SOIL AND SOUL -- LAND AND LIFE

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Since the beginning of civilization humanity has been concerned with the land that supports human life. At times the land seems bountiful and kindly, and again harsh and unyielding, but it is always a challenge to human strength and ingenuity and people have learned to adapt their ways accordingly. Human needs extend far beyond what nature unassisted can furnish. People must plow and sow, must work with nature and conduct her producing forces through carefully organized channels. From the accumulation of experience and knowledge, they gradually learn to bend natural forces to advantage, and thus reduce the hazards of life and lessen direct dependence on natural environment. Thus it is through the use of techniques that civilized peoples produce their particular necessities.

Yet no matter how complicated become these techniques, social or individual, the fundamental fact of the technique we call agriculture continues to involve the relationship between humanity and the plant and the soil in which it grows. The very responsiveness of soil to techniques is one of its unique characteristics, individual and finite. Unconsciously, there is adjustment to these physical requirements, individually and collectively. Daily life, work and play, from the simple acts of life to the more complicated economics mechanisms created, are conditioned by the necessities of one's landscape. The agricultural techniques employed are basically designed to produce a relationship of soil to plant suitable to human aims. Persons and societies are thus products of the landscape.

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To the peoples of antiquity, the unity of human and soil was the great primary fact of existence. "And the Lord God formed man of the dust of the ground," it is written in the biblical story of Creation. This thought runs like a refrain through the Old Testament. Throughout the ancient world this feeling of kinship to the soil was expressed in the various bread-and-corn religions. The Egyptians called themselves "sons of the black earth." For many years the most popular religious cult of ancient Greece was the worship of Demeter, goddess of the earth, who not only determined the resurrection or destruction of the soul, but was revered also as the founder of law, the family, and the state. Plowing was vaguely regarded as an act bordering upon impiety, to be expiated by religious observances and the offering of sacrifices to the divinities of the earth. Such religious observances contained a deeper philosophy of the relationship of humans to the soil. Intuitively, they anticipated some of the scientific knowledge of the modern era; they recognized the soil as a living thing, deriving its energy from the sun; they recognized the principle of male and female in the growth of vegetation; they held the life and fertility of soil, plant, animals, and humans to be one and indivisible. Crude though these beliefs were, they nevertheless penetrated closer to the truth than the pseudo-sophistication that has all too largely determined the modern attitude toward the land.

The progressive industrialization and urbanization of life has limited the economic perceptions of an increasing number of people to the environment characterized by suburban residential developments and city slums, giant skyscrapers and vast industrial plants. They have tended more and more to conceive of the production of wealth in terms of people and machines alone, forgetting the land.

Nevertheless, the base of the social pyramid rests today where it has always rested -- upon the land. Upon the land humans make their first application of productive effort-to-

extract from it food to sustain life and give energy, fiber for clothes to protect the body and conserve its vital warmth, wood to build shelter against the elements, and ore from which to fashion tools.

The work of fashioning the natural materials into forms serving human wants, of exchanging them and transporting them, must follow on the work of extracting them from the earth. As the arts of production advance, the division of labor multiplies, and the whole industrial process increases in complexity and size. But no matter how big and complex it becomes, every human engaged in productive effort, no matter how far removed from the actual tilling of the soil, is working, in the last analysis, on the land. Nevertheless, many people seem to think that, because the apex of the pyramid has grown higher, the base has been lifted from the land.

The facts that proportionately fewer people are engaged in the primary extractive processes as the arts of production advance, that primitive barter is replaced by a vast and intricate system of exchange based on monies and credit, and that we talk in terms of billions of dollars rather than in hundreds -- these facts do not, and cannot alter the basic relationship of humankind to the soil. Like the dust that forms our bodies, everything we work on or with, everything we buy or sell, everything we use in any way comes originally from the earth and goes ultimately back to the earth. That is nature's cycle, and our puny devices cannot alter it. We can create nothing *ex nihilo* and destroy nothing utterly. We cannot add so much as a grain of sand to the universe or subtract one from it. All we can do is change the form and the location of natural materials to our advantage or disadvantage.

