

# AMERICAN ANTHROPOLOGIST

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VOL. 51

JANUARY-MARCH, 1949

No. 1

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## CULTURAL CAUSALITY AND LAW: A TRIAL FORMULATION OF THE DEVELOPMENT OF EARLY CIVILIZATIONS

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### I. METHODOLOGICAL ASSUMPTIONS

IT IS about three-quarters of a century since the early anthropologists and sociologists attempted to formulate cultural regularities in generalized or scientific terms. The specific evolutionary formulations of such writers as Morgan<sup>1</sup> and Tylor<sup>2</sup> and the functional or sociological formulations of Durkheim and others were largely repudiated by the 20th century anthropologists, especially by those of the so-called "Boas" school, whose field work tested and cast doubt on their validity. Today, despite an enormous and ever-increasing stock-pile of cultural data, little effort has been made to devise new formulations or even to develop a methodology for doing so, except as White and Childe have kept alive the tradition of Morgan, as Radcliffe-Brown and Redfield have continued in the spirit of Durkheim, and as Malinowski has attempted to reconcile diverse schools of anthropology through a "scientific theory of culture."

Reaction to evolutionism and scientific functionalism has very nearly amounted to a denial that regularities exist; that is, to a claim that history never repeats itself. While it is theoretically admitted that cause and effect operate in cultural phenomena, it is considered somewhat rash to mention causality, let alone "law," in specific cases. Attention is centered on cultural differences, particulars, and peculiarities, and culture is often treated as if it developed quixotically, without determinable causes, or else appeared full-blown.

It is unfortunate that the two approaches are so widely thought of as theoretically irreconcilable rather than as expressions of different purposes or interests. The 19th century writers had the perfectly legitimate purpose of making scientific generalizations from what they considered recurrent cultural patterns, sequences, and processes in different cultures, while the more recent school has the equally legitimate purpose of examining the distinctive or non-recurrent features of cultures. As all cultures, though unique in many respects,

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<sup>1</sup> Morgan, 1877.

<sup>2</sup> Tylor, 1865, 1871.

nonetheless share certain traits and patterns with other cultures, an interest in either or both is entirely defensible. In fact, the analyses of cultural particulars provide the data necessary for any generalizations. If the 19th century formulations were wrong, it was not because their purpose was inadmissible or their objective impossible, but because the data were inadequate and insufficient, the methodology weak, and the application of the schemes too broad.

In spite of a half century of skepticism concerning the possibility of formulating cultural regularities, the conviction is widely held that the discovery of cultural laws is an ultimate goal of anthropology, to be attained when fact-collecting and detailed analyses of particular cultures and sequences are sufficiently advanced. White<sup>3</sup> has already offered some general formulations concerning the relationship of energy to cultural development, and he has argued for the importance of formulations of all kinds. Even some members of the so-called "Boas" school expressly advocate a search for regularities. Lowie, for example, remarks that cultural phenomena "do point toward certain regularities, and these it is certainly our duty to ascertain as rigorously as possible."<sup>4</sup> Lesser cites several trial formulations of regularities, which have been made by various persons, including Boas, and calls for more explicit statement of the regularities which, in the course of his work and thinking, every social scientist assumes to exist.<sup>5</sup> The author has attempted to formulate regularities pertaining to the occurrence of patrilineal bands among hunting and gathering tribes<sup>6</sup> and has suggested others that may occur in the origin and development of clans.<sup>7</sup> In reality, hundreds of formulations appear in the literature—for example, correlations of kinship terminologies with forms of social organization—and the possibility of recognizing the general in the particular is implicit in the very terminology of anthropology. The routine use of such concepts, or typological categories, as "clans," "castes," "classes," "priests," "shamans," "men's tribal societies," "cities," and the like, are tacit recognition that these and scores of other features are common to a large number of cultures, despite the peculiarities of their local patterning.

The present need is not to achieve a world scheme of culture development or a set of universally valid laws, though no doubt many such laws can even now be postulated, but to establish a genuine interest in the scientific objective and a clear conceptualization of what is meant by regularities. It does not matter whether the formulations are sequential (diachronic) or functional (synchronic), on a large scale or a small scale. It is more important that comparative cultural studies should interest themselves in recurrent phenomena as well as in unique phenomena, and that anthropology explicitly recognize that a legitimate and ultimate objective is to see through the differences of

<sup>3</sup> White, 1943.

<sup>4</sup> Lowie, 1936, pp. 3, 7.

<sup>5</sup> Lesser, 1930.

<sup>6</sup> Steward, 1936.

<sup>7</sup> *Idem.*, 1937.

cultures to the similarities, to ascertain processes that are duplicated independently in cultural sequences, and to recognize cause and effect in both temporal and functional relationships. Such scientific endeavor need not be ridden by the requirement that cultural laws or regularities be formulated in terms comparable to those of the biological or physical sciences, that they be absolutes and universals, or that they provide ultimate explanations. Any formulations of cultural data are valid provided the procedure is empirical, hypotheses arising from interpretations of fact and being revised as new facts become available.

Three requirements for formulating cultural regularities may be stated in a rough and preliminary way as follows:

(1) *There must be a typology of cultures, patterns, and institutions.* Types represent abstractions, which disregard peculiarities while isolating and comparing similarities. To use Tylor's classic example, the mother-in-law tabu and matrilineal residence, though in each case unique in their local setting, are recurrent types, the cause and effect relationships of which may be compared and formulated. Anthropological terminology demonstrates that hundreds of types of culture elements, patterns, and total configurations are recognized, despite the peculiarities attaching to each in its local occurrence.

(2) *Causal interrelationship of types must be established in sequential or synchronic terms, or both.* Any reconstruction of the history of a particular culture implies, though it may not explicitly state, that certain causes produced certain effects. Insights into causes are deeper when the interrelationships of historical phenomena are analyzed functionally. Functional analysis of archeological data has not been lacking, though archeology has used an atomistic and taxonomic approach<sup>8</sup> far more than has conventional history. Gordon Childe<sup>9</sup> is exceptional in his effort to treat archeological materials functionally. Wittfogel<sup>10</sup> has been outstanding in his use of historical data to make functional-historical analyses of the socio-economic structure of early civilizations.

Where historical data are not available, only the synchronic approach to cause and effect is possible. Radcliffe-Brown, Redfield, and Malinowski, despite important differences in their thinking, are distinctive for their functional analyses.

(3) *The formulation of the independent recurrence of synchronic and/or sequential interrelationships of cultural phenomena is a scientific statement of cause and effect, regularities, or laws.* The particularists, though conceding that such formulations are theoretically possible and even desirable, are inclined to hold that in practice it is virtually impossible to isolate identifiable cause-and-effect relationships that operate in independent cases. Similarities between cultures are interpreted as the result of a single origin and diffusion, provided

<sup>8</sup> See Steward and Setzler, 1938.

<sup>9</sup> Childe, 1934, 1946.

