. Yeast for example, can progress through the cell cycle in only about 90 minutes.

- Amitosis - Direct cell division i.e., cytoplasm and nucleus divide simultaneously.
- Occurs in lower forms of life.
- Also in foetal membrane of foetus

Mitosis = Indirect cell division

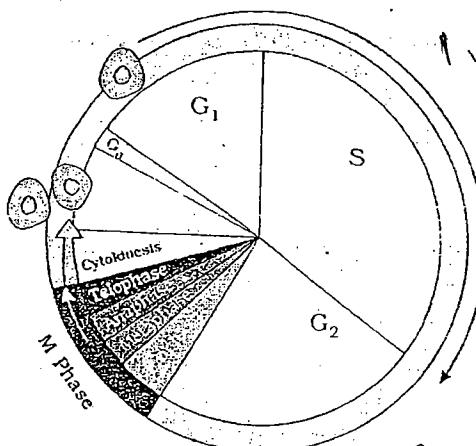


- One cell produces 2 cells with same chromosomal number
- Growth & Nutrition

- Repair of cells occurs through mitosis.
- Growth of organs
- Occurs in all organs

Anthropology Paper 01 - Volume 01

The cell cycle is divided into two basic phases: Interphase and M Phase (Mitosis phase)



The M Phase represents the phase when the actual cell division or mitosis occurs and the interphase represents the phase between two successive M phases. It is significant to note that in the 24 hour average duration of cell cycle of a human cell, cell division proper lasts for only about an hour. The interphase lasts more than 95% of the duration of cell cycle. The M Phase starts with the nuclear division, corresponding to the separation of daughter chromosomes (karyokinesis) and usually ends with division of cytoplasm (cytokinesis). The interphase, though called the resting phase, is the time during which the cell is preparing for division by undergoing both cell growth and DNA replication in an orderly manner. The interphase is divided into three further phases: G₁ phase (Gap 1), S phase (Synthesis) and G₂ phase (Gap 2).

- 3 G₁ phase corresponds to the interval between mitosis and initiation of DNA replication. During G₁ phase the cell is metabolically active and continuously grows but does not replicate its DNA. S or synthesis phase marks the period during which DNA synthesis or replication takes place. During this time the amount of DNA per cell doubles. If the initial amount of DNA is denoted as 2C then it increases to 4C. However, there is no increase in the chromosome number; if the cell had diploid or 2n number of chromosomes at G₁, even after S phase the number of chromosomes remains the same, i.e., 2n. In animal cells, during the S phase, DNA replication begins in the nucleus, and the centriole duplicates in the cytoplasm. During the G₂ phase, proteins are synthesized in preparation for mitosis while cell growth continues.

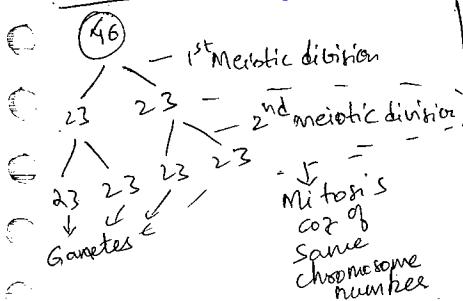
M Phase

This is the most dramatic period of the cell cycle, involving a major reorganization of virtually all components of the cell. Since the number of chromosomes in the parent and progeny cells is the same, it is also called as equational division. Though for convenience mitosis has been divided into four stages of nuclear division, it is very essential to understand that cell division is a progressive process and very clear-cut lines cannot be drawn between various stages. Mitosis is divided into the following four stages: Prophase, Metaphase, Anaphase and Telophase

Prophase

Prophase, which is the first stage of mitosis, follows the S and G₂ phases of interphase. In the S and G₂ phases the new DNA molecules formed are not distinct but intertwined. Prophase is marked by the initiation of condensation of chromosomal material. The chromosomal material becomes untangled during the process of chromatin condensation. The centriole, which had undergone duplication during S phase of interphase, now begins to move towards opposite poles of the cell. The completion of prophase can thus be marked by the following characteristic events:

- Chromosomal material condenses to form compact mitotic chromosomes. Chromosomes are seen to be composed of two chromatids attached together at the centromere.
- Initiation of the assembly of mitotic spindle, the microtubules, the proteinaceous components of the cell cytoplasm help in the process.



- Occurs in specialised tissues of body called gonads
- To avoid multiplication of chromosomal number
- Production of male & female Gametes - Gametogenesis
- Prophase phase is same for Mitosis & Meiosis
- Preparatory phase is also called Tene phase

Anthropology Paper 01 - Volume 01

Cells at the end of prophase, when viewed under the microscope, do not show Golgi complexes, endoplasmic reticulum, nucleolus and the nuclear envelope.

Metaphase

The complete disintegration of the nuclear envelope marks the start of the second phase of mitosis, hence the chromosomes are spread through the cytoplasm of the cell. By this stage, condensation of chromosomes is completed and they can be observed clearly under the microscope. This then, is the stage at which morphology of chromosomes is most easily studied. At this stage, metaphase chromosome is made up of two sister chromatids, which are held together by the centromere. Small disc-shaped structures at the surface of the centromeres are called kinetochores. These structures serve as the sites of attachment of spindle fibres (formed by the spindle fibres) to the chromosomes that are moved into position at the centre of the cell. Hence, the metaphase is characterised by all the chromosomes coming to lie at the equator with one chromatid of each chromosome connected by its kinetochore to spindle fibres from one pole and its sister chromatid connected by its kinetochore to spindle fibres from the opposite pole. The plane of alignment of the chromosomes at metaphase is referred to as the metaphase plate. The key features of metaphase are:

- Spindle fibres attach to kinetochores of chromosomes.
- Chromosomes are moved to spindle

equator and get aligned along metaphase plate through spindle fibres to both poles.

Anaphase

At the onset of anaphase, each chromosome arranged at the metaphase plate is split simultaneously and the two daughter chromatids, now referred to as chromosomes of the future daughter nuclei, begin their migration towards the two opposite poles. As each chromosome moves away from the equatorial plate, the centromere of each chromosome is towards the pole and hence at the leading edge, with the arms of the chromosome trailing behind. Thus, anaphase stage is characterized by the following key events:

- Centromeres split and chromatids separate.
- Chromatids move to opposite poles.

Telophase

At the beginning of the final stage of mitosis, i.e., telophase, the chromosomes that have reached their respective poles decondense and lose their individuality. The individual chromosomes can no longer be seen and chromatin material tends to collect in a mass in the two poles. This is the stage that shows the following key events:

- Chromosomes cluster at opposite spindle poles and their identity is lost as discrete elements.
- Nuclear envelope assembles around the chromosome clusters.
- Nucleolus, golgi complex and ER reform.

Cytokinesis

Mitosis accomplishes not only the segregation of duplicated chromosomes into daughter nuclei (karyokinesis), but the cell itself is divided into two daughter cells by a separate process called cytokinesis at the end of which cell division is complete. In an animal cell, this is achieved by the appearance of a furrow in the plasma membrane. The furrow gradually deepens and ultimately joins in the centre dividing the cell cytoplasm into two.

Significance of Mitosis

Mitosis or the equational division is usually restricted to the diploid cells only. However, in some lower plants and in some social insects haploid cells also divide by mitosis. It is very essential to understand the significance of this division in the life of an organism. Are you aware of some examples where you have studied about haploid and diploid insects? Mitosis results in the production of diploid daughter cells with identical genetic complement usually. The growth of multicellular organisms is due to mitosis. Cell growth results in disturbing the ratio between the nucleus and the cytoplasm. It therefore becomes essential for the cell to divide to restore the nucleo-cytoplasmic ratio. A very significant contribution of mitosis is cell repair. The cells of the upper layer of the epidermis, cells of the lining of the gut, and blood cells are being constantly replaced.

MEIOSIS

The production of offspring by sexual reproduction includes the fusion of two gametes, each with a complete haploid set of chromosomes. Gametes are formed from specialised diploid cells. This specialised kind of cell division that reduces the chromosome number by half results in the production of haploid daughter cells. This kind of division is called meiosis. Meiosis ensures the production of haploid phase in the life cycle of sexually reproducing organisms whereas fertilisation restores the diploid phase. We come across meiosis during gametogenesis in plants and animals. This leads to the formation of haploid gametes. The key features of meiosis are as follows:

- Meiosis involves two sequential cycles of nuclear and cell division called meiosis I and meiosis II but only a single cycle of DNA replication.
- Meiosis I is initiated after the parental chromosomes have replicated to produce identical sister chromatids at the S phase.
- Meiosis involves pairing of homologous chromosomes and recombination between them.
- Four haploid cells are formed at the end of meiosis II.

Meiotic events can be grouped under the following phases:

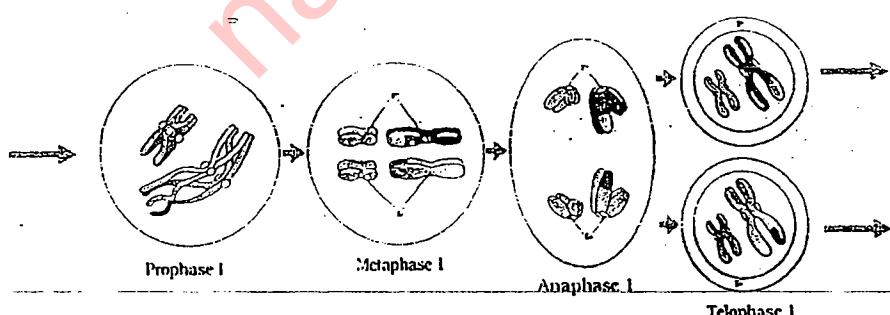
Meiosis I	Meiosis II
Prophase I	Prophase II
Metaphase I	Metaphase II
Anaphase I	Anaphase II
Telophase I	Telophase II

MEIOSIS I

Prophase I: Prophase of the first meiotic division is typically longer and more complex when compared to prophase of mitosis. It has been further subdivided into the following five phases based on chromosomal behaviour, i.e., Leptonene, Zygote, Pachytene, Diplotene and Diakinesis.

During leptotene stage the chromosomes become gradually visible under the light microscope. The compaction of chromosomes continues throughout leptotene. This is followed by the second stage of prophase I called zygotene. During this stage chromosomes start pairing together and this process of association is called synapsis. Such paired chromosomes are called homologous chromosomes. Electron micrographs of this stage indicate that chromosome synapsis is accompanied by the formation of complex structure called synaptonemal complex. The complex formed by a pair of synapsed homologous chromosomes is called a bivalent or a tetrad. However, these are more clearly visible at the next stage. The first two stages of prophase I are relatively short-lived compared to the next stage that is pachytene. During this stage bivalent chromosomes now clearly appear as tetrads. This stage is characterized by the appearance of recombination nodules, the sites at which crossing over occurs between non-sister chromatids of the homologous chromosomes. Crossing over is the exchange of genetic material between two homologous chromosomes. Crossing over is also an enzyme-mediated process and the enzyme involved is called recombinase. Crossing over leads to recombination of genetic material on the two chromosomes. Recombination between homologous chromosomes is completed by the end of pachytene, leaving the chromosomes linked at the sites of crossing over.

