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SOCIAL ENGINEERING IN A PHYSICAL WORLD — Dr. Vernon C. Finch

It is probable that the remarks addressed to the graduating classes of this college for most of the years of a century have admonished those about to leave the campus that they enter the world at a crucial moment. Perhaps I have as much excuse if I voice the same sentiment. ~~for the one hundredth time~~. It is indeed a somewhat appalling time for young people who must face a world of muddled affairs to which they have in no way contributed. Yet the time carries a clear challenge to the utmost ability in constructive thinking.

It is no news that, whether we are still in the midst of an economic depression or happily are emerging from it, we are in an era of strident social discord. Neither time nor the depression have taught men and nations to compromise their differences and live together without mutual irritation. It is not merely the scholarly fraternity that is aware of this fact. It is a topic for pertinent discussion wherever men meet. Causes of the confusion are analyzed and curative measures are proposed whose directions and merits vary in accordance with the social backgrounds, political beliefs and general competence of the persons who talk about them. General discussion of these matters is itself a valuable by-product of the period but it does not settle much.

From this vast amount of talk certain ideas stand out that well may be considered seriously by the young man of scholarly ambition. In whatever words they are clothed these ideas rise to point a finger of popular accusation at the sciences, both physical and social. The physical sciences are, by implication, blamed for having contributed to the present misfortune of the world. They are supposed to have upset the status quo and, by

their discoveries of things and processes to have destroyed jobs and contributed to a maldistribution of wealth. The social sciences are blamed for their lack of foresight and for not saving the world from the consequences of too rapid change. Popular opinion asks, "Are the social scientists not in command of the laws of economics? Is it not their place to guide the ship of state by the compass of history and the chart of sound social and political practice"? This kind of criticism may be ill-founded but let no one think it a mere public fantasy that deserves no attention. Its affect is already measured in terms of millions of dollars of shrinkage in public support of research and teaching in the fields of the sciences. And this has come just at a time when a sound public confidence should have resulted in doubling that support in order the more quickly to gather the facts and evolve the principles that might rescue society from its pitfall. To whatever degree this popular lack of confidence is deserved it is at least time for scientists to examine their relations to each other and to society with open minds and have the courage to make such adjustments in their public relations as may be indicated.

Certainly there is lack of coordination between those who study and those who administer public affairs; between those whose business it is to find facts and those whose business it is to apply those facts to the betterment of the social order. It is a lack that should give pause to those who turn fresh from a college career to enter the world of business and politics upon the one hand or upon the other to go into the world of academic investigation. It appears that the facts of physical science are multiplying at a rate so fast that their very natures are known only to a few specialists. The social implications of these new facts are usually unknown and too often not even considered by their discoverers. The real nature of social

reaction to the new ideas and inventions becomes known too late to permit the development of any means of prior social adjustment. In this field the events of history are no adequate guide. Scientific advance of the modern sort has little historical precedent.

It is upon a world of unexpected stresses that we look, a world where new failures appear in the social structure before the old are repaired, a world of questions without answers and of answers without questions. In the field of physical science we are flooded with new inventions before we are aware of any need for them, while in the field of social relations scores of pressing questions find no solutions and new questions rapidly appear. Permit one illustration.

Chemical research recently has perfected and there is now on the market a synthetic substitute for soap. It is created in a laboratory factory out of raw materials that never knew farm or forest but are based upon the chemical complexity and stored energy of coal. It was developed in the laboratories of a huge corporation noted for its ability to look forward in the field of physical science. But was any social warning given that here was a new thing in prospect, a thing that might have social repercussions? Not at all. It is now dumped into the lap of an unsuspecting society with a gesture which says, "Here is something new! This is progress!" I know it is fine that we have the ability to create new things. Progress we must have. But we have passed the point where it may be assumed that any new invention is of itself good. Certainly this one illustrates well the further strain that may be placed upon the balancing abilities of an already-staggering social structure. A substitute for soap it is with adequate cleansing powers, effective in both soft and hard waters. Suppose the unrestricted advertising campaign now in force brings it into wide use. A first repercussion will be felt by

the corn and cotton farmers whose products of lard, tallow and oil are the domestic mainstay of the soap business. These farmers, in distress, already are the objects of solicitation and financial aid on the part of our national society as represented by government. A second repercussion will be felt by foreign producers of bean and palm oils. International balance of trade and exchange will be complicated further. Domestic manufacture will feel the shock also. Depression in soap manufacture will affect unemployment in many cities and the labor requirement of the new industry will not take up the slack in the old even if the labor were mobile and interchangeable. Furthermore, the chemical nature of the new product which makes it usable with hard water enables it to strike an economic blow at all those industries now engaged in providing the public with an array of chemical preparations and mechanical devices for changing the reaction of hard waters to soap. Unexpected blows at industry bring strain upon our financial structure which is passed on to the creditor class. So both worker and creditor are likely to suffer.