<sup>10</sup> Wittfogel, 1935, 1938, 1939-1940.

the obstacles to diffusion do not seem too great. If the obstacles are very great, differences are emphasized. Thus, most American anthropologists explain similarities between the early civilizations of the New World as a case of single origin and diffusion,<sup>11</sup> but, impressed by the obstacles to trans-oceanic culture contacts, they stress the dissimilarities between the civilizations of the Old and New Worlds. Some writers, however, like Elliot-Smith, Perry, and Gladwin<sup>12</sup> recognize the similarities between the two hemispheres and, unimpressed by barriers to diffusion, use the similarities as proof of a single world origin.

The use of diffusion to avoid coming to grips with problems of cause and effect not only fails to provide a consistent approach to culture history, but it gives an explanation of cultural origins that really explains nothing. Diffusion becomes a mechanical and unintelligible, though universal, cause, and it is employed, as if in contrast to other kinds of causes, to account for about ninety per cent of the world's culture. One may fairly ask whether, each time a society accepts diffused culture, it is not an independent recurrence of cause and effect. Malinowski<sup>13</sup> states: "Diffusion . . . is not an act, but a process closely akin in its working to the evolutionary process. For evolution deals above all with the influence of any type of 'origins'; and origins do not differ fundamentally whether they occur by invention or by diffusion."<sup>13</sup> For example, the civilizations of the Andes and Mexico were based on dense, sedentary populations, which in turn were supported by intensive irrigation farming. In both cases, the early societies were integrated by a theocratic hierarchy, which controlled communal endeavor and enlisted labor for the construction of religious centers. It is not sufficient to say that the agricultural, social, and religious institutions merely diffused as a unit, for that would be merely stating distributions in historical terms but failing to explain process. Incipient farming appeared first, and it diffused before the other complexes developed. The latter have a functional dependence on intensive farming. They could not have been accepted anywhere until it developed, and in the course of its development similar patterns would undoubtedly have emerged, whether or not they were diffused. The increasing population and the growing need for political integration very probably would have created small states in each area, and these states would almost certainly have been strongly theocratic, because the supernatural aspects of farming—for example, fertility concepts, the need to reckon seasons and to forecast the rise and fall of rivers, and the like—would have placed power in the hands of religious leaders. Diffusion may have hastened the development of theocratic states, but in each case the new developments were within determinable limits, and independently involved the same functional or cause-and-effect relationships.

It is true, of course, that many peculiar features common to New World

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<sup>11</sup> Gladwin, 1947.

<sup>12</sup> Malinowski, 1944, pp. 214-215.

<sup>13</sup> See also Wittfogel, 1939-1940, pp. 175-176.

civilizations do not represent a logical outgrowth of basic patterns and that they can be disposed of with the superficial explanation that they diffused. Thus, the wide distribution of such concepts as the plumed serpent or the jaguar god, or of such constructions as terraced pyramids, may be explained in this manner, though deeper analysis might reveal the reasons for their wide acceptance. In general, it is the rather arbitrary, specific, or stylized features, that is, those features which have the least functional dependence on the basic patterns, that provide the greatest evidence of diffusion. These, in other words, are the particulars, which distinguish tribes or areas and which obscure regularities.

Another means of denying the possibility of isolating cultural regularities is to stress that the complexity or multiplicity of the antecedents or functional correlates of any institution makes it virtually impossible to isolate the true causes of the institution; convergent evolution rather than parallel evolution is generally used to explain similarities that seem not to be the result of diffusion. The answer to this is simply that in dealing with cultural phenomena, as in dealing with all the complex phenomena of nature, regularities can be found only by looking for them, and they will be valid only if a rigorous methodology underlies the framing of hypotheses.

It is not necessary that any formulation of cultural regularities provide an ultimate explanation of culture change. In the physical and biological sciences, formulations are merely approximations of observed regularities, and they are valid as working hypotheses despite their failure to deal with ultimate realities. So long as a cultural law formulates recurrences of similar interrelationships of phenomena, it expresses cause and effect in the same way that the law of gravity formulates but does not ultimately explain the attraction between masses of matter. Moreover, like the law of gravity, which has been greatly modified by the theory of relativity, any formulation of cultural data may be useful as a working hypothesis, even though further research requires that it be qualified or reformulated.

Cultural regularities may be formulated on different levels, each in its own terms. At present, the greatest possibilities lie in the purely cultural or superorganic level, for anthropology's traditional primary concern with culture has provided far more data of this kind. Moreover, the greater part of culture history is susceptible to treatment only in superorganic terms. Both sequential or diachronic formulations and synchronic formulations are superorganic, and they may be functional to the extent that the data permit. Redfield's tentative formulation<sup>14</sup> that urban culture contrasts with folk culture in being more individualized, secularized, heterogeneous, and disorganized is synchronic, superorganic, and functional. Morgan's evolutionary schemes<sup>15</sup>

<sup>14</sup> Redfield, 1941.

<sup>15</sup> Morgan, 1877.

and White's formulation concerning the relationship of energy to cultural development<sup>16</sup> are sequential and somewhat functional. Neither type, however, is wholly one or the other. A time-dimension is implied in Redfield's formulation, and synchronic, functional relationships are implied in White's.

Superorganic formulations do not, of course, provide the deeper explanations of culture change that may come from a psychological level or a biological level. Research on these latter levels may profitably run concurrently with the other, but for the present their formulations will be more applicable to synchronic, functional studies than to sequential ones. Thus, to advocate search for regularities in cultural terms is not at all in conflict with those who state that "culture does not exist apart from the individual, its human carrier." To hope for basic and ultimate explanations of behavior that will interrelate cultural, psychological, neurological, physiological, and even physical phenomena is not to deny the desirability of doing what now seems possible and, in view of anthropology's traditional and primary concern with culture, of doing first things first.

The present statement of scientific purpose and methodology rests on a conception of culture that needs clarification. *If the more important institutions of culture can be isolated from their unique setting so as to be typed, classified, and related to recurring antecedents or functional correlates, it follows that it is possible to consider the institutions in question as the basic or constant ones, whereas the features that lend uniqueness are the secondary or variable ones.* For example, the American high civilizations had agriculture, social classes, and a priest-temple-idol cult. As types, these institutions are abstractions of what was actually present in each area, and they do not take into account the particular crops grown, the precise patterning of the social classes, or the conceptualization of deities, details of ritual, and other religious features of each culture center. The latter are secondary and variable so far as the institutions in question are concerned. In a more comprehensive analysis, however, they would serve to distinguish subtypes, which would require more specific formulations.

This conception of culture is in conflict with an extreme organic view, which regards culture as a closed system in which all parts are of equal importance and are equally fixed. It holds that some features of culture are more basic and more fixed than others and that the problem is to ascertain those which are primary and basic and to explain their origin and development. It assumes that, although the secondary features must be consistent and functionally integrated with the primary ones, it is these that are more susceptible to fortuitous influences from inside or outside the culture, that change most

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<sup>16</sup> White, 1943.

readily, and that acquire such a variety of aspects that they give the impression that history never repeats itself.<sup>17</sup>

For the present, it is not necessary to state criteria for ascertaining the primary features. In general, they are the ones which individual scientists are most interested in studying and which the anthropological record shows to have recurred again and again in independent situations. A procedure which attempts to give equal weight to all features of culture amounts to a negation of typing and of making formulations, for it must include all the unique features, which obscure similarities between cultures.