The beginning of diplotene is recognized by the dissolution of the synaptonemal complex and the tendency of the recombined homologous chromosomes of the bivalents to separate from each other except at the sites of crossovers. These X-shaped structures, are called chiasmata.



The final stage of meiotic prophase I is diakinesis. This is marked by terminalization of chiasmata. During this phase the chromosomes are fully condensed and the meiotic spindle is assembled to prepare the

homologous chromosomes for separation. By the end of diakinesis, the nucleolus disappears and the nuclear envelope also breaks down. Diakinesis represents transition to metaphase.

Metaphase I: The bivalent chromosomes align on the equatorial plate. The microtubules from the opposite poles of the spindle attach to the pair of homologous chromosomes.

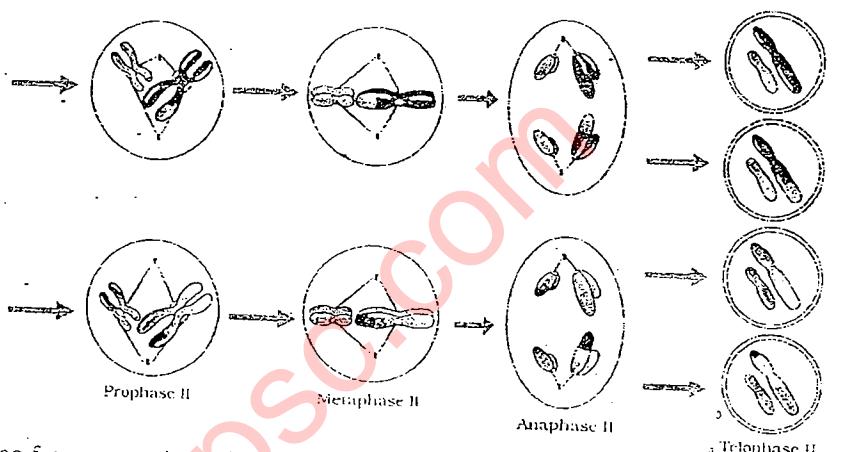
Anaphase I: The homologous chromosomes separate, while sister chromatids remain associated at their

centromeres.

Telophase I: The nuclear membrane and nucleolus reappear, cytokinesis follows and this is called as diad of cells. Although in many cases the chromosomes do undergo some dispersion, they do not reach the extremely extended state of the interphase nucleus. The stage between the two meiotic divisions is called interkinesis and is generally short lived. Interkinesis is followed by prophase II, a much simpler prophase than prophase I.

MEIOSIS II

Prophase II: Meiosis II is initiated immediately after cytokinesis, usually before the chromosomes have fully elongated. In contrast to meiosis I, meiosis II resembles a normal mitosis. The nuclear membrane disappears by the end of prophase II. The chromosomes again become compact.



Metaphase II: At this stage the chromosomes align at the equator and the microtubules from opposite poles of the spindle get attached to the kinetochores of sister chromatids.

Anaphase II: It begins with the simultaneous splitting of the centromere of each chromosome (which was holding the sister chromatids together), allowing them to move toward opposite poles of the cell.

Telophase II: Meiosis ends with telophase II, in which the two groups of chromosomes once again get enclosed by a nuclear envelope; cytokinesis follows resulting in the formation of tetrad of cells i.e., four haploid daughter cells.

Significance of Meiosis

- Meiosis is the mechanism by which conservation of specific chromosome number of each species is achieved across generations in sexually reproducing organisms, even though the process, per se, paradoxically, results in reduction of chromosome number by half. It also increases the genetic variability in the population of organisms from one generation to the next. Variations are very important for the process of evolution.

X-linked Recessive

- Only expressed in females if homozygous
- Female heterozygous are carriers
- Affected males can't transmit to sons
- " have normal parents
(♂ father normal
 mother carrier)

Ex: Haemophilia, Colour blindness,
G6PD deficiency
G.S. Kartic (karticsg@gmail.com)

X-linked Dominant

- Occurs twice as common in females as that of males
- Affected male transmits to all his daughters & none to sons
- Female " " all children
- No question of carriers

Y-linked inheritance (Holandric inheritance)

- All males affected
- All sons of affected males
- Females will never transmit disease.

Methode for study of genetic principles in Man family study

→ Page 38 - Target notes.

Anthropology Paper 01 - Volume 01

9.1 HUMAN GENETICS - METHODS AND APPLICATIONS

Though the branch of human genetics was established as early as 1901, no significant work was done in the early years as man was found to be an unfavourable object for genetic studies because of the following reasons:

1. Controlled breeding experiments under standardized environment are impossible because of social hindrance.
2. Number of offspring of each marriage is very small so that the statistical computations are not possible.
3. Life span of man is long. As a result, the results cannot be studied for three or more generations.
4. Majority of human beings are genetically heterozygous for many characters. Therefore, it is difficult to get isogenic strains.

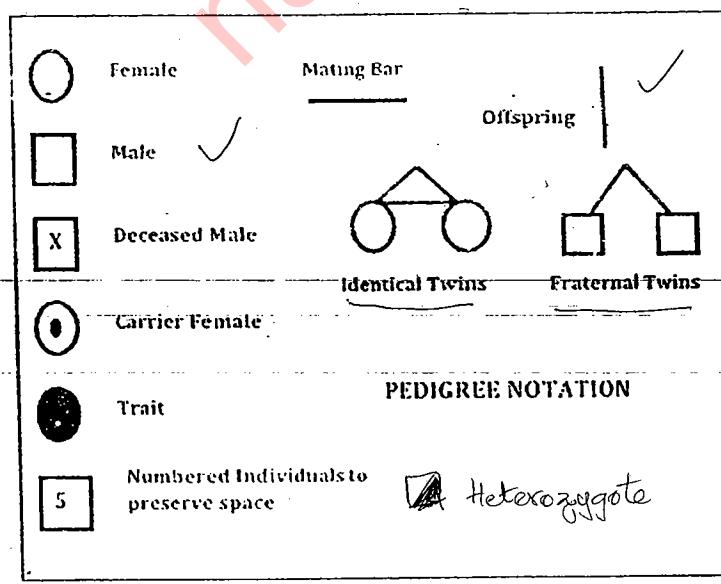
In recent years, the development of newer techniques has helped in understanding the mechanism of inheritance of a number of characters in man.

PEDIGREE ANALYSIS

PA is the study of inheritance. Although human beings have, in the past, reproduced to the point of overpopulating our fragile planet, the relatively small numbers of offspring per generation in our families is a hindrance from the standpoint of genetic analysis. In addition, as geneticists themselves are obviously human beings with limited life spans, it is somewhat impractical to wait for three generations or more to appear.

There is nothing we can - or would - do about making experimental cases, but there is something we can do about establishing patterns of transmission of traits. Since we cannot go forward, that is, wait for future generations, we go backward; we gather information about all existing members of the family under study and as much information as possible about previous generations; and draw up what is referred to as a Pedigree chart, a family tree of sorts, which helps in establishing pattern of transmission of traits.

For the geneticist, however, information about the phenotype, in addition to names of the individuals, is essential if a pedigree is to be useful. The incidence of a particular condition in the pedigree will often indicate whether the gene involved is autosomal or X-linked, dominant or recessive.



Pedigree analysis is the tool most widely used for study and representation of the inheritance of human traits, and certain standard symbols have been established by geneticists in their publications. Traditionally, females are depicted by circles; males are depicted by squares. A mating is indicated by a horizontal bar connecting a circle and square, and the symbols for offspring are shown suspended from a line drawn perpendicular to the mating bar, as in the figure enclosed.

Family members expressing the trait under study are usually indicated by solid black symbols, as is one of the sons in the pedigree in the figure.

Pedigree pattern provides info about Mendelian principles, of segregation & independent assortment; furthermore it may provide info on allelism & linkage.

- Ex-
- Zero family of Siviss - low levels of mortality (L) High incidence of malnutrition.
 - Queen Victoria - Inheritance of Haemophilia - due to high levels of interbreeding.

Uses of PA

- To predict risk of recurrence
- To trace flow of transmission
- To analyse source, mechanism & type of genetic disorder
- Provide data for research on abnormal traits
- Used for Genetic Counselling
- Since critically informative matings can't be designed experimentally, PA is the best means of study of inheritance of such disorders.

Anthropology Paper 01 - Volume 01

Drawbacks

- Can't verify data
 - Confidentiality of info
 - Complexity increases if % of chart increases
- The indication for identical and non-identical twins are given in the figure enclosed. If there are many offspring in a family, numbers are placed in the symbols to conserve space and simplify the pedigree chart. For example, number 5 in the circles and number 4 in the squares (related to each others as brothers and sisters), would indicate that there were five normal girls and boys in this sibship. Occasionally, an arrow pointing at a particular affected individual, as in the figure enclosed, is added to indicate that this is the person who brought the trait to the geneticist's attention. Such a person is called as a Proband, or Propositus if male, and Proposita if female. Sometimes, one can see pedigrees that are headed by a single person. It means that the mate is normal and believed to be of no consequence to the analysis of the pattern of transmission.

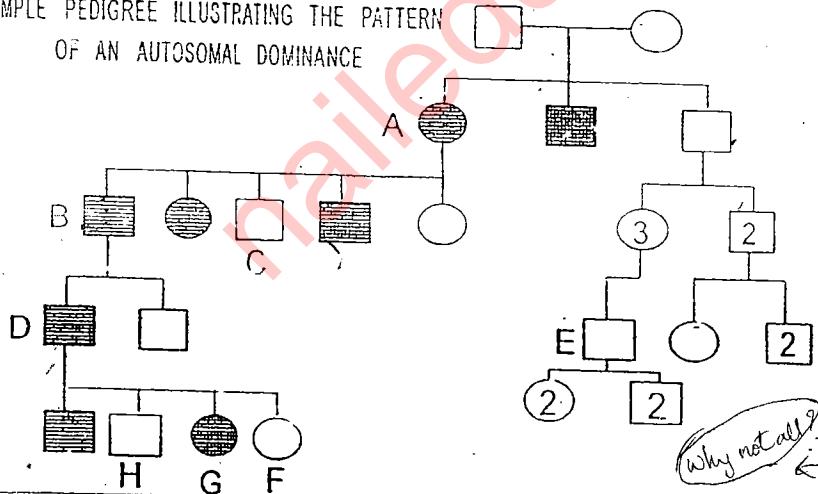
These are the usual symbols used in making up pedigrees. Occasionally, one finds variations in the charts drawn by different geneticists, but they are usually explained by an accompanying key.