The basic character of civilization has been determined largely at the agricultural frontier. The harsh realities of the frontier sift and winnow old values, attitudes, and institutions, keep those which are relevant under new circumstances, and

replace those which are not, by new sets of values, new concepts of life, new institutions for organizing human effort. At the frontier, the values of individual independence and of performance as the measure of worth are built into a structure of institutions which organize individual effort into group action, which channel private incentive into public purposes, which expand human capabilities by providing individuals with meaningful mechanisms through which they can in some measure control their own destinies. As these values and institutions are transferred into the cities by the city-ward migration of rural people, they are adapted and modified to meet the needs of their new environment and solidified to form together with their parent rural institutions the hard skeleton of modern urban life.

As presently developing countries enter into accelerated programs of economic development they will perforce enter also into a period of social and institutional changes -- changes as demanding and profound as those which lay ahead of the earlier forebears of the developed nations of the world. As in the early years of those nations, the basic social and political character of emerging nations is now being forged at their agricultural frontiers. Agricultural development of these countries involves different types of frontiers to be sure, a pushing back of present scientific and technological rather than geographic frontiers. But massive adjustments of old institutions and creation of new values will just as inevitably result from bridging the time gap of centuries of technological progress as they did from crossing a continent and subduing the forest, prairies, and deserts.

The technology and improved efficiency of modern agriculture are as fabulous as the conquest of outer space, and they are far more significant for the welfare of humanity. Yet, as we marvel at what has been wrought from the land in the application of science and technology, we are aware that serious economic and social problems have been generated by these achievements. Under

the twin spurs of advancing technology and economies of scale, thousands of people leave the land for the city. In the United States the net migration from farm to city was heaviest during the 1950's, when it averaged 800,000 persons a year, and the trek to the cities persists at a rate of well over 100,000 annually.

To a very substantial degree, the problems of our cities are created by the migration of people who, once they decide to leave the land, do not automatically turn into skilled, or even semi-skilled factory employees. The challenge to government, to business, to education to help these urban newcomers get an education, jobs, and decent place to live is obvious. Governments, national and local alike, have one hopeful answer -- industry. Here and there industry heeds the call. New plants are being located in rural areas; income or sales taxes are eliminated. Tax-free bonds which use local credit to attract industry to areas of labor surplus have been offered.

In the long run direct governmental help to agriculture's castoffs as they stream from country to city may be required. This help might take the form of retraining for new jobs, including income or support payments during the retraining period. It might take the form of counseling services before, during, and after moves. It might include some financial help for the direct moving costs. And lastly, it might include some modest supplementary income payments for a limited term in the new location to facilitate the pains and pressures of change. Governments might also consider shifting financial aid programs from commodity price supports to farm income, and the tying of this support to people rather than to land: funds for early retirement programs for presently active but older farmers, aid to residents of small rural towns which are dependent primarily upon agricultural supply businesses for their existence, cooperative programs for restricting rural land settlement patterns and rural social services, and a direct attack on rising land prices.

The foregoing suggestions on how government may aid people in dealing with the problems of obtaining livelihood from the land come from agricultural researchers and planners in universities. No agency of society has contributed more to understanding of the soil and how best to manage for survival than these institutions. It is about their role that I shall direct my concluding remarks about land and life.

For more than a decade I have been challenging our institutions to broaden their concept of agriculture. No longer should they define agriculture solely in terms of the fields which grow our crops and the pastures and ranges which produce our livestock. They must change their definition to include *all* land -- cultivated land, grazing land, forest and wild land, the desert and the open land adjacent to cities. It must also include the waters in lakes and streams. I have also suggested that agricultural scientists and planners broaden their concepts. In the past they have generally concentrated attention on the allocation of resources as these affect agricultural production and the marketing of food and fiber. They must now extend their thinking beyond these objectives and consider how farmers and urban people can live and work together, each obtaining full use of natural resources and each paying his fair share.