## II. ERAS IN THE DEVELOPMENT OF EARLY CIVILIZATIONS

The present section deals with the development of early agricultural civilizations in Northern Peru (the sequences are longest and best known in this part of Peru, thanks to the Viru Valley project of the Institute of Andean Research), Mesoamerica (Mexico and the Maya area), Mesopotamia, Egypt, and China. These areas were chosen because they were the cradles of civilization and because their exploitation by a pre-metal technology seems to have entailed similar solutions to similar problems and consequently to have caused similar developmental sequences. The environments are arid or semiarid, which, contrary to a common belief, did not impose great difficulties and thereby stimulate cultural development. Instead, they facilitated culture growth because they were easily tilled by digging-stick and irrigation farming. The tropical rain forests, the northern hardwood forests, and the sodded plains areas, on the other hand, were exploited only with the greatest difficulty by people who lacked iron tools.

The procedure to be followed is first to establish a tentative developmental typology or sequence in which the smaller periods are grouped into major eras, which have similar diagnostic features in each area. This requires considerable revision of current terminology, for no two authors use quite the same criteria for major stages of development. Americanists, who have discussed some of these problems together, are now using such terms as Formative, Developmental, Classical, Florescent, and Empire and Conquest, and they are attempting to reach an understanding about the cultural typology implied by these terms. Old World writers still cling largely to such entrenched terms as Mesolithic, Neolithic, Chalcolithic, Ceramolithic, Bronze, and Dynastic, thereby emphasizing technological features of minor developmental significance. Gordon Childe's use of Neolithic Barbarism, Higher Barbarism of the Copper Age, Urban Revolution, and Early Bronze Age, which incorporate some terms from L. H. Morgan, indicates that his thinking is somewhat closer

<sup>17</sup> This proposition has been developed in detail in Steward, 1940: pp. 479-498; 1938: pp. 1-3, 230-262.

CHART I. ARCHEOLOGICAL AND HISTORICAL PERIODS  
GROUPED IN MAJOR ERAS

ERAS	MESOPO- TAMIA, SYRIA, ASSYRIA	EGYPT	CHINA	MESOAMERICA		N. PERU
				MEXICO	MAYA AREA	
Industrial Revolution	Euro-American 19th and 20th century economic and political empires					
Iron Age Culture	Influences from Greece, Rome; later from north and central Europe Spanish Conquest in New World destroys native empires					
Cyclical Conquests	Kassites Hammurabi Dyn. Accad	Hyksos New Empire	Ming Sui, Tang Ch'in, Han			Inca
Dark Ages	Invasions	First Inter- mediate	Warring states			Local states
Initial Conquest	Royal tombs Ur Early Dyn. Sumer	Pyramid Age Early Dynastic Semainian	Chou	Aztec Toltec	Mexican Absorp- tion	Tiahuanaco
Regional Florescence	Jedmet Nasr Warkan- Tepe- Gawra Obeidian	Gerzian  •	Shang “Hsia”	Teoti- huacan	Initial Series or Classical	Mochica Gallinazo
Formative	Halafian Samarran Hassunan Mersian	Amratian Badarian Merimdean Fayumian	Yang Shao Pre-Yang Shao	Archaic or Middle Periods Zacatenco	Formative or Old Em- pire Mamom	Salinar Chavín- Cupisnique
Incipient Agriculture	Tahunian Natufian	Tasian	Plain Pottery?	?	?	Cerro Prieto
Hunting and Gathering	Paleolithic and Mesolithic			Pre-Agriculture		

to that of the Americanists, but his terminology and his period markers still fail to be very comparable to those of the latter.

The second step in the following procedure (Section III) is to suggest cause-and-effect relationships between the cultural phenomena of the succes-



CHART II. ABSOLUTE CHRONOLOGY OF THE MAJOR ERAS

	MESOPOTAMIA	EGYPT	INDIA	CHINA	N. ANDES	MESO-AMERICA
2000					Spanish Conquest	
1000				Cyclical Conquests	Cyclical Conquests	Cyclical Conquests
					Regional Florescence	Regional Florescence
A.D.	Cyclical Conquests	Cyclical Conquests	Cyclical Conquests			
B.C.						
1000				Dark Ages	Formative	Formative
				Initial Conquests		Incipient Agriculture?
2000		Dark Ages	Dark Ages		Incipient Agriculture	
	Dark Ages	Initial Conquests	Initial Conquests	Regional Florescence		Hunting and Gathering
3000	Initial Conquests			Formative	Hunting and Gathering	
	Regional Florescence	Regional Florescence	Regional Florescence	Incipient Agriculture		
4000	Formative	Formative	Formative			
5000						
6000	Incipient Agriculture	Incipient Agriculture	Incipient Agriculture	Hunting and Gathering		
7000						
8000		Hunting and Gathering	Hunting and Gathering			
9000	Hunting and Gathering					

sive eras and to formulate as basic regularities those relationships which are common to all areas. These formulations are offered primarily as an illustration of the generalizing approach to cultural data. Tentative and preliminary, they will be revised again and again as long as research continues and as long as scholars probe for a deeper understanding of the basic processes of cultural development. Even if these formulations were entirely scrapped, they would have served their purpose if they stimulated students of culture development to interest themselves in the same problems, to use comparable methods, and to present their findings in comparable terms—in short, to talk one another's language.<sup>18</sup>

Chart I groups the periods of each center into eras that have the same general features. Periods in the same relative position, consequently, were similar but were not contemporaneous. Chart II places the eras of each center on an absolute time-scale, which is fairly precise for the periods of written history but much less accurate for the early periods. The margin of error in dating these early periods does not, however, greatly affect the functional analysis of cultural development.

### *Pre-agricultural Era*

This era includes all the Old World paleolithic and mesolithic periods, which lacked farming, and the New World pre-agricultural periods. To judge by the simple remains of these periods as well as by the recent hunting-and-gathering cultures, the technologies were devoted principally to satisfying biological needs for food, clothing, and shelter. Pottery, basketry, loom-weaving, metallurgy, permanent houses, and boat and animal transportation were probably absent until they were borrowed to a limited degree from higher centers. Social patterns were based on kinship, age, and sex, but they varied greatly as they became adapted to local conditions. Warfare was restricted to blood feuds, revenge for witchcraft, and perhaps in some areas retaliation against trespass.

### *Incipient agriculture*

This era cannot be dated exactly, and it is known through very few finds. It must have been very long, passing through several stages, which began when the first cultivation of plant domesticates supplemented hunting and gathering, and ended when plant and animal breeding was able to support permanent communities. To judge by what are the earliest-known evidences of domestication in Mesopotamia and Peru, technologies made little advance over those of the previous era until settled village life was fully achieved.

<sup>18</sup> Cultural historical data are from the following sources, unless otherwise cited. Northern Peru: Bennett, 1946; Kroeber, 1940, 1944; Strong, 1947; Willey, 1948. Mesoamerica: Armillas, 1948; Kidder, Jennings, and Shook, 1946; Morley, 1946; Thompson, 1943, 1945; Vaillant, 1944. Mesopotamia and Egypt: Childe, 1934, 1946; Albright, 1946. China: Bishop, 1942; Creel, 1937a, 1937b; Wittfogel, 1935, 1938, 1939-40, 1946.