Illustrating Inheritance in Pedigree Charts

1. Autosomal Dominance: Ex- Occurrence of Tuberculosis in Czar family

Let us turn our attention now to pedigrees which illustrate different kinds of inheritance. For the most part, we shall be using pedigrees drawn up in the study of inherited diseases rather than normal traits, simply because there are better documented pedigrees of diseases and abnormal conditions. Furthermore, an autosomal dominant gene, regardless of the trait it determines, normal or abnormal, will show the pattern of transmission characteristic of all autosomal dominant genes.

SAMPLE PEDIGREE ILLUSTRATING THE PATTERN OF AN AUTOSOMAL DOMINANCE



In the figure provided, a sample pedigree of a family in which an autosomal dominant trait was transmitted to many in the kindred, certain characteristics of the pattern of transmission would lead a geneticist to conclude that the trait is determined by an autosomal gene (genes present on the chromosomes other than the sex chromosomes - X, Y). First, equal numbers of women and men are affected. Second, the

why not all?

affected man in the third generation (B) passed the trait to his son (D). As we discussed earlier, the Y chromosome is the only sex chromosome which a man transmits to his sons. Thus, the father could not have passed the condition to his sons if determined by an X linked gene, i.e., one that would be located on the man's X chromosome.

Along the same lines, the affected male in the fourth generation (D) produced an affected daughter in the fifth generation (G). This again would be impossible, short of a mutation, if the gene were an X linked dominant, since he would have passed the gene to all his daughters, who would all be affected. An X linked recessive would not be expressed in any daughter, since we must assume from the pedigree that

(Page 106)
X-linked inheritance studies were based on haemophilia, sickle cell, дальность, polydactyly. Studies of idiocy were conducted among Californian western Red Indians.

Q. P.A. can be a basis for Genetic Counselling to enable prospective parents to make an informed choice.

(X-linked recessive characters follow criss-cross pattern of inheritance / skip-generation inheritance)
Anthropology Paper 01 - Volume 01

the man's wife must have been normal, and she would have contributed a dominant normal allele to mask any recessive gene on the man's X chromosome.

This last point holds true for an autosomal gene as well as an X linked one. If the gene were an autosomal recessive, there is no way that the girls in the fifth generation can be affected if the mother is homozygous normal. Therefore, if the gene is neither X linked nor recessive, it must be autosomal dominant.

Additional evidence that the gene is dominant, lies in the fact that there is no skipping of generations in the expression of the trait, because the trait is expressed whenever the gene is present. Another characteristic of dominant traits is that every affected individual has an affected parent. In order for an offspring to have inherited the dominant gene from a parent, that parent must therefore also be affected.

3 A third factor characterizing dominant traits is that when one generation does not express the trait, the trait is lost and will not reappear in future generations. This is so, of course, because the unaffected people must be homozygous recessive and would not have a dominant allele to transmit. The right side of the pedigree for the second, third, fourth and fifth generations illustrates this principle.

4 Equal number of men & women are affected.
Hereditary conditions in humans known to be determined by autosomal dominant genes include achondroplastic dwarfism, Huntington's chorea (a neural degeneration disease), and nail patella syndrome, which is expressed as abnormal knees and nails.

2. Autosomal Recessiveness: (show consanguinity in chart)

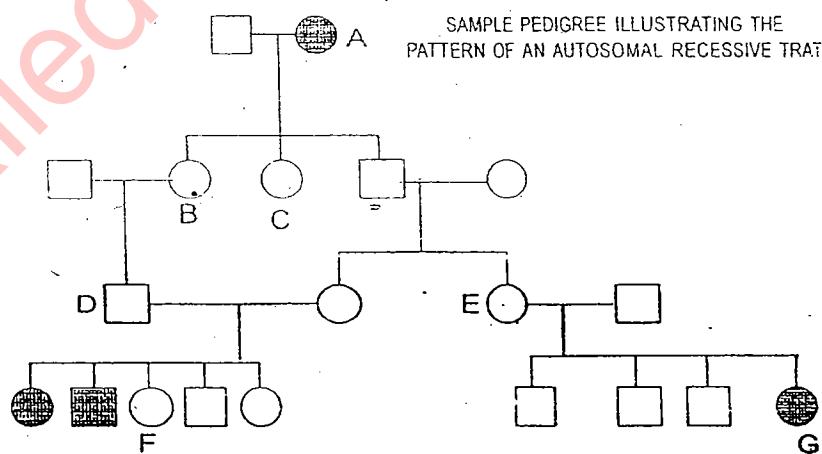
Ex - Colour blindness, hemophilia.

The figure given shows a pedigree of a family in which an inherited condition was found in a number of individuals in the fourth generation. The presence of affected daughters whose fathers and mothers are normal again indicates that the gene is not sex linked but autosomal. It could not be an X linked dominant because the parents are normal, and for the gene to be X linked recessive would require that the paternal X chromosome carry the gene, which would only be possible if the father was affected.

Expressed
only in
Homozygous
state

In addition, the rarity of the condition, and the fact that two different sibships of affected individuals were involved in which the parents are normal, argue strongly against the possibility that this may be an autosomal dominant trait. Because heterozygotes are always phenotypically determined by their dominant genes, the resulting masking of recessive genes leads to "skipping of generations" in

the expression of the condition under study. This is one characteristic of the pattern of transmission that distinguishes recessive genes.



Furthermore, the pedigree shows that the affected son and his affected sister in the fourth generation are the offspring of two related individuals, specifically first cousins. It is not surprising to find consanguineous marriages when dealing with the recessive trait.

If a recessive trait is fairly rare, as are most abnormal conditions, the chances of two people being heterozygous for this are much greater if they are related than if they are not, since the two related people may have inherited the same gene from a common ancestor. The pedigree in the figure is

Ex - Sickle cell Anaemia, Tay Sachs disease, Albinism.

(2)

- ① It has helped physicalologists to understand & reasoning for long standing concept of "Nature & Nurture".

Anthropology Paper 01 - Volume 01

somewhat unusual from this point of view because the father of the other sibship in the fourth generation was apparently unrelated to his wife, but by chance was a carrier for the same recessive gene. Examples of autosomal recessive conditions in humans are diseases such as sickle cell anaemia, Tay Sachs disease (a neural degenerative condition), and albinism. They are, of course, of concern because the genes may be transmitted by carriers who are phenotypically normal. In some cases, such as sickle cell anaemia and Tay Sachs disease, carriers may be identified with biochemical tests.

THE TWIN METHOD (Francis Galton) is used to analyse the role of Heredity & Environment in bringing about human variation.

The act of reproduction culminates by the act of union of egg and sperm, following the intricate maneuvers of meiosis. A number of cellular changes occur in the egg. After the union of the sperm and egg, there is a reconstitution of diploid number of chromosomes in the zygote. From here, the zygote undergoes repeated mitotic divisions to give rise to a fully developed child. Now we shall consider the formation of twins, the determination of zygosity and the estimates of heritability.

✓ It was in 1876 that Francis Galton indicated the value of studying twins in Genetic studies. He also introduced the terms "nature" and "nurture". But two years earlier, in 1874, Camille D'Arreste gave the distinction between two types of twins - Monozygotic and Dizygotic. It was in 1924, Siemens provided the method for investigation of normal variability and determination of zygosity.

How Twins are formed?

(3) Siamese twins (conjoined twins) are also of interest today

There are two types of twins - Monozygotic and Dizygotic.

a) Monozygotic Twins: Monozygotic twins are named so because they originate from a single zygote. The zygote splits into two at an early stage and develops into two genetically identical individuals. It is a case of extreme duplication. Since both the members of the pair are developed from a single zygote, they are genetically identical. Hence monozygotic twins are also called as identical twins, and are of same sex.

b) Dizygotic Twins: Dizygotic twins result from the fertilization of two eggs by two sperms. The genetic relationship between these twins is no different from sibs. Hence dizygotic twins are also called fraternal twins. These twins may be of different sexes also.

✓ The frequencies of twinning are not same in all populations. It is fairly high in Belgium, for example, touching a frequency of 1.79% while in South American population it recorded 0.8%.

Identical twins arising from a division of a single fertilized egg have genetic homogeneity. Any observed differences in their phenotype can be considered purely environmental in origin. By contrast, fraternal twins of the same sex coming from separate eggs may differ genetically and environmentally for any character. By measuring both kinds of twins for a particular character, we can evaluate the roles of Heredity and Environment. That is, on one hand, we have a genetically identical pair of the same age and sex raised in a single uterine environment, and on the other hand, we have a genetically dissimilar pair of the same age and sex also raised in a common uterine environment. Presumably, the difference between these two kinds of twins is only in the extent of their genetic similarity. If phenotypic similarities for a particular character are greater among identical twins than among fraternal twins, or conversely, if phenotypic differences are less among identical, we can ascribe this to the genetic similarity of the identical pairs and the genetic dissimilarity among the fraternal pairs. On the other hand, if phenotypic differences for a particular character are the same for both identical and fraternal twins, we can assume that genetic similarity or dissimilarity plays less of a role than the environmental differences which occur in both kinds of twins.

Concordance and Discordance: One of the ways the phenotypic similarities and differences for a character can be measured in twins is simply to note whether the character is present or absent in one or both members. If both possess the character or are free from it, the pair is concordant, or phenotypically similar. If only one member of the pair possess the trait, the pair is discordant, or phenotypically dissimilar. The extent to which identical or fraternal twins differ in their degree of concordance offers a

- ① Chromosomal Aberrations - If one of MZ has Down syndrome, the other twin also has it.
- ② sporadic disease - Duchene muscular dystrophy affects both MZ twins
- ③ Diabetes Mellitus - In MZ twins, high concordant rate at onset of maturity
low concordant rate at onset of juvenile stage

Anthropology Paper 01 - Volume 01

measure with which to assess the roles of environment and heredity. If, for example, 20 pairs each of both identical and fraternal twins are evaluated for a particular trait, and 12 pairs of identical twins (60%) show concordance as compared to only 4 pairs of fraternal twins (20%), the trait can be considered to have strong heredity element. Similarly, comparisons in this example between the degree of discordance for identical twins (40%) and for fraternal twins (80%) show that the genetic dissimilarity between the members of the latter group has contributed a greater share to the phenotypic dissimilarity. More equal concordance and discordance ratios between the identical and fraternal groups would, in turn, signify less emphasis on heredity similarity in determination of the trait and more emphasis on environmental factors.