Thus we see that one commercial product, which almost within a month has pushed its head above the horizon so inconspicuously that the majority of people are not yet aware of its existence, and a hundred more like it, past, present and future, hold problems that need solution. Certainly the solution does not lie in the direction of a legal prohibition of change. In about the year 1790 the pack horse owners of western Pennsylvania sought legal protection against the widening of trails into roads lest wagons destroy their business. It is useless to try to stop the wheels of progress. But, perhaps it would be to the advantage of society if the vehicles of progress carried signals to warn a pedestrian society and sets of brakes which might be applied at critical moments to permit society to adjust its position on the highway.

Here it appears are specific questions that confront young men and women today; questions to which someone must find answers. First. Is it possible for the physical scientist to give reasonable warning of changes about to come and to interpret in advance the probable meaning of those changes and the directions of their social impingements? Certainly, up to the present it has not seemed possible. New ideas have a way of appearing without warning and new things with inconspicuous or even inauspicious beginnings have a way of developing large proportions. However, the fact that no way yet has been found to give warning of impending scientific and social changes does not mean that it can not be done. The second question. Provided that the social scientist can be given adequate warning, can he develop in organized society a sufficient sensitiveness that it may quickly shift its political and economic deployment the better to meet the coming shock? Obviously, there is now little attempt to conduct the battle on that plan. Rather, there is a definite social lag behind scientific advance. Or, perhaps one should say that physical science sets such a fast pace that society can not even keep abreast, much less lead the race. Here is a challenging field for the social sciences. How, by legal device, shift in public opinion, or in any other way, may a society comprised of millions of human individuals and their multiform political and economic institutions, rooted in the past, be kept stable and at the same time made mobile?

We shall likely wait long for the answer to that question and in the meantime there may be some expedient that may be used to protect a society somewhat overgrown, untrained to the fight, unable to coordinate its muscles and already reeling a bit from a recent succession of blows. I raise a third question. Is it possible to control or delay the release of certain kinds of invention upon society and thus pull the punch and soften its demoralizing

shock? Answer in the affirmative to this question implies the creation of a form of autocratic social or political authority capable of exercising such control. There are some who believe, apparently, that an answer of that kind must be the permanent solution of the question. There is, in some quarters, a growing disbelief in the capacity of society to proceed to order its activities upon the basis of popular reason. Is that perhaps the underlying significance of the rapid spread of dictatorship in Europe and, one might almost add, America? Does dictatorship indeed mean that society has lost faith in democracy or may it mean the exact opposite; viz., that society believes more than ever in order by popular reason as expressed in the person of a manager? Your answer to that question depends upon your personal philosophical background and your outlook upon life.

I wish to direct my remarks now toward a phase of social organization closer to my personal interest. I refer to the idea of a planned economy as it applies to the use of the land. I mean not alone the cultivated soil but the whole exterior of the earth upon which we live and in association with whose features we make our farms, grow our forests, dig our mines and build our cities and their interconnecting avenues of communication. The land in that broad sense is a complicated thing. It is the entire complement of our physical world of environment comprised of expanse of area, configuration of surface, character of soil, nature of resources and condition of climate. Each of these elements expresses itself in many forms which in turn combine and recombine into a multitude of associations each with a composite character having its own individuality. It seems obvious that the settlement and use of these lands of varied character should have been recognized from the first as problems requiring regional investigation and conclusion as a guide to public policy. Yet nothing could be farther from the history of practice in America.

The problems of the land, like those in the fields of the social impingements of science, have been left mainly to chance for solution. The economic spirit of rugged individualism and a governmental spirit of laissez faire accompanied the pioneer in his quest for land, the lumberman and the miner in their exploitation of the earth's accumulated reserves of wealth and the real estate dealer in his promotion of cities and their growth. The result of such an attitude was, as might be expected, inevitable conflict of man with nature as well as man with man. I am concerned mainly with the conflict of man with nature, and its avoidance. There exist now in America many problem areas. They are areas of social dislocation. Some of them are on a gigantic scale, in which lack of harmony between the forms of social development and the nature of the physical world has brought economic distress and restricted opportunity to hundreds of thousands of individuals. The complicated nature of these social dislocations almost defies description and no more than a couple of illustrations in paint may be attempted.