*Peru:* Cerro Prieto.

Culture: farming based on beans; twined weaving; ceramics absent; semi-subterranean houses.

*Mesoamerica:* As the earliest-known agricultural periods of Mesoamerica appear to have had technologies and temple mounds, which elsewhere characterized the Formative Era, it is generally believed (Morley<sup>19</sup> excepted) that the cultures of these periods were introduced full-blown from elsewhere. Theoretically, however, it would seem that remains of simpler agricultural peoples should antedate the fairly developed theocratic communities in Mesoamerica.

*Mesopotamia:* Natufian, Tahanian.

Culture: probably domesticated millet or wheat and perhaps domesticated animals. Pottery and polished stone lacking.

*Egypt:* Tasian.

Culture: possibly domesticated plants. Pottery present.

*China:* Period of Plain Pottery. This period is considered to be the first phase of neolithic China, though the presence of domesticated plants or animals is doubtful.

### *Formative Era of basic technologies and folk culture*

The Formative Era is so named because the principal technologies—basketry, pottery, weaving, metallurgy, and construction—appeared and the patterns of community culture took form at this time. It was an era of population growth, area expansion of cultures and peoples, comparative peace, and wide diffusion of culture between centers of civilization.

The principal domesticated plants were brought under intensive cultivation, and irrigation was begun on a community scale. In the Old World, the more important domesticated animals, except the horse, were present from early in the Era. In the New World, the absence of suitable wild species for domestication limited such animals to the dog, and, in the Andes, to the llama and alpaca.

Food production was on a subsistence basis, except as a share was provided for the ruling class. Increasingly efficient farming released considerable labor for the satisfaction of socially derived needs; that is, craft production of finer goods and construction of religious edifices for the theocracy made rapid progress during each period.

The sociopolitical unit seems to have been the small local community. The clustering of rooms in house units suggests that lineages or kin-groups were the basis of society. One to several such units were associated with a ceremonial center, which served as the nucleus and integrating factor of a dispersed community. Control of irrigation, which was on a local scale, was one of the more important practical functions of the religious leaders. Warfare was probably limited to raids and contributed little either to social structure or to expansion of the state.

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<sup>19</sup> Morley, 1944.

*Peru:* Chavín-Cupisnique, Salinar.

Technologies: domesticated maize, manioc, beans, gourds, peanuts; small-scale irrigation; llamas. Pottery; metallurgy in gold, copper (?); loom-weaving in cotton; twined baskets; surface adobe houses; balsa (reed bundle) boats.

Social: dispersed communities, evidently centering in religious mounds and temples. Feline, condor, and serpent deities. Theocratic control of society; rulers accorded status burial.

*Mesoamerica:* Armillas<sup>20</sup> and Kidder's<sup>21</sup> Formative; in Mexico, Vaillant's Middle Periods<sup>22</sup>; in Yucatan, Thompson's Formative<sup>23</sup> and Morley's Pre-Maya.<sup>24</sup> These include Zacatenco and Ticomán in highland Mexico, Lower Tres Zapotes on the east coast, Mamom and Chicanel in lowland Guatemala, Miraflores in highland Guatemala, and Playa de los Muertos in Honduras.

Technologies: probably domesticated maize, manioc, and other plants; local irrigation. Pottery; loom-weaving, probably in cotton; basketry (?); no metallurgy. Wattle-and-daub houses in Guatemala.

Social: Small, scattered settlements. Female figurines suggest a fertility cult. Temple mounds; funerary architecture; and beginnings of intellectual development, as evidenced by calendrical stelae of the Maya area, which appeared at the end of the era.

*Mesopotamia:* Childe's<sup>25</sup> Higher Barbarism of the Copper Age and beginnings of his Urban Revolution; beginnings of Albright's<sup>26</sup> Chalcolithic. In Mesopotamia: Sialk I, Mersian, Hassunan, Samarran, and Halafian.

Technologies: domesticated plants, probably wheat, barley, millet, and others; cattle, sheep, goats, pigs; some irrigation. Pottery; loom-weaving, probably in flax; basketry; metallurgy in gold and copper; possibly the wheel; rectangular, adobe houses.

Social: villages have local shrines. Religion involves female and animal figurines; male and female gods are represented.

*Egypt:* Faiyumian, Merimdean, Badarian, Amratian.

Technologies: wheat, barley; cattle, pigs, sheep, goats. Pottery; metallurgy in gold and copper; loom-weaving in linen; coiled basketry. Semi-subterranean, circular houses. Balsa (papyrus bundle) boats.

Social: clans or kin groups (?); captive slaves (?); female and animal figurines in religion; dog-sacrifice in burials.

*China:* Neolithic (Pre-Yang Shao, Yang Shao).

Technologies: millet, sorghum (?), rice, wheat; pigs; probably well-and-ditch irrigation. Pottery; loom-weaving in hemp (?); basketry; metallurgy in copper.

Social: small, semi-permanent settlements of circular pit-houses, possibly based on matrilineal lineages. Religion evidenced by pottery phalli; possibly human sacrifice and cannibalism.

### *Era of Regional Development and Florescence*

This era was marked by the emergence and florescence of regionally distinctive cultures. No new basic technologies were invented, but irrigation

<sup>20</sup> Armillas, 1948.

<sup>21</sup> Kidder, 1946.

<sup>22</sup> Vaillant, 1944.

<sup>23</sup> Thompson, 1943, 1945.

<sup>24</sup> Morley, 1946.

<sup>25</sup> Childe, 1946.

<sup>26</sup> Albright, 1946.

works were enlarged, thus releasing a larger portion of the population to develop arts and crafts and to further intellectual interests. Multi-community states arose.

States were still strongly theocratic, but inter-state competition and state expansion seem to have entailed some militarism. A class-structured society, which was foreshadowed in the previous era, now became fully established. The ruling class appears to have been predominantly theocratic, but it was likely that some status was accorded successful warriors. The priesthood now had sufficient leisure to develop astronomy, mathematics, and writing (these were little developed in Peru). The largest religious edifices were built, and the finest art and manufactures of any era were produced toward the end of this era, each region producing distinctive styles. These products were made by special artisans and were dedicated principally to the upper classes and to the temples. Trade attained important proportions, and improved transportation devices were introduced.

*Peru:* Willey's<sup>27</sup> Regional Classical; Strong's<sup>28</sup> Late Formative and Florescent; Bennett's<sup>29</sup> late Early Periods. Gallinazo and Mochica (Nazca in south Peru).

Technologies: maize, manioc, potatoes, sweet potatoes, calabashes, pumpkins, peanuts; llamas, alpacas. Inter-valley irrigation.

Social: large communities; population maximum; largest mounds, temples; fanged deity, and gods of agriculture, fishing, celestial phenomena, and places. Ruler was warrior-god. Hilltop forts were built. Regional states (entire valley or several valleys?). War captives, human sacrifice, human trophies. Status burial for the upper class.