(6) DIAGNOSIS OF ZYGOSITY:

Diagnosis of zygosity implies the diagnosis of a twin pair either as Monozygotic or Dizygotic i.e., to know whether the twin pair are born from same zygote or from different zygotes. This diagnosis is extremely significant in the condition where the twins are of same sex and similar looks. There are basically three methods to diagnose the zygosity of twins.

① **Placental Method:** Through this method absolute diagnosis of zygosity is little difficult. However, this method is sometimes used. In the uterus of the mother, the developing zygote is surrounded by two layers - an inner amnion and outer chorion. A third outer most layer constitutes the placenta. In case of the dizygotic twins, each of the members has completely different set of membranes, with exception of the placenta which might be fused. In the case of monozygotic twins, the nature of fetal membranes and extent of placenta vary.

1. A single amnion, chorion and placenta
2. A separate amnion but single chorion and placenta.
3. Separate amnion, chorion, but single placenta.
4. Separate amnion, chorion and also placenta.

These are also referred to as:

- i) Diamniotic, Dichorionic fused.
- ii) Diamniotic, Monochorionic.
- iii) Monoamniotic, Monochorionic.

Based on these conditions of placenta the zygosity of twins can be diagnosed.

② **The Similarity Method:** Geneticists, over a period of time with their experiments, have brought out a list of traits in human beings where individual variations occur, like for example, the tissue antibodies. In order to diagnose the zygosity, if skin graft is made, only a monozygotic twin will be able to accept the skin for its pair. However, morphological features such as eye color, nose form, etc., are less reliable data to assess the zygosity.

③ **DNA Fingerprinting:** The DNA mapping for the monozygotic twins could be exactly similar whereas it may differ for the dizygotic twins. Based on this DNA fingerprint result, the zygosity of twins can be exactly diagnosed.

④ **Dermatoglyphics** - (Arch, loop & whorl) - Total Ridge Count of 10 digits is used as a Dermatoglyphic parameter

HERITABILITY ESTIMATES

Variations between the human beings, which are phenotypic, are a universal phenomenon. However, the causes for variation may differ. There are basically three reasons for phenotypic variations.

- i) Genetic variation.
- ii) Environmental variation.
- iii) Interaction between Genetics and Environment.

For example, the phenotypic stature of a human being depends both on the genotype and environment. Heritability can be defined as that proportion of the phenotypic variation in any population that can be attributed to genetic factors.

Estimation of heritability is not an easy task. There are several factors responsible for it.

- i) Human beings are not experimental animals that can be selectively mated, highly inbred or raised under strictly controlled conditions.
- ii) Phenotypic variation does not just depend upon heredity and environment alone but also the interaction between the two, which is difficult to conserve and also quantify.

✓ Monozygotic twins (MZ) however, provide an excellent opportunity to estimate heritability. This is because the members constituting MZ twins are genetically similar. Since the twins have identical genes, any variation among them is largely due to the environmental effect. Most of the time, the MZ twins are reared in the same environment. However, when they are reared apart, a study of the differences between the two individuals can provide a fairly accurate measure of the genetic and environmental components of certain human characteristics.

As we already noted, if the pair constituting the twins are sharing a characteristic, they are concordant for that character. The percentage of concordance provides an estimate of the degree to which a particular character is genetically influenced i.e., the heritability estimate.

Generally, two types of estimation for the heritability of a particular trait are used by geneticists. One is based on the variance between the MZ and DZ twins and the other is based on the MZ twins reared apart and together. These two methods are discussed here.

(i) Heritability Estimate based on the Variance between MZ and DZ Twins

This method is based on the comparison of twins for the degree of concordance and discordance. For example, the concordance rate for polio is high among the MZ twins and low for DZ twins. This shows that polio has a strong genetic susceptibility.

This concordance or discordance rate indicates within-the-pair variation for MZ or DZ twins. Once this within-the-pair variation is known, then the coefficient of correlation can be calculated by using the formula

$$\text{Coefficient of Correlation} = \frac{(V_{DZ} - V_{MZ})}{V_{DZ}}$$

Where, V_{DZ} = Within-the-pair variation of Dizygotic or Fraternal twins. It is also denoted as V_f .

V_{MZ} = Within-the-pair variation of Monozygotic or Identical twins. It is also denoted as V_i .

It is obvious that for a character with strong genetic tendency, the value of V_{MZ} will be low, compared to the value of V_{DZ} . Hence, the value of the coefficient of correlation for a character with strong genetic tendency would be approaching the value one.

Anthropology Paper 01 - Volume 01

If a particular character has a strong environmental influence, the value of V_{MZ} would be high and it may be as high as the value of V_{DZ} . Hence, here the value of the coefficient of correlation would be approaching the value zero.

By the values of genetic and environmental components of a character, we can calculate the heritability by using the formula

$$H = V_G / (V_G + V_E) = V_G / V_T$$

Here, H = Heritability

V_G = Genetic Variance

V_E = Environmental Variance

V_T = Total Variation

One can observe from the above formula that the genetic component of total variation is being calculated.

(2) Heritability Estimates by Variance between MZ twins Reared Apart and Reared Together

Here, the magnitude of difference between MZ twins reared together and reared apart can be calculated. This is based on the assumption that, since the MZ twins are genetically similar, any variation among them is purely environmental in susceptibility. The coefficient of correlation in this case would be calculated by using the formula:

(i)

$$(V_A - V_T) / V_A$$

Where, V_A is the variation of the MZ twins reared apart and V_T is the variation of the MZ twins reared together.

(ii) In case of a strong environmental influence, the coefficient of correlation would approach 1 (one) because the value of V_A will be large and the value of V_T is small. Similarly, if there is a strong genetic influence, the value of V_A would be small and the value of V_T will be large.

VIABILITY OF TWIN METHOD IN HERITABILITY ESTIMATES

From quite some time, the twin method is utilized to analyze the role of heredity and environment in bringing about human variation. Moreover, a number of human traits, both physical and behavioral, were analyzed using this method. However, the viability of this method is under consideration. This is because of the following reasons:

1. The twin method does not actually specify the genetic and environmental component, but rather realizes it. It does not recognize the nature, location and behavior of genes; neither does it recognize the physical, chemical nor biological components of the environment. Heredity and environment are rather treated as aggregates.
2. Heritability estimation of complex characters as intelligence and behavior are resisted because they result not independently from genetic or environmental influence alone but an abstract interaction between the two, which cannot be easily quantified.
3. Twin method assumes that the MZ twins are exactly identical. However, evidences show that they do differ in a number of characters like size and vigor.
4. The twin method cannot be used to estimate the intra-uterine environmental component and influence. The difference in such environmental component may result in low concordance among MZ twins.

(i) Twin method gives no details about genes concerned / pattern of inheritance / mode of action

Anthropology Paper 01 - Volume 01

5. Twin method cannot be applied to analyze traits like congenital malformations.
6. A majority of environmental factors are still being neglected. Hence the changes brought about by these factors may be falsely assumed to be genetic.
7. The sampling of the environment of twins need not be the environment of the population as a whole.
8. Inter population variations are not accounted for. For example, a particular trait may differ in one population for genetic reasons and the same trait in another population may differ due to environmental influence.
9. One of the most important drawbacks of the twin method is that twinning by nature in itself is a very rare phenomenon. In such a case, the generalizations of the findings based on this study are questionable in its objectivity.

The above stated limitations of the twin method or genetics of twins does not imply any lack of importance of this method. It has very much helped the physical anthropologists to understand and draw reasoning for the long standing "twin" concept of nature and nurture. However, additional methods and their findings should also be made use of, like for example, the foster child method.

CO-TWIN METHOD

We have already noted that twins can be monozygotic or identical (or) dizygotic or fraternal. The degree of similarity can be calculated on the basis of concordance.

In the twin method, the twins are combined and studied in order to understand the influence of heredity and environment. However, in the co-twin studies, the identical twin along with its co-twin and the fraternal twin along with its co-twin are investigated and compared. This technique is used to understand a number of abnormal behaviours, especially schizophrenia.

However, when the conclusions of the twin method and co-twin method are compared for same behaviour, disparities existed. This is due to the following reasons. Take for example, in the co-twin method, rates of schizophrenia are expressed in terms of concordance, the proportion of twin pairs in which both co-twins are diagnosed as schizophrenic. Whereas in the twin method, concordance is determined by "pair wise" analysis, whereby one simply calculates the proportion of all twin pairs in which both are affected. This analysis does not take into consideration the fact that in any given twin pair, either might have been independently registered a case. Thus the co-twins would be counted twice for the concordance rate whereas they should have been counted only once.

The limitations of this method are similar to that of twin method.

FOSTER CHILD (Osborne)

The foster child method is complementary to twin studies on the nurture - nature aspects, particularly of mental traits. It is another method to analyse the respective influence of heredity and environment in the development of a trait.

In this method, various groups of children are selected at random and are placed in different homes classified good, average and poor homes. Since group of children are randomly selected, the genetic factor of the trait studied, say, intelligence, is equally distributed in them. After a lapse of time, they are tested on different intelligence scales. If intelligence has an environmental component, children placed in good homes should score better than those in average and poor homes.

The foster child method is however not free from biases, both at selection and analysis level. Osborne in 1951 has given the following four requirements for using this technique.

- ① Adopted & owned children of a couple can be compared for nature-nurture influence
- ② Children of orphanages who have different biological parents but are being brought up in the same environment are studied.

- ① studies on FC in 1960s in diff. adoptive homes in USA revealed that if children were placed in good environs, there is a possibility of improving their intellectual quality.
 Critique → Only envt doesn't result in higher intelligence.

Anthropology Paper 01 - Volume 01

1. Foster children must be placed in the adoptive home sufficiently early to be relatively uninfluenced by the environment of their original home.
2. There must be little or no selective placement of the children.
3. Adequate sample of adoptive children from various social levels must be included.
4. The foster children must be from one population to eliminate variations due to ethnicity or race.

CYTogenetic METHOD

It is a branch of genetics concerned with study of structure, functions of cell - especially chromosomes. It includes routine analysis of G-banded chromosomes, other cytogenetic banding techniques as well as molecular cytogenetics. Cytogenesis is the study of chromosomes and the related disease states caused by abnormal chromosome number and/or structure. Chromosomes are complex structures located in the cell nucleus, they are such as composed of DNA, histone and non-histone proteins, RNA, and polysaccharides. They are basically the "packages" that contain the DNA. Normally chromosomes can't be seen with a light microscope but during cell division they become condensed enough to be easily analyzed at 1000X. To collect cells with their chromosomes in this condensed state they are exposed to a mitotic inhibitor which blocks formation of the spindle and arrests cell division at the metaphase stage.

A variety of tissue types can be used to obtain chromosome preparations. Some examples include peripheral blood, bone marrow, amniotic fluid, and products of conception. Although specific techniques differ according to the type of tissue used, the basic method for obtaining chromosome preparations is as follows.