When we look at projections made by leading agricultural researchers on the land that will be required to produce the food for the world's rapidly expanding population, we are confronted with a myriad of complex, conflicting questions on land use. Among them are: How can we adjust agricultural resources to provide maximum benefit for society as a whole, but with minimum hardship for a few? Since lands currently not in production, but well suited for production, should be available for use by future generations, what type of cost sharing will be equitable and feasible? What are the best uses of this land that one day will go into production? Do we need new types of property arrangements to shift lands to best uses for an intermediate period?

It has been estimated that in the United States alone expanding population will continue to substract approximately one million acres of agricultural land annually for urban development. Any expansion of this magnitude creates inequities, particularly in the rural-urban fringe. What method of taxation is equitable in a mixed residential-agricultural area? How can the aesthetic value of open space be preserved?

Again, estimates have been made that the demand for open space for recreation alone will increase ten-fold in another five years. The potential market for recreational use of agricultural land is almost untapped. Research is needed to answer such questions as: What are the demands? What are the dimensions of both demand and supply? How can farmers sell recreational privileges to an urban society which looks upon these as an inherited right? If recreational privileges are to be kept free, how can farmers be reimbursed for the use of their land and its wildlife? Do we have a trespass problem? What is it? How do we solve it? These and many other questions must be answered satisfactorily if agriculture is to develop its full recreational potential. The areas of inquiry are almost limitless. How will automation affect living and recreational habits of our citizens released from many types of work?

And in an entirely different field, what are the social sciences discovering about the human need to be physically linked with nature? Agricultural science as a whole has developed remarkably in several parts of the world, but in a piecemeal fashion. Especially there has been only a beginning in the application of the social sciences to problems of agriculture and the people on the land, and already there is a danger of application attempting to go beyond the basis of fact that must support it. World agriculture consists of many agricultures. Problems related to the whole can be stated only in the most general terms. Reference to particular regions, and above all to individual farms, must be based on specific knowledge. What is

learned in one region may have little application in another. Too many of the ideas we have now are generalized from too few particulars, and are inspired more by books than by land; and too many of our books are written simply from other books, not from studies of actual lands and the problems of people who live on them.

Humans live and must work to supply needs in an environment that is both social and physical. All of the land in the country could be made to produce crops, and there is none that will produce without labor. What land will be used at any moment, with what techniques, and with what success, depends upon the social and economic frame of reference within which people work, as well as upon the physical environment. Every time the economic and social conditions change, a new physical problem is created, and each time a new technique is developed, a new economic question appears. New problems for both the physical and social scientist will arise as long as society changes. And when society ceases to change, the end will have come. Students of agriculture are coming to this realization. Land studies in an economic vacuum and economic studies in a physical vacuum compete for uselessness as contributions to a solution of our land problems.

There is more serious thinking today about the way we humans occupy the landscape than ever before, and a new science is developing. At my university we call it Social Ecology. It represents an interdisciplinary effort to apply scientific methods to the analysis of a wide range of problems arising out of the complex interactions among persons and their physical and social environments. The term "social ecology" has its roots in the work of natural scientists who studied the natural selection and adaptation of species by observing the behavior of organisms in their actual habitats. This method was founded on the assumption that organisms are best studied in nature where they function as complex systems comprised of other living and

nonliving entities. Subsequently ecological analysis was extended by social scientists to the study of human behavior. While it is still too early to prophesy how rapidly the development of this science will proceed, evidence is beginning to accumulate which indicates that this multidisciplinary field of study which combines the natural sciences, the social sciences, the health sciences, and the law is producing answers to a number of human problems that should enable us to occupy the land in the most satisfying and rewarding way ever known.

Once again the university is serving as the instrument of society that enables us to effect an ethically and economically sound relationship between our social institutions and our land and in that soundness and stability assure the harmony and security upon which all other relationships in the social order depend.