Roads; probably llama-packing; ocean-going balsa boats with sails (?); trade.

Ideographic writing on beans (?); quipus. Finest art of all eras.

*Mesoamerica:* Armillas<sup>30</sup> Florescent; Kidder's<sup>31</sup> Classical; Thompson's<sup>32</sup> Initial Series; Morley's<sup>33</sup> Old Empire. These include: Middle and Upper Tres Zapotes on the east coast; Teotihuacan and Monte Alban II and III in Mexico; Esperanza in highland Guatemala; and Tsakol and Tepeu in lowland Guatemala.

Technology: local irrigation, chinampas, and terracing in agriculture.

Social: dispersed settlements; local theocratic states that controlled all settlements of a valley or other natural regions. Population maximum (?).<sup>34</sup> Largest mounds and temples. Priestly hierarchy. Gods of rain, water, jaguar, serpent, quetzal. Child sacrifice (?); possibly ancestor worship (as evidenced by figurine portraits in Mexico, status burial in Guatemala). Militarism evidently restricted to raids, with some captive-taking.

Roads and causeways; widespread trade; (toy wheel).

Phonetic writing, mathematics, astronomy. Finest art of all eras.

*Mesopotamia:* Latter part of Albright's<sup>35</sup> Chalcolithic; Childe's<sup>36</sup> Urban Revolution and Early Bronze Age. These include: Obeidian (Al'Ubaid), Warkan-Tepe Gawra, and Jedmet Nasr.

<sup>27</sup> Willey, 1948.

<sup>28</sup> Strong, 1947.

<sup>29</sup> Bennett, 1946.

<sup>30</sup> Armillas, 1948.

<sup>31</sup> Kidder, 1946.

<sup>32</sup> Thompson, 1943, 1945.

<sup>33</sup> Morley, 1947.

<sup>34</sup> Cook, 1947.

<sup>35</sup> Albright, 1946.

<sup>36</sup> Childe, 1946.

Technologies: wheat, barley, millet, date palm, figs, grapes, sesame, onions, garlic, lettuce, melons, chick peas, horse beans; drained fields, large-scale irrigation. Wheel-made ceramics.

Social: urbanization began. Multi-community states, which were essentially theocratic, though rulers had also war power. Large palace-temples. Gods of agriculture. Some pressures or infiltration by foot-nomads.

Horse (?), chariot and four-wheeled wagon; balsa (reed bundle) boats; widespread trade.

Phonetic writing, mathematical systems, astronomy.

*Egypt*: Gerzian.

Technologies: farming as in Formative Era, though probably increased irrigation. Rectangular, above-ground, adobe houses.

Social: Tendency to urbanization; multi-community states, each with an associated animal god and under the rule of heads of principal lineages (?). Some warfare implements expansion of state. Status burial shows a cult of the dead.

Sailing vessels; ass; considerable trade.

Beginnings of writing; calendrical and numerical systems.

Possibly the Semainian period and the beginnings of the Early Dynastic periods should be included in the Era of Regional Florescence in Egypt, for the temple cult appeared, class differentiation became definite, and phonetic writing, a calendrical system, and mathematics were developed. These features, however, continued to develop with little interruption into the era of Conquest and Empire.

*China*: "Hsia" (Black Pottery period) and Shang Dynasty.

Technologies: wheat, millet, rice, pig, cattle, sheep, in north; buffalo and chicken in south. Beginnings of public works in form of dikes; otherwise, local well-and-ditch irrigation were practiced. Bronze manufactures. Horse and chariot. Weaving in silk.

Social: local state, Wittfogel's "feudal" type, under which serfs cultivated the local ruler's land. Divine monarch; status burial in deep grave. Use of oracle bones to forecast rain and for other divination; dragon deity; human and animal sacrifice. Warfare arising from conflict over grazing lands<sup>37</sup> and from pressure of herding nomads.

Picture and ideographic writing. Finest esthetic expressions, especially in bronzes.

### *Cyclical Conquests*

The diagnostic features of this era are the emergence of large-scale militarism, the extension of political and economic domination over large areas or empires, a strong tendency toward urbanization, and the construction of fortifications. In the social structure, priest-warriors constituted the ruling groups, usually under a divine monarch, whose importance is revealed in elaborate status burial. Social classes now tended to become frozen into hereditary classes, in contrast to society of the previous era, which probably permitted individuals some upward mobility through personal achievements. Gods of war became prominent in the pantheon of deities.

There were no important technological changes. Bronze appeared in Peru,

<sup>37</sup> Creel, 1937b, p. 184.

Mesopotamia, and Egypt, and was used for weapons and ornaments, but it contributed little to the production of food or other goods. Iron, though not an iron-age culture, appeared in China. The principal change in manufactures was a strong trend toward standardization and mass production, with a concomitant sacrifice of esthetic freedom and variety. Large-scale trade within the empires, and even beyond, brought the beginnings of a special commercial class, but coinage and an efficient monetary system were not yet developed.

*Peru:* Willey's Expansion and Conquest; Strong's Fusion and Imperial periods; Bennett's Tiahuanaco, Late Periods, and Inca.

Technologies: as before, except that bronze was used for ornaments, weapons, and a few tools. By the Inca period, there was standardized, mass production.

Social: planned urban centers were constructed, and they drew off much population from the local communities. Under the Inca, social classes were finally frozen in a caste system, headed by the divine royal family. A priesthood and bureaucracy ruled the state, and placed levies on the commoners, but the local folk culture persisted. An ancestor cult occurred along with agricultural, place, and animal gods. The state was enlarged by wars of conquest, which perhaps started in the previous era and originated from population pressures. Populations were moved from place to place by imperial command.

*Mesoamerica:* Armillas' Militaristic Period (in Mexico, Toltec, Aztec, Monte Albán V, Tzintzuntzan Tarascan; and, in Yucatan, Mexican Absorption). Thompson's Mexican Period and Morley's New Empire in Yucatan. Kidder's Amatlé and Pamplona in highland Guatemala.

Technologies: as before, except that metallurgy in copper and gold appeared, being used mainly for ornaments. There was extensive trade, and money, in the form of cacao beans, was used during the Aztec period.

Social: The population was increasingly concentrated in defensible sites, and special forts were constructed. Larger and larger areas were drawn into empires, and wealth was concentrated through tribute in the hands of the ruling classes. The king-priest had great military power. There were military classes, warrior societies, and slaves. Great population movements are evident in the inroads of Chichimecs into the Valley of Mexico, the Nahuatl migrations to Central America, and the Mexican invasion of Yucatan. Warfare was intensified, gods of war entered the pantheon, and human sacrifice became a major feature of religion.

*Mesopotamia:* Early Dynastic Sumerians to Dynasty of Accad.

Technologies: bronze was used for weapons, ornaments, and a few tools. There was standardized mass production, especially of goods used by commoners, and widespread trade, mainly for luxury items.

Social: Urban communities attained great size and served as military, political, religious, and commercial centers. The king combined religious and military leadership and controlled multicommunity states. Statuses were strongly differentiated: the king, representing the god (sometimes a war god), was supreme; priests and nobles tended to have hereditary status; farmers, artisans, and wage-earners were either attached to the temple or else worked on privately-owned lands; captives became slaves. Soldiers

sometimes gained status. Gods included agricultural and local deities; the cult of the dead attained some importance, as shown in status burials.