- Sample log-in and initial setup.
 - Tissue culture (feeding and maintaining cell cultures).
 - Addition of a mitotic inhibitor to arrest cells at metaphase.
- It deals with study of human chromosomes, ex-chromatid, chromosomal abnormalities & their consequences.
- It examines cell divisions, chromosome number, chromosome morphology, changes of chromosomes.
- Tijo & Levan (1956) are pioneers in this branch of Genetics.

Stain chromosome preparations to detect possible numerical and structural changes.

CHROMOSOMAL AND KARYOTYPE ANALYSIS

Chromosomal constitution of a cell (or) individual with reference to shape, size, morphology etc. is known as karyotype. Human beings have 23 pairs of chromosomes; twenty two pairs are called the autosomes and one pair of sex chromosomes. The autosomes of man and woman have similar appearance but the sex chromosomes are different. In a female the two sex chromosomes are identical and are represented as XX. In male these are dissimilar and are represented as XY. The Y chromosome is smaller than the X and is the male determining chromosome.

The concept of Karyotyping and human Karyotype is already discussed in the chapter on Molecular Evolution of Primates. This method is one of the primary mechanisms through which the human chromosomes can be analyzed.

② Karyotype is a systematized array of chromosomes of a single cell prepared either by drawing or by photography, with the extension in meaning that the chromosomes of a single cell can typify the chromosomes of an individual or even a species.

Karyotype Nomenclature - (46,XY) (46,XX)

③ The term Ideogram means the diagrammatic representation of a karyotype, which may be based on measurements of chromosomes in several or many cells.

For identifying various regions of individual chromosomes, a new technique is being practiced since 1969. This involves staining the chromosomes with fluorescent dyes after certain treatments. The staining gives different patterns of bands and interbands (stained and unstained regions) along the length of chromosomes. The banding patterns of a particular chromosome remain constant for a particular treatment. At present, four such banding patterns are known which are represented as Q, G, C and R

④ Computer Imaging can also be used to produce a visual display of chromosomes.

- ① Clinical diagnosis - Helps in patients with congenital malformations.
- ② Gene mapping - Helps in localisation of genes position on chromosomes.
- ③ Role in cancer - Detection of Philadelphia chromosome.
- ④ Repeated fetal loss - Detection of chromosomal defect.
- ⑤ Prenatal diag nosis

(5) ✓

Anthropology Paper 01 - Volume 01

✓ patterns. According to normal banding patterns, abnormalities in different chromosomes can easily be identified. Comparing

1. Q Banding: The Q bands are fluorescent bands observed on human chromosomes by staining with quinacrine (Q) mustard and observing with UV light. By this staining, Y chromosome becomes brightly fluorescent while the distal ends of each chromatid remain unstained.
2. G Banding: The G bands are produced by staining human chromosomes with Giemsa Stain. These bands occur on the same locations as the Q bands. Their staining does not require fluorescent microscopy.
3. C Banding: The C bands are regions of heterochromatin. ('C' refers to Constitutive Heterochromatin). These are localized to particular sites on the chromosomes. For example, these are localized to centromere regions of a chromosome.
4. R Banding: This is also called Reverse Banding. The R bands are located in those regions of chromosomes that lie between the fluorescent Q bands. These appear as green; brightly fluorescent band with acridine orange staining.

5. T Banding - To identify virtualise telomeres. 6. Silver staining - Uses silver nitrate.

Significance of Chromosomal analysis

- (b) a) Study of human chromosomes has helped a lot in correlating various human diseases, malformation and deformities with the abnormalities in the number and structure of chromosomes. These abnormalities may be in the autosomes or sex chromosomes. The various abnormalities, both numerical and structural aberrations are discussed in the chapter on Chromosomal disorders.
- b)

Chromosomal Abnormalities

↳ constitutional
↳ acquired

Aneuploidy (monosomy, trisomy, tetrasomy)
↳ Polyploidy (triploidy, tetraploidy)
↳ (insects)

Although chromosome abnormalities can be very complex there are two basic types: numerical and structural. Both types can occur simultaneously.

Numerical abnormalities involve the loss and/or gain of a whole chromosome or chromosomes and can include both autosomes and sex chromosomes. Generally chromosome gain has a greater effect on an individual than does chromosome loss although these can also have severe consequences. Cells which have lost a chromosome are monosomy for that chromosome while those with an extra chromosome show trisomy for the chromosome involved. Nearly all autosomal monosomies die shortly after conception and only a few trisomy conditions survive to full term. The most common autosomal numerical abnormality is Down Syndrome or trisomy-21. Trisomies for chromosomes 13 and 18 may also survive to birth but are more severely affected than individuals with Down Syndrome. Curiously, a condition called triploidy in which there is an extra copy of every chromosome (69 total), can occasionally survive to birth but usually die in the newborn period.

Another general rule is that loss or gain of an autosome has more severe consequences than loss or gain of a sex chromosome. The most common sex chromosome abnormality is monosomy of the X chromosome (45,X) or Turner Syndrome. Another fairly common example is Klinefelter Syndrome (47,XXY). Although there is substantial variation within each syndrome, affected individuals often lead fairly normal lives.

Occasionally an individual carries an extra chromosome which can't be identified by its banding pattern, these are called marker chromosomes.

Structural abnormalities involve changes in the structure of one or more chromosomes. They can be incredibly complex but for the purposes of this discussion we will focus on the three of the more common types:

- Deletions involve loss of material from a single chromosome. The effects are typically severe since there is a loss of genetic material.

Anthropology Paper 01 - Volume 01

- Inversions occur when there are two breaks within a single chromosome and the broken segment flips 180° (inverts) and reattaches to form a chromosome that is structurally out-of-sequence. There is usually no risk for problems to an individual if the inversion is of familial origin (has been inherited from a parent.) There is a slightly increased risk if it is a de novo (new) mutation due possibly to an interruption of a key gene sequence. Although an inversion carrier may be completely normal, they are at a slightly increased risk for producing a chromosomally unbalanced embryo. This is because an inverted chromosome has difficulty pairing with its normal homolog during meiosis, which can result in gametes containing unbalanced derivative chromosomes if an unequal cross-over event occurs.
- Translocations involve exchange of material between two or more chromosomes. If a translocation is reciprocal (balanced) the risk for problems to an individual is similar to that with inversions: usually none if familial and slightly increased if de novo. Problems arise with translocations when gametes from a balanced parent are formed which do not contain both translocation products. When such a gamete combines with a normal gamete from the other parent the result is an unbalanced embryo which is partially monosomic for one chromosome and partially trisomic for the other.

Numerical and structural abnormalities can be further divided into two main categories: constitutional, those you are born with; and acquired, those that arise as secondary changes to other diseases such as cancer.

Sometimes individuals are found who have both normal and abnormal cell lines. These people are called mosaics and in the vast majority of these cases the abnormal cell line has a numerical chromosome abnormality. Structural mosaics are extremely rare. The degree to which an individual is clinically affected usually depends on the percentage of abnormal cells. A routine Cytogenetic analysis typically includes the examination of at least 15-20 cells in order to rule out any clinically significant mosaicism.

These are just some of the more common abnormalities encountered by a Cytogenetic Laboratory. Because the number of abnormal possibilities is almost infinite, a Cytogeneticist must be trained to detect and interpret virtually any chromosome abnormality that can occur.

BIOCHEMICAL METHODS (Beadle & Tatum); Garrod is the father of Biochemical Genetics. Garrod introduced the concept of "in-born error of metabolism".

- Genes control the appearance of a phenotypic trait of an organism by exercising control on the developmental and biochemical activities of its cells. All these cellular activities are controlled by enzymes, whose synthesis is directly supervised by genes. A dominant gene is capable of synthesizing the required enzyme and expresses itself, whereas the recessive gene is unable to produce the functional enzyme and hence is unable to express itself. That genes express themselves through the synthesis of enzymes was demonstrated by Beadle and Tatum in 1941. They proposed "one gene one enzyme" hypothesis. This hypothesis means that all the steps which transform a precursor substance to its end product that is ultimately expressed into a structural or functional phenotypic trait, constitutes a biosynthetic or metabolic pathway. Each step of biosynthetic pathway is catalyzed by a specific enzyme which in turn is synthesized under the control of a specific gene.

- Biochemical genetics combines genetics and biochemistry to elucidate the nature of metabolic pathways and their control. These have been widely studied in man where any error in the metabolic pathway is expressed in the form of a disease.

- Biochemical genetics was initiated by English physician A.E. Garrod, when he noticed that some of the hereditary diseases in man are due to the effects of mutant genes on the metabolic systems. Five metabolic disorders have been noticed in man associated with the defective metabolism of Phenylalanine, an essential amino acid of dietary proteins, (Phenylketonuria, Alkaptonuria, Tyrosinosis, Albinism, and Goitrous Cretinism). Each of the steps of normal metabolism of phenylalanine is controlled by a specific

Developments in biochemical genetics led to research in pharmacogenetics in late 1950's.

enzyme. Various diseases are caused by mutated genes that block particular steps in biochemical reactions.

(8) A number of procedures for separation of biochemical substances and their analysis have been developed. Most important of them are mentioned here:

1. Separation and Identification of Proteins: There are basically two methods to separate proteins and their identification.

- **Gel-filtration:** This method separates proteins by their molecular weight. The mixture of protein is passed through a column filled with a polysaccharide called sephadex. Sephadex is present in the form of beads with inbuilt holes, and proteins with high molecular weight cannot enter through them, and thus are separated.
- **Electrophoresis:** This involves the separation of proteins based on charge. Proteins being electrically charged, when put in an electric field, move towards positive or negative poles.

After the proteins are separated, their amino acids can be analysed.

2. Sequencing of DNA: DNA can be sequenced and analysed by Maxam - Gilbert method. The DNA is cleaved by four restriction enzymes that cut DNA at different bases. Thus four sets of DNA are found, each having differing lengths of DNA fragments representing the position of enzymes.

IMMUNOLOGICAL METHOD + (pg - 166)

(1) Immunology refers to study of The ability of our bodies and cells to resist invasion by foreign objects, be they cellular, viral, or chemical, is the subject of interest of the increasingly important field of immunology. Like all life processes, the basis for immune reactions can be traced to gene action. Because of the profound influence of molecular genetics on all cellular studies, an area of genetics known as Immunogenetics has developed, which combines the two disciplines. We now know that immune reactions are the result of complex gene regulation in our white blood cells.

What is an Immune Reaction?

(2) Immunogenetics, an area of genetics, which combines Immunology and molecular genetics; and studies

To the layperson, the term immune reaction generally brings to mind common situations such as allergies and the use of vaccinations to render a person immune to some disease. These are immune reactions, of course, but so far, blood-type incompatibility and transplantation rejection, which we will use as examples, are the two major types of immune reactions, which are studied one BTI, TR.

- a Blood-type incompatibility results from the presence of different factors, proteins, which are produced by certain white blood cells called plasma cells and release a circulate in our bloodstream. This production of proteins in reaction to the presence of foreign matter in one's body is known as the circulating or humoral type of immune reaction. Transplantation rejection, on the other hand, results from the recognition of foreign cells in the body and the stimulation of white blood cells known as lymphocytes and macrophages to literally attack the foreign tissue and destroy it. This manner of rejection of foreign cells is known as the cell-mediated type of immune reaction.

Antigens and Antibodies

(4) Basically, an immune reaction involves the interaction of two factors, an outside agent that is unacceptable to the special cells of the body involved in immune reactions, and the body factor that responds to this invader. The "foreign" factors, called antigens, are usually organic substances or cells of some sort. When antigens enter the body, they elicit a reaction from the specialised cells of the host, which results in either the production of special proteins called antibodies or the proliferation of cells called phagocytes (as mentioned above), which literally attack the antigens.

- ① Innate immune system
- ② Adaptive " "
- ③ Humoral " "
- ④ Cellular " "

Anthropology Paper 01 - Volume 01

When antibodies are involved, a number of different kinds of reactions can occur: If the antigen is in solution, reaction with antibodies can cause the antigen to precipitate out of solution; or if cells are the antigenic agent, antibodies can cause them to break open, or lyse; finally, antibodies can cause the antigens to agglutinate, or stick together in clumps.

Circulating Antibodies, Blood Groups and Reaction to Disease

The definitions of antigen and antibody, then, are circular: an antigen is a factor that elicits the production of antibodies. An antibody is the protein, found in blood plasma, which is produced by cells of the body in reaction to the presence of an antigen, and which specifically reacts to that antigen. Because they circulate in the plasma of blood, antibodies which participate in immune reactions are called circulating antibodies.

The Genetic Basis of ABO Blood Types: The clumping reaction, or agglutination, occurs when different types are mixed because type A individuals have anti-B antibody molecules present in their blood and type B people have anti-A antibodies. Type O individuals are found to have both anti-A and anti-B antibody molecules. On the other hand, type AB individuals have no anti-bodies to the ABO group of antigens at all.

Genetic Determination of Antibody Molecule

What has intrigued biologists is the fact that all plasma, or antibody-producing cells of an individual would of course be genetically identical, yet they are capable of producing only one of millions of different antibodies. By being able to respond specifically to each antigen that enters the body, every individual has the potential to produce a staggering number of different antibody molecules. Consider not only all the different micro organisms that can infect us, but also all the various organic substances and plant materials to which many people react.

⑦ The variations in the antibody are made use of in immunological method. Some antigen is injected into man and antibodies are separated and purified. Such antibodies have been studied and their amino acid compositions determined. It has been found that antibodies elicited by different individuals differ in amino-acid composition of different chains. Such antibodies, if injected into some experimental animal will behave as antigen and in the animal the antibody for human antibody will be formed. This anti-serum from the animal is taken which contains antibodies against human antibody. With this anti-serum blood samples can be tested and one will observe how humans differ in genetic variability.

RECOMBINANT DNA TECHNOLOGY has revolutionised the application of molecular biology to medical and agricultural sciences / plant & animal sciences

① The terms "recombinant DNA technology," "DNA cloning," "molecular cloning," or "gene cloning" all refer to the same process: the transfer of a DNA fragment of interest from one organism to a self-replicating genetic element such as a bacterial plasmid.

Would it be possible to edit the genetic text, modifying it to produce a desired result? In the early 1970s, biochemists at Stanford University showed that genetic traits could indeed be transferred from one organism to another. In this experiment, the DNA of one microorganism recombined with the inserted DNA sequence of another, and thus had been edited to exhibit a very specific modification.

The actual editing, or insertion process, is painstaking, for it involves manipulating incredibly tiny pieces of incredibly tiny organisms. But the process can be explained in terms of editing a written text: scissors and "glue" are used to "cut" and "paste."

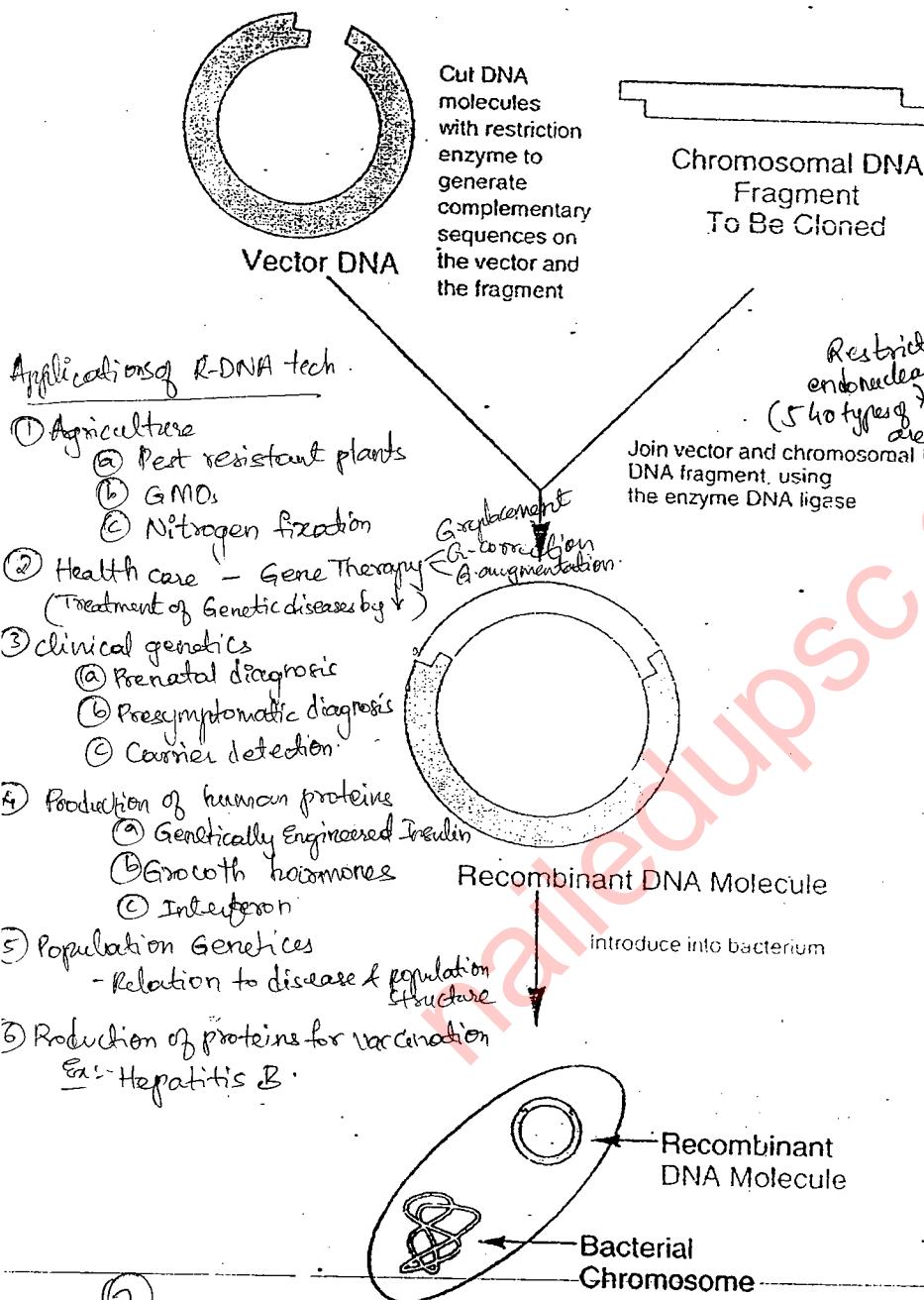
③ The methods used in rDNA technology are fairly simple. We take, for example, the gene for insulin production in humans and paste it into the DNA of *Escherichia coli*, a bacterium that inhabits the human digestive tract. The bacterial cells divide very rapidly making billions of copies of themselves, and each bacterium carries in its DNA a faithful replica of the gene for insulin production. Each new *E. coli* cell has inherited the human insulin gene sentence. → ~~then what?~~

Plasmids occur naturally in many bacteria. They are double stranded and circular.

G.S. Kartic (karticsg@gmail.com)
→ DNA molecules and are relatively small as compared to the host cell chromosomes.
They replicate independently within the bacterial cells.

- ① Isolation of a specific DNA (by restriction endonucleases)
- ② Selection of vectors - 3 types of vectors are commonly used - Plasmids, Bacteriophages, Cosmids
- ③ Preparation of chimeric DNA (or) R-DNA
- ④ Cloning of the chimeric DNA. — (The chimeric DNA contained in the plasmid (vector) can be introduced into bacterial cells by a process called transformation)

Anthropology Paper 01 - Volume 01



How do we transfer the gene embodying the instruction for insulin production? One approach would be to cut the appropriate gene from human DNA and paste, or splice, it into plasmid DNA, a special kind of DNA that takes a circular form and can be used as a vehicle for this editing job. Our "scissors" are the class of enzymes called restriction enzymes. There are well over a hundred restriction enzymes, each cutting in a very precise way a specific base sequence of the DNA molecule. With these scissors used singly or in various combinations, the segment of the human DNA molecule that specifies insulin production can be isolated. This segment is "glued" into place using an enzyme called DNA ligase. The result is an edited, or recombinant, DNA molecule. When this recombinant plasmid DNA is inserted into E. coli, the cell will be able to process the instructions to assemble the amino acids - for insulin production. More importantly, the new instructions are passed along to the next generation of E. coli cells in the process known as gene cloning.

This highly simplified description of rDNA technology does not fully convey the enormous complexity and awesome economy and efficiency of genetic processes. But we can begin to understand how, by using rDNA, it is possible

- Uses (1) to produce substances of medical and economic value.

- (a) Of about 5000 recognised single gene defects in man, about 1500 have been cloned using recombinant DNA techniques. Recombinant DNA technique is used in another completely different way for analysis of structure and function of a gene. Here a DNA is interrupted by insertion of a foreign sequence and study of proteins under such circumstances allows a greater knowledge of functions of genes.

RDNA gives us a rational approach to the understanding of molecular basis of numerous diseases such as sickle cell disease, familial hypercholesterolemia, thalassemia, cystic fibrosis and Huntington's chorea.