*Egypt*: Early Dynasties, I-IV.

Technologies: Bronze was used for weapons and ornaments, and there was evidence of mass production and extensive trade.

Social: Planned cities were built. The god-king became the military and political head of large states, which were expanded through warfare, and he eclipsed the power of the priesthood. Social structure became rigid, hereditary nobles controlling great wealth. Warfare, probably originating in population pressures and dislocations throughout the Near East, was waged to create empires and to ward off invasions.

Theology was based on a pantheon of general gods, such as the Sun, on local animal gods, and on a cult of the dead. The last, combined somewhat with the first two, became predominant, as evidenced by the divine power of the king and by his status burial in pyramids.

*China*: Chou through Ming Dynasties. The culture center shifts south from the Yellow River to the Yangtze River,<sup>38</sup> while conquests, starting with the Chou Dynasty, culminate in Wittfogel's type of oriental absolute state<sup>39</sup> by the T'ang Dynasty.

Technologies: irrigation and water works develop under state control and become large scale under the Warring States; plow and fertilizer. Iron, glass, and other technologies diffuse from the west.

Social: the Chou Dynasty initiates the era of conquests. A divine ruler and bureaucracy control a state which is stratified into hereditary nobles with military and economic power, merchants, serfs, and some slaves. Cities develop as administrative, religious, and commercial centers.

### III. TRIAL FORMULATION OF DEVELOPMENTAL REGULARITIES OF EARLY CIVILIZATIONS

At the present time the difficulties in making any formulation of the development of early civilizations in the five principal centers of the world are obviously very great. Data on early periods are incomplete, not only because research has been limited but also because it has been directed toward special and restricted problems. Archeology has, until recently, paid comparatively little attention to settlement patterns, demographic trends, and sociological implications of its materials. Historians on the whole are more interested in the fate of particular societies than in culture and its development, and anthropologists have made comparatively little use of the data of written history. These difficulties mean primarily that any present formulation must be highly tentative.

The successive eras in each of the five principal centers of early civilizations appear to have had similar diagnostic features which, arranged chronologically, might be considered as a superficial formulation of regularities. Such a formulation, however, would fail to provide a satisfactory and generally valid functional explanation of cause-and-effect relationships between phenomena.

<sup>38</sup> Chi, 1936.

<sup>39</sup> Wittfogel, 1935.



To provide deeper explanations, it is necessary to make cause-and-effect relationships as explicit as possible and to test the explanations offered for the sequence in each center by the data of other centers. This purpose is consistent with the comparative approach of anthropology, and it is far more important to achieve a common sense of problem than to construct enduring formulations.

The formulation here offered excludes all areas except the arid and semi-arid centers of ancient civilizations. In the irrigation areas, environment, production, and social patterns had similar functional and developmental interrelationships. The productivity of farming was limited only by the amount of water that could be used in irrigation. Metal tools and animal-drawn ploughs, though essential to maximum efficiency of farming in forest or grassland areas, could not increase the yield of irrigation areas beyond the limits imposed by water supply.

Early civilizations occurred also in such tropical rain-forest areas as southern Asia and Yucatan. Yucatan appears to fit the formulation made for the more arid areas to the extent that its sequences were very similar to those of Mesoamerica generally. Farming in Yucatan, however, required slash-and-burn rather than irrigation techniques, and the rural population must have been very scattered. It is possible, therefore, that the Maya were able to develop a high civilization only because they enjoyed an unusually long period of peace; for their settlement pattern would seem to have been too vulnerable to warfare. Yucatan, consequently, should perhaps be excluded from the present formulation. In southeastern Asia, the environment is extremely humid, presenting the difficulties of rain forests and also requiring large drainage projects. And in both areas, the civilizations appear to have been later than and in part derived from those of the irrigation areas.

The Era of Incipient Agriculture in the irrigation centers is very little known, but evidence from Peru, Mesopotamia, and Egypt suggests that it lasted a very long time. Farming was at first supplementary to hunting and gathering, and the social groups were consequently small and probably seminomadic. Technologies differed little from those of the earlier hunting and gathering periods. By the end of this era, farming supported permanent communities, and new technologies began to appear.

A local community, or "folk," culture<sup>40</sup> took form during the next era. The principal crops and animals were brought under domestication, but irrigation was undertaken only on a small, local scale. In subsequent eras, agricultural production increased as irrigation works were developed, the only limit being available land and water, especially the latter. The animal-drawn plough, which appeared in the Old World much later, during the Era of Cyclical Con-

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<sup>40</sup> This may be considered to have had the general characteristics of Redfield's "Folk Society" (1947).

quests, and which was unknown in prehistoric America, no doubt released a certain portion of the population from farm work, but neither it nor iron tools, which appeared still later, could increase production beyond the limits of water supply. Population consequently increased as irrigation works were developed to their maximum. For this reason, the Old World possession of draught animals and the plough does not affect the present formulation.

During the Formative Era, all centers of civilization developed ceramics, loom-weaving, basketry, metallurgy (except Mesoamerica), and the construction of houses and religious edifices. These technologies soon came to be used for two kinds of goods: first, objects that served the simple, domestic—that is, essentially biological—needs of the common folk; second, highly elaborate, stylized goods that served the socially derived needs as well as the more basic needs of the theocratic class. In simple form, some of these technologies spread beyond the areas of irrigation.

Subsequent to the Formative Era, no very important technological advances were made until the Iron Age. Metallurgy ran through similar sequences everywhere (except in Mesoamerica), starting with work in copper and gold and finally achieving bronze. Copper and tin were so rare that the use of bronze was largely limited to ornaments and weapons, while tools of stone, bone, wood, and shell were used for daily chores. Improvement in the other technologies consisted of embellishments and refinements that enhanced their esthetic qualities and produced varied products; but there were no important new inventions.

Transportation improved in successive eras. Domesticated animals were first probably used for packing in all centers except in Mesoamerica, which lacked species suitable for domestication. Wheeled vehicles appeared in the Old World during the Era of Regional Florescence. The wheel was evidently used on toys during the same era in Mesoamerica,<sup>41</sup> but its failure to be used in transportation perhaps may be explained by the absence of draught animals. The importance of transportation increased as states grew larger and as trade expanded. Although draught animals and wheels, which were used on war chariots before they were used on carts and wagons, gave the Old World some technical advantage, every New World center developed roads, boats, and canals to a degree of efficiency which enabled them to achieve states as large as those of the Old World.

The general sequence of social, religious, and military patterns ran a similar course in each center of civilization, and a generally valid formulation is possible. Certain problems which cannot yet be answered will be stated subsequently.

In the Era of Incipient Agriculture it is reasonable to suppose that socio-

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<sup>41</sup> Ekholm, 1946.

political groups were as varied in nature as they are today among the hunting and gathering peoples of arid areas.