- ① Morphosomatic - characters like widow peak, ear to be attachment, tongue rolling ability.
- ② Morphometric - height, I.Q.
- ③ Blood group study - Using Antisera A & B for ABO system ; Antisera - D for Rh-system.
- ④ Red & green colour blindness - using Ishihara charts
- ⑤ PTC tasting - by serial dilution method of Harris & Kalanus

(Morphometric characters are polygenic in nature & hence don't follow Mendelian ratio) Anthropology Paper 01 - Volume 01

9.2 MENDELIAN GENETICS IN MAN

Before we proceed with these topics, it is imperative to know Mendelian inheritance. The following discussion helps us understand the concept of inheritance and heredity.

THE MENDELIAN PRINCIPLES

The Austrian monk Gregor Mendel is considered as the pioneer of modern genetics. He was born on July 22, 1822 in Heinzendorf in Austrian Silesia.

The approach of Mendel was simple, logical, scientific mathematical and analytical, probably, because he was well aware about the failures of his predecessor hybridists. The pre-Mendelian hybridists made observations on plants and animals as a whole and study all variations in the hybrid at a time. Mendel however, concentrated on a particular character at a time and studied the pattern of inheritance of only one or two character or characters.

MENDEL'S CONSIDERATIONS -

For his hybridization experiments Mendel had certain considerations in his mind about the choice of a suitable material, Mendel's considerations about the material were as follows:

1. **Variation:** The organisms that are to be chosen for the genetic experiments should have a number of detectable differences and at a time only single detectable character should be considered.
2. **Reproduction:** The chosen organisms should be sexually reproducing (i.e., by fusion of male and female sex cells) because only then, the offspring will be able to receive different characters from both the male and female parents.
3. **Controlled mating:** The chosen organisms should be able to mate in controlled or well-planned conditions. Because in genetic experiments sometimes we have to rear genetically pure parents by methods of controlled mating. One should maintain careful records of the offspring of many generations.
4. **Short life cycle:** The chosen organisms should have very short life cycles.
5. **Large number of offspring:** The organisms that have been chosen for the genetic experiments should produce large number of offspring after each successive mating, because it will help in deducing the correct conclusions.
6. **Convenience in handling:** The experimental species should be of a type that can be raised and maintained conveniently and inexpensively in the laboratory. For instance, the elephant will prove entirely useless material for genetic experiments than the Drosophila, pea plants, tomato, rats, guinea pigs, etc., which have been generally used and are still used in hybridization experiment.

MENDEL'S MATERIAL

Mendel found edible pea (Pisum sativum), a best material for his hybridization experiments. A pea plant has various contrasting characters among its different varieties such as a stem which may be tall or dwarf, cotyledons may be green or yellow; seeds may be round or wrinkled, seed coat may be colored or colorless; the unripe pods may be green or yellow; the ripe pods may be inflated or constricted between the seeds, flowers may have axial or terminal positions and the colors of flowers may be red or white. Besides these contrasting characters, the pea plant is a very satisfactory material for the hybridization experiments due to its flower structure. The flowers of pea plants are so constructed that the pollens of a flower normally fall on the stigma of the same flower and thus effect self-pollination or self-fertilization. Mendel easily prevented self-fertilization by removing the stamens from the flower buds. Because, for genetic experiments, cross fertilization was the fundamental necessity, so Mendel cross pollinated two desired pea plants differing in a particular pair of contrasting characters by placing the pollens of flower

- Mendel's postulates were not appreciated for a year & were thought to be rules about few properties of peas rather than general theory of inheritance.
- In 1900, 3 biologists - Carl Correns, Hugo DeVries, Tschermak independently worked out Mendel's postulates. Each of them later credited Mendel to be discoverer of the postulates.

Anthropology Paper 01 - Volume 01

on the stigma of other flower whose stamens have already been removed. Further, to prevent artificially pollinated flower from the contamination by pollens of unknown source by insects, Mendel covered the flowers by bags.

MENDEL'S PROCEDURE (Correns)

For getting exact results in breeding experiments, it was necessary for Mendel to rear genetically pure variety of pea plants for a single character. Mendel adopted self fertilization technique for it. For instance, to get pure character for tallness, he fertilized a tall pea plant for many generations till the resulted offspring always produced only tall plants. Likewise, he got genetically pure variety for dwarf pea plants. Mendel cross pollinated these two varieties of pea plants which were differing in a pair of contrasting characters, viz., tallness and dwarfness of the stem. When he made observations on the offspring of first generation, he found only tall plants. He allowed the self pollination of the offspring of first generation and made further observations on the offspring of second generation. He was astonished to note both tall and dwarf offspring in the second generation. This showed him that the character of dwarfness disappeared in first generation but again reappeared in second generation. Further, the tall and dwarf plants of second generation were always in the ratio of 3:1 (3 tall:1 dwarf). He self-pollinated the dwarf offspring of second generation and found only dwarf plants in the third generation. But when he self-pollinated the tall plants of second generation then he found that one-third ($\frac{1}{3}$) tall plants yield only tall plants in third generation, while rest two-third ($\frac{2}{3}$) tall plants yield tall and dwarf plants in the ratio of 3:1.

On the basis of the results of his experiments, Mendel formulated following three laws:

- a) Law of Dominance.
- b) Law of Segregation.
- c) Law of Independent Assortment.

Actually Mendel himself did not postulate any genetic principle or laws; he simply gave conclusive theoretical and statistical explanations for his hybridization experiments in his research paper. However, it was Correns, the discoverer of Mendel's work, who thought that Mendel's discovery could be represented by these fundamental laws of heredity.

I. LAW OF DOMINANCE

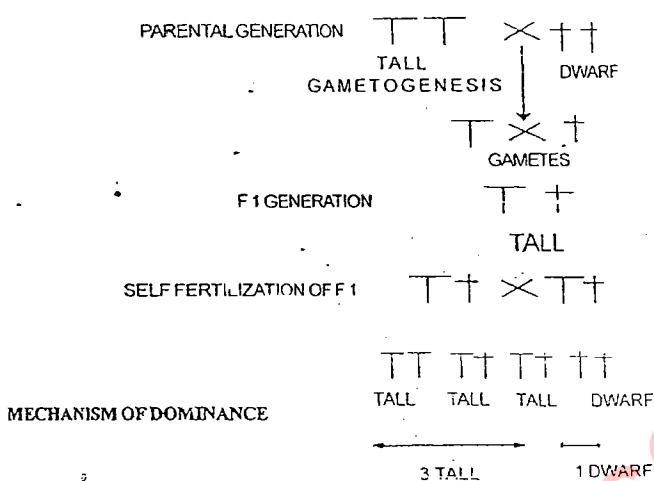
The cross between the pea plants differing in single pair of contrasting characters is known as monohybrid cross. As we have already noticed, when Mendel made a monohybrid cross between tall and dwarf pea plants, then only tall pea plants appeared in the first filial generation (F1). But when the F1 progeny were allowed to be self-fertilized, both tall and dwarf characters appeared in the second filial generation or F2. This shows that in F1 hybrid, the character of tallness dominates or conceals the character of dwarfness. The character of dwarfness, which could not express itself in F1 generation, is called by Mendel as dominant character, while the character which remained unexpressed or latent had been called recessive. According to these results, Mendel formulated the law of dominance which states that "in crossing pure (homozygous) organisms for contrasting character of a pair, only one character of the pair appears in the first filial generation".

MECHANISM OF DOMINANCE

Mendel carefully studied the results of his experiments and it became evident to him that there is a clear-cut difference in the actual visible character and that something which caused its production. Because, the character cannot be present as such in sex cells (sperm and ova) which form the only link between a new individual and the parents. Therefore, there must be something which represent the characters and is responsible for their production. This something of Mendel is now called the factor or gene. The gene thus can be considered as the unit of inheritance that is transmitted in a gamete and determines or

controls the development of a character by interaction with the other genes, the cytoplasm and the environment.

The cytological investigations have now established that the genes are the units of deoxyribonucleic acid (DNA) which along with ribonucleic acid (RNA) and other nucleoproteins constitute the thread-like stainable structures - the chromosomes. The chromosomes are specific in number, shape and size to a particular species.



A diploid cell has two sets of chromosomes that come from two different parents (male and female) via gametes (sperm and ova).

The chromosomes of similar size and nature often form pairs during meiotic cell division and such identical chromosomes are known as homologous chromosomes. Each character of a pair of contrasting characters is represented by a single gene. If the character for tallness is represented by the gene T and because each homologous chromosome of a pair can have single gene for tallness, so the character of tallness in a homozygous tall

pea plant will be represented by a pair of genes "TT". Likewise the homozygous dwarf pea plant contains the gene "tt" for the character of dwarfness.

During the gametogenesis, the homologous chromosomes with TT or tt genes are separated and each chromosome with T or t gene is passed to the gamete. The gamete of both parents unite during the process of fertilization and produce a new individual containing both tall (T) and dwarf (t) characters. This new individual of first generation (F1) contains two different genes of a contrasting pair of characters, therefore, it is known as heterozygote or hybrid. Because the hybrids of F1 have tall stems so the character of tallness (T) is considered as dominant and because the character for dwarfness could not express itself in F1 generation, it is considered recessive.

① INCOMPLETE DOMINANCE

- a/ The law of dominance does not occur universally. For example, when a red flowered pea plant (RR) is crossed with white flowered pea plant (rr), then the F1 hybrid pea plants are found to have pink flowers.
- b/ It shows that gene for red color could not dominate the gene for white color. The appearance of this intermediate character in F1 generation is known as incomplete dominance. This type of incomplete dominance has also been reported in snapdragons and many animals.

② CO-DOMINANCE

- In co-dominance, both the dominant and recessive characters occur side-by-side in F1 hybrids to give the mixed characters. The best example of co-dominance has been observed in cattle. When cattle of red coat are crossed with the cattle of white coat, the F1 heterozygote or hybrid is found to possess roan coat. In roan coat the red and white hairs occur in definite patches but no hair has intermediate color of red and white.

Discovery of exceptions to Mendel's laws (Non-Mendelian Principles)

- ① Incomplete dominance
- ② Co-dominance
- ③ Linked assortment / Genetic linkage
- ④ Multiple alleles

- ⑤ Polygenic Inheritance
- ⑥ Pleiotropic Inheritance
- ⑦ Sex-influenced traits / Sex-controlled characters

- ⑧ Sex-linked gene
- ⑨ Sex-linked gene

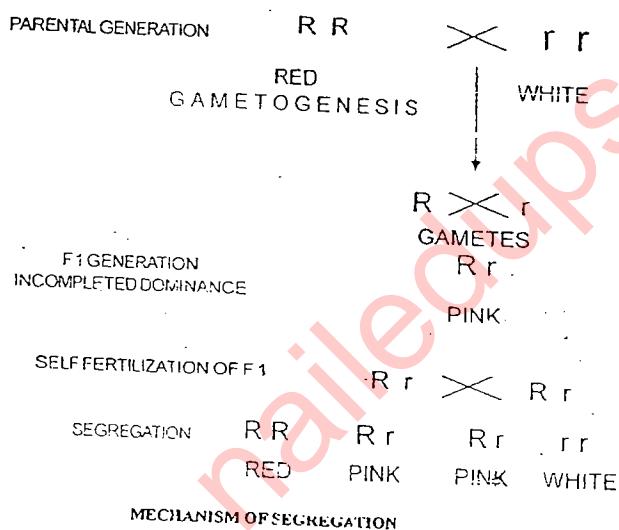
II. LAW OF SEGREGATION

- ✓ The law of segregation is also known as law of purity of gametes. The law states that the hybrids or heterozygotes of F1 generation have two contrasting characters or allelomorphs of dominant and recessive nature. These characters though remain together for long time but do not contaminate or mix with each other and segregate at the time of gametogenesis, so that each gamete receives only one character either dominant or recessive.