At the beginning of the Formative Era, the sociopolitical unit was a small house cluster, which probably consisted of a kin group or lineage. As population increased, new clusters evidently budded off and established themselves in unsettled lands. In the course of time, as flood plains became densely settled and as need arose to divert water through canals to drier land, collaboration on irrigation projects under some coordinating authority became necessary. That the need was met by the rise to power of a theocratic class is shown by the appearance toward the end of the Formative Era of evidence of religious domination of society, for example, ceremonial centers, such as mounds and temples, and a large number of religious objects. Farming required careful reckoning of the seasons, considerable ritual, and worship of agricultural gods, tasks which necessitated a special priesthood. During the Formative Era, a small number of house clusters were dispersed around a ceremonial center and were ruled by a priesthood. The priesthood provided centralized control of irrigation and new patterns of group religion. Society became differentiated into theocratic and common classes.

In the Formative Era, state warfare was probably of minor importance. There is little archeological evidence of militarism, and it is likely that warfare was limited to raids. As long as there was ample land for the expanding population, competition for terrain cannot have been important. Because pastoral nomads during this era were unmounted and probably had not become very numerous, they cannot have been a great threat. In the Near East, they probably had asses, cattle, sheep and goats, but did not ride horses and camels until the Iron age,<sup>42</sup> and horse riding did not appear in China until the Era of Dark Ages or Warring States.

The precise patterning, content, and history of religion, which supplied the socially integrating factor, varied with each center of civilization. In some centers, such as Egypt, China, Peru, and Guatemala, elaborate burials for certain individuals suggest a cult of the dead or ancestor worship, which elevated these persons to the status of god-priests while living and to the status of gods after death. Other kinds of gods are represented by animal, place, and fertility deities. In some instances, the priesthood may have developed from an earlier class of shamans.

The particular religious patterns of each center arose from complex factors of local development and diffusion, and they gave local distinctiveness to the cultures. In terms of the present formulation, however, these differences are secondary in importance to the fact that in all cases a national religion and a priestly class developed because increasing populations, larger irrigation works,

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<sup>42</sup> Albright, 1946, pp. 120-123.

and greater need for social coordination called upon religion to supply the integrating factor. The very great importance of religion at the end of the Formative Era is proved by the effort devoted to the construction of temple mounds, temples, palaces, and tombs, and to the special production of religious ornaments, sculpture, and various material appurtenances of the priesthood and temples. It was the priesthood which, devoting full time to religious matters, now laid the foundations of astronomy, writing, and mathematics in all centers.

The Era of Regional Florescence fulfilled the potentialities of the Formative Era. Communities were welded into small states, which, however, continued to be essentially theocratic, for archeological remains of this era are predominantly of a religious nature. The largest mounds, temples, and tombs (mortuary pyramids and burial mounds) of any eras were constructed. Intellectual trends were fulfilled in the development of phonetic writing, numerical systems, and accurate calendars. Even Peru, which never achieved developed writing, may have used an ideographic system at this time.<sup>43</sup> Ceramics, metallurgy, weaving, work in precious stones, and sculpture attained their highest peak of esthetic expression and their most distinctive local stylization.

The relation of militarism to the enlargement of irrigation works and the expansion of states during the Era of Regional Florescence is not clear. Population, irrigation works, and states all increased in size until the end of the era. In Mesoamerica, it is generally believed<sup>44</sup> that the states were peaceful and theocratic, and Cook<sup>45</sup> believes that population reached its maximum at this time, decreasing in the subsequent era. In this case, a priesthood without the backing of armed force was able to create multi-community states, though the extent of irrigation works at this time is not well known. In other areas, it appears that some militarism was present in the Era of Regional Florescence, and that without warfare the rulers could not have increased the size of states and thereby of irrigation works. In northern Peru, warfare was definitely present in the Era of Regional Florescence, and in China, warfare, arising from conflicts over grazing lands<sup>46</sup> enabled local rulers to extend their authority over subject states,<sup>47</sup> perhaps facilitating the enlargement of irrigation works. Irrigation, however, did not attain maximum size in China until true empires appeared in the following era of Cyclical Conquests.<sup>48</sup> Thus, in China the population maximum came only when militarism achieved empire-wide irrigation projects. In Mesopotamia and Egypt, warfare also appeared during the Era of Regional Florescence, and it was no doubt instrumental in enlarging states, but true kingdoms or empires did not appear until the following era. The re-

<sup>43</sup> Larco Hoyle, 1946, p. 175.

<sup>44</sup> Armillas, 1948; Kidder *et al.*, 1946; Thompson, 1943, 1945; Morley, 1946.

<sup>45</sup> Cook, 1947.

<sup>46</sup> Creel, 1937, p. 184.

<sup>47</sup> Bishop, 1942, p. 20.

<sup>48</sup> Chi, 1936; Wittfogel, 1938, 1939-1940.

lation of irrigation and population to warfare and state size in Egypt are not clear, but if Childe<sup>49</sup> is correct in believing that warfare resulted from competition for lands as well as from the pressures of nomads, it would seem that population limits may have been reached.

This seeming contradiction cannot be resolved at present, but it may be suspected either that Mesoamerica had unusually powerful priests or else that the population maximum was not really reached until after the Era of Regional Florescence, when militarism increased the size of states and consequently of irrigation works. In all centers, a temporary decrease of population probably followed the initiation of large-scale warfare.

Social structure seems to have been very similar in all centers of civilization. The local community retained its folk culture, that is, its social structure, local shrines, agricultural practices, and the like, and its members constituted the commoners. Rulers were predominantly priests, though they began to acquire some military functions. It is possible that war achievements gave status to special individuals and that war captives formed a slave class, but as the existence of true economic slavery in native America is in doubt, the social role of captives and the problem of the origin and nature of slavery are open problems which are excluded from consideration here.

The Era of Cyclical Conquests was one of comparatively few culture changes, except those produced by warfare. It initiated a succession of empires and then local states or dark ages that alternated in a fairly stereotyped pattern until the Iron Age and Industrial Era brought cultural influences from other areas. In each center, large scale warfare, which probably originated from internal population pressures, from competition for resources, and from the pressures of outside nomads, was an instrument in creating true empires and starting dynasties. As the empires grew, irrigation works were increased to the limits of water supply and population also increased. After reaching a peak, marked by a temporary florescence of culture, population pressure and abuse of the common people brought rebellion, which destroyed the empires and returned society to local states and a period of dark ages. Irrigation works were neglected and population decreased. New conquests initiated another cycle.

The cyclical phenomena are strikingly illustrated in China<sup>50</sup> where, during 1500 years of the Era of Cyclical Conquests, each of the four major peaks of empires and dynasties coincided with a population peak.<sup>51</sup> These were separated by periods of internal strife and local autonomy. The series of empires in the Near East, which began in Mesopotamia with the early Dynasty of Sumer and in Egypt with the Dynastic period, ran through cycles generally comparable with those of China and lasted until the northern Mediterranean

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<sup>49</sup> Childe, 1946.

<sup>50</sup> Wittfogel, 1938, 1946.

<sup>51</sup> Ta Chen, 1946, pp. 4-6.

states of the Iron Age brought portions of the Near East under periodic conquests. In Peru, the widespread Tiahuanaco culture and the later Inca Empire probably represent two cycles of empire growth, while in Mexico, the first cycle, that of the Aztec conquests, had not run its course when the Spaniards conquered America.

In the Era of Conquest, militarism produced several important social changes. Towns, which previously had been ceremonial, administrative, and trading centers, now became large walled cities, and special forts were built to afford refuge to the dispersed farm settlements. A true military class appeared in the social hierarchy, and warrior-priests ruled the states and empires. War gods became prominent in the pantheons of state deities.

In this era, all aspects of culture were increasingly regimented at the expense of creative effort. There were sharpened differences in social classes, such as nobles, priests, warriors, commoners, slaves, and stronger differentiation of occupational groups. Laws were codified, learning was systematized (astronomy, theology, mathematics, medicine, writing), art became standardized, and goods were mass-produced by specialists.

Specialized production of commodities and wide-spread trade laid a basis for commercialism, but a free commercial class, factory production, and wage labor could not emerge until economy achieved a strong monetary basis, private property, and specialized cash crops, and until trade was disengaged from the system of state tribute and freed from state control. Though foreshadowed everywhere, this did not occur in the Near East until the Iron Age. In China, the development of private property in land and a system of money and taxation was not sufficient to free economy from the control of powerful states, which existed by virtue of grain taxes which their water works made possible.<sup>52</sup> In the New World, this era was not reached until the Spanish Conquest.

The developments of the Iron Age and the Industrial Era are beyond the scope of the present inquiry. Iron appeared in China in the Era of Cyclical Conquests, but it did not revolutionize the patterns of basic production and social structure as it did in the forested areas of the northern Mediterranean.

#### IV. SUMMARY AND CONCLUSIONS

The above analysis may be briefly summarized.

In arid and semi-arid regions, agriculture may be carried on by means of flood-plain and irrigation farming, which does not require metal tools. As irrigation works are developed, population will increase until the limits of water are reached. Political controls become necessary to manage irrigation and other communal projects. As early societies were strongly religious, individuals with supernatural powers—lineage heads, shamans, or special priests—formed a

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<sup>52</sup> Wittfogel, 1935, 1939-1940.

theocratic ruling class, which governed first multi-house-cluster communities and later multi-community states.

The increasing productivity of farming released considerable labor from subsistence activities, and new technologies were developed—basketry, loom-weaving, pottery, metallurgy, domestic and religious construction, and transportation facilities. Products made for home use were simple and utilitarian; those made for the theocratic class and for religious purposes became increasingly rich and varied, and they required an increasing proportion of total productive efforts.

When the limits of agricultural productivity under a given system of irrigation were reached, population pressures developed and interstate competition for land and for produce of all kinds began. The resulting warfare led to the creation of empires, warrior classes, and military leaders. It also led to enlargement of irrigation works and to a further increase of population. But the powerful military empires regimented all aspects of culture, and few new inventions were made. Consequently, each culture entered an era of rising and falling empires, each empire achieving a peak of irrigation, population, and political organization and a temporary florescence, but giving way to a subsequent period of dark ages.

The Iron Age gave the Old World a revolutionary technology, but, as iron tools cannot increase water supply, the irrigation areas were little affected, except as they fell under the empires of the north Mediterranean. Iron Age cultures developed in the forested areas of Europe, which had been exploited only with difficulty under the old technology. The New World never reached an Iron Age in precolumbian times. Instead, the Spanish Conquest brought it an Iron Age culture from the Old World, and native culture development was abruptly ended just after it had entered the Era of Cyclical Conquests.

The above formulation is rough, cursory, and tentative. It applies only to the early centers of world civilization. The eras are not "stages," which in a world evolutionary scheme would apply equally to desert, arctic, grassland, and woodland areas. In these other kinds of areas, the functional interrelationship of subsistence patterns, population, settlements, social structure, cooperative work, warfare, and religion had distinctive forms and requires special formulations.

The principal grounds for questioning the present formulation will, I suspect, be that diffusion between the centers of civilization in each hemisphere can be demonstrated. The relative chronology of the eras (Chart II) fits a diffusionist explanation perfectly. The essential question, however, is just what diffusion amounts to as an explanation. There is no doubt about the spread of domesticated plants and animals and little doubt about the diffusion of many technologies, art styles, and details of both material and non-material culture. Proof of diffusion, however, lies in the unique qualities of secondary

features, not in the basic types of social, economic, and religious patterns. The latter could be attributed to diffusion only by postulating mass migration or far-flung conquests.

If people borrow domesticated plants and agricultural patterns, it is evident that population will increase in favorable areas. How shall dense, stable populations organize their sociopolitical relations? Obviously, they will not remain inchoate mobs until diffused patterns have taught them how to live together. (And even diffused patterns had to originate somewhere for good and sufficient reasons.) In densely settled areas, internal needs will produce an orderly interrelationship of environment, subsistence patterns, social groupings, occupational specialization, and over-all political, religious, and perhaps military integrating factors. These interrelated institutions do not have unlimited variability, for they must be adapted to the requirements of subsistence patterns established in particular environments; they involve a cultural ecology. Traits whose uniqueness is proof of their diffusion are acceptable if they are congruent with the basic socio-economic institutions. They give uniqueness and local color, and they may help crystallize local patterns in distinctive ways, but they cannot per se produce the underlying conditions of or the need for greater social and political organization. It is therefore possible to concede wide diffusion of particulars within the hemispheres and even between the hemispheres without having to rely upon diffusion as the principal explanation of cultural development.

We have attempted here to present a conception of culture and a methodology for formulating the regularities of cultural data which are consistent with scientific purpose. The data are those painstakingly gathered and arranged spacially and temporally by culture history. Thorough attention to cultural differences and particulars is necessary if typology is to be adequate and valid, but historical reconstructions need not be the sole objective of anthropology. Strong observed that "The time is coming when the rich ethnological and archeological record of the New World can be compared in full detail and time perspective with similar records from Europe, Egypt, Mesopotamia, India, China, and Siberia. When such comparative data are in hand the generalizations that will emerge may well revolutionize our concept of culture history and culture process over the millennia."<sup>63</sup> Any generalizations or formulations must be subject to frequent revision by new data, for, as Kroeber remarks,<sup>64</sup> "Detailed case-by-case analyses are . . . called for if interpretations are not to become vitiated over generalizations which more and more approach formulas." At the same time, it is obvious that the minutiae of culture history will never be completely known and that there is no need to defer formulations until all archeologists have laid down their shovels and all

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<sup>63</sup> Strong, 1943, p. 34.

<sup>64</sup> Kroeber, 1940, p. 477.



ethnologists have put away their notebooks. Unless anthropology is to interest itself mainly in the unique, exotic, and non-recurrent particulars, it is necessary that formulations be attempted no matter how tentative they may be. It is formulations that will enable us to state new kinds of problems and to direct attention to new kinds of data which have been slighted in the past. Fact-collecting of itself is insufficient scientific procedure; facts exist only as they are related to theories, and theories are not destroyed by facts—they are replaced by new theories which better explain the facts. Therefore, criticisms of this paper which concern facts alone and which fail to offer better formulations are of no interest.

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