For the proper understanding of the Mendel's law of segregation, it will be helpful to study one of the Mendel's monohybrid cross. Mendel crossed a homozygous red flowered pea plant with a homozygous white flowered pea plant. The F1 heterozygotes or hybrids were found to be pink or purple flowered, thus showing the incomplete dominance of red color over white color. When the F1 hybrids were allowed to be self fertilized, they produce both colors (red or purple) and white flowered pea plants in F2 generation in the ratio of three and one (3:1). The reappearance of white color in F2 generation indicates the process of segregation.

MECHANISM OF SEGREGATION

The mechanism of segregation in above mentioned monohybrid cross between red and white flowers pea plants can be understood by assuming that the homozygous red flowered pea plant has the allele RR for Redness and white flowered pea plant has the alleles rr for whiteness. The pea plant with RR alleles produces the gametes with single allele R and pea plant with rr alleles produces the gametes with the allele r. The gametes of both unite to form a hybrid or heterozygote having the alleles Rr, both for redness and whiteness. Due to the phenomenon of incomplete dominance, the allele R for red color partially expresses itself in hybrids of F1, while the allele r for white color remains latent or recessive. Both the allele R and r remain together for long time but they do not affect each other. Neither they mix nor do they contaminate each other.



chromosome of a homologous pair, therefore, each gamete can carry single allele R or r. At the time of gametogenesis two types of gametes are produced by F1 hybrids in equal numbers. Half of the gametes carry the allele R and other half carries the allele r. These gametes during the process of fertilization can unite in three possible combinations, viz., RR, Rr, and rr to produce three types of individuals in F2 generation. Thus in F2, 75% individuals have Red colored flowers and 25% white flowers. The appearance of white color in F2 generation indicates that in the hybrid the allele (r) for white color remains along with allele (R) for red color but does not mix with it or contaminated by it and it separates or segregates during gametogenesis.

III. LAW OF INDEPENDENT ASSORTMENT

To formulate the law of dominance and law of segregation, Mendel considered monohybrid crosses in which single pairs of contrasting characters were considered at a time. But he tried to find out how different characters would behave in relation to each other in their inheritance from generation to generation. For this purpose Mendel crossed two varieties of pea plants which were differing in two pairs

- ① Pedigree Analysis - Dominant/recessive characters - Likelihood of occurrence of a character in a family can be predicted by invoking Mendel's laws.
- ② Medico-Legal Applications - Paternity disputes - E.g. child A's group can't have B parents.
- ③ Medical Applications - Mendelian principles help in case of many different kinds of hereditary diseases and in born errors of metabolism.
- ④ Genetic Counselling
- ⑤ Hybrid varieties - of cereals, fruits, vegetables have been produced at Anthropology Paper 01 - Volume 01 of contrasting characters. Because such crosses yielded dihybrids and at a time two pairs of contrasting characters had been considered in them, therefore, these crosses were known as dihybrid crosses.

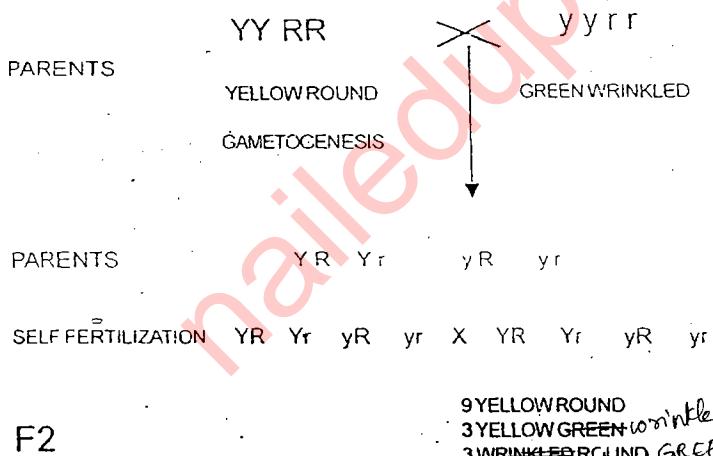
MENDEL'S DIHYBRID CROSS

In one of his hybridization experiment Mendel crossed a homozygous pea plant having yellow round seeds with the homozygous pea plant having green wrinkled seeds. The F₁ hybrids were found to have yellow round seeds. When the F₁ hybrids were allowed to cross among themselves, they produced four types of seeds in the ratio of 9:3:3:1 given as follows:

1. Yellow Round - 9
2. Yellow wrinkled - 3
3. Green Round - 3
4. Green wrinkled - 1

Besides getting the ratio of 3:1 of the monohybrid crosses Mendel got the ratio of 9:3:3:1. This irregularity in the ratio of F₂ offspring was explained by Mendel stating that "when the parents differ from each other in two or more pairs of contrasting characters or factors, then the inheritance of one pair of factor is independent to that of the other pair of factors". This is the Mendel's law of independent assortment.

MECHANISM OF INDEPENDENT ASSORTMENT



MECHANISM OF INDEPENDENT ASSORTMENT

hybrids have been found to contain yellow round seeds showing the dominance of allele Y for yellow color over the recessive allele y for green color and the dominance of allele R for roundness over the recessive allele r for wrinkleness of seed. Now the F₁ hybrids have four types of alleles, viz., Y for yellow color, y for green color, R for round shape and r for wrinkleness of seed. During gametogenesis these four alleles may combine in following four combinations:

1. The allele Y may be associated with the allele R to give rise to YR combination.
2. The allele Y may be associated with the allele r to give Yr combination.
3. The allele y may be associated with the allele R to give yR combination.
4. The allele y may be associated with the allele r to give rise to yr combination.

The mechanism of independent assortment can be understood easily by assuming that the homozygous pea plant with yellow round seeds has the alleles YY and RR for the yellow color and roundness of the seed, respectively. Similarly the homozygous pea plant with green wrinkled seeds contains the alleles yy and rr for the green color and wrinkleness of seeds. The gametes which are produced by YYRR and yyrr plants are YR and yr types respectively. When both parents are crossed, the union of both types of gamete takes place to give the F₁ hybrid (Yr Rr). The F₁

Muller's gene hypothesis, Morgan's gene theory to explain the hereditary mechanism of quantitative inheritance while working on kernel colour in wheat.

Ex:- skin colour in man - Amount of melanin is determined by two pairs of genes & is proportional to the number of dominant genes.

Diffs b/w Mendelian inheritance & Polygenic inheritance:

① In Monohybrid Mendelian Segregation, parents belong to distinct phenotypes

In $F_1 \rightarrow$ entire progeny shows dominant phenotype

$F_2 \rightarrow$ Dominant & recessive segregate in 3:1

Thus, four types of alleles are assorted independently to produce four types of gametes, viz., YR, Yr, yR and yr. These four types of gametes (pollens or ovules) of F_1 hybrid unite at random in the process of fertilization and produce sixteen types of individuals in F_2 generation.

In Mendelian Inheritance - More number of dominant & few recessive individual.

In Polygenic Inheritance - More number of intermediate/avg phenotypes.

Anthropology Paper 01 - Volume 01

Thus the sixteen F_2 individuals have the ratio of 9 yellow rounds: 3 yellow wrinkled: 3 green round: 1 green wrinkled. These results have proved the law of independent assortment and showed that each pair of contrasting characters behaves independently and bear no permanent association or relation with particular character. The allele Y was associated with the allele R in the parent but it does not always remain associated with it in the next generation.

The earlier emphasis for understanding the mechanism of heredity is in the individual. However, anthropological interest lies predominantly with evolution, and the individual is not the unit of evolution. It is not true that people change over time. They get taller and heavier; perhaps their hair changes color, along with all those other things that are variously labeled growth, development, and decline. Yet, even though an individual today is not the same individual he or she will be tomorrow, that person is not evolving. Nor is the fact that people produce offspring different from themselves in evolution, for no two individuals, whether contemporaries or not, are exactly alike. Variation is not evolution. Evolution is change that can lead to the development of new kinds of populations and the population is the unit of evolutionary change.

SINGLE FACTOR, MULTIFACTOR AND POLYGENIC INHERITANCE IN MAN (Not clear)

QUANTITATIVE GENETICS

Eye colour, skin colour, height are not controlled by only single gene.

Genetics is the study of variation. Without variation, genetic analysis at any level becomes difficult. In many cases, this genetic analysis of variation involves striking differences between the organisms (Red or White petals, Long or Short wings) etc. In other cases, however, biological variation is difficult to categorize. E.g., the height and weight in human beings are traits that vary continuously in the population. Distinct classes cannot be identified for such traits, making it difficult to analyze by conventional genetics methods. Quantitative genetics is the discipline that deals with these complex traits that continuously vary in a population.

Quantitative Traits

Quantitative genetics is based on measurements of individuals within a population of organisms. The methods of quantitative genetics recognize two important facts...

1. Most quantitative traits involve contribution of many different genes - sometimes a single gene may exert primary influence but usually there are many equally influential genes. The existence of different alleles at each of these genes will produce genotypic variation which will in turn produce phenotypic variation for the trait.
2. Quantitative traits are often influenced by environmental factors. The environmental influence is to such an extent that quantitative trait will show phenotypic variation over and above that caused by genotypic differences.

The Multifactor Hypothesis

R.A. Fisher realised that the study of quantitative traits had to be reconciled with the Mendelian view of heredity. The problem was that no one could show directly that these traits were determined by single Mendelian factors. Fisher appropriated the seriousness of this problem and proposed a solution.

"Quantitative traits were not determined by single genes, but many genes and their alleles each had small and approximately additive effects".

Thus, a phenotype of an individual depended on its genotype at all the relevant loci, with each allele adding or subtracting a small amount. Traits that have these features are called Polygenic Traits. Fisher also proposed that many environmental factors influenced the trait by adding or subtracting effects in a manner similar to that of all the genetic loci. This

Traits determined by an interaction of genes on several chromosomes (or) at several places on 126 single chromosome.

G.S. Kartic (karticsg@gmail.com)