When in its progress across America the wave of pioneer farmers reached the margin of the high plains it did not falter but pressed steadily on. The country looked about the same and no Federal officer stood at the threshold to say "This is a different land". Indeed, in official Washington there was so little understanding of the land and its limitations that settlement was encouraged and not even the land allottment per family was changed. It was assumed that if a quarter section of Iowa prairie could support a family so could a like amount of Colorado prairie. But nature had decreed otherwise. No one saw in crossing it that vague line which separates land with just enough rain to raise farm crops from that with not quite enough. No one knew that the region with just too little rain was afflicted with periods of years of less than normal rain alternating with periods of years

with more than normal, or that protracted drought could be accompanied by devastating pests or violent winds that could remove the powdery soil of plowed land to the depth of the furrow. But these facts were learned soon enough and by sad experience on the part of thousands of helpless settlers. Eventually the wave of population receded leaving wrecked fortunes and broken lives in its wake, only to return again and again. A few wet years brought fortune to those who remained. Abandoned lands, bought cheaply, were sold to the hopeful who came from the East and in the end these were broken by the natural conditions to which the laws of man should have been adapted for the protection of the settler. In this land was born a spirit of rebellion and discontent that still is a political force in the nation. It is when the books of America balance in red ink that our rugged individualism appears for what it really is, the desire to be left alone to work out our own fortune so long only as we are sure that the fortune is good. Only after the damage was done in the high plains was information sought or were correctives applied. Laws were changed to give the settler more of this natural grazing land that he might support his family by means to which the land is best adapted. Surveys were made to discover what land is suited to the plow. Any comprehensive plan for social engineering in that region must rest upon a clear understanding of the physical limitations of the land including the details of its climatic environment.

The same is true also of that region known as the Appalachian bituminous coal field. There is an area of perpetual social unrest and distress. It is one of the sore spots in the American body politic. In this instance nature has not been niggardly. Rather, one of the basic difficulties lies in an embarrassment of natural wealth. There layer upon layer of coal lies exposed upon a myriad hillsides, good and easily accessible. The coal is easy to win and the area of its occurrence is vast, extending from Penn-

sylvania to Alabama. It is the richest coal field in the world but its use has introduced social problems as yet unsolved. A surplus of marginal mines provides a basis for ruinous competition. Various States and widely separated railways engage in competitive production and haulage. An erratic continental climate produces a strong seasonal variation in demand. In consequence of these and other conditions growing out of the natural region come many social problems. Of continuous employment for miners there is little. A depression in price closes some mines for months. The miner can seldom turn to part-time agriculture because his physical environment is one of narrow valleys and steep hillsides. His employment at dangerous work in isolated underground galleries makes him an extreme individualist and he does not readily adapt himself to factory or other group employment. When he is out of employment he exists where he can not live, camps where he can not reside and idles or fights where he can not work.

Here clearly are problems beyond the scope of the miner, beyond the ability of the coal company or even of the State involved. A Federal plan is needed but it must, in any attempt to guide the destiny of a whole class in American Society, take full and early account of the physical characteristics of that part of the land it concerns.

These cases, hastily sketched, illustrate but two of the many groups of problems in social engineering that confront the modern generation. There is no intent on my part to imply that these and many kindred problems in the physical-social field are being neglected. They are being studied from a hundred angles by a veritable army of workers in an attempt to solve some of the pressing aspects of the various dilemmas that confront us. Some of the attacks are new and the results are unknown, others have been years in progress and have yielded notable returns. But such problems have a way of increasing

faster than the solutions until, at the moment, the burden of accumulated uncertainty, of social dislocation, of economic poverty in the midst of physical abundance is endangering the whole national structure. Perhaps, amidst all the soul searching that is now in progress, it is time to re-examine the mode of approach to these questions relating to the use of the land and its resources for the benefit of the whole social order.

It will be observed that the serious work done thus far in the fields of land use, the management of our natural resources and the ordering of economic relations to the land has proceeded from the standpoint of critical problems rather than critical regions. We have our groups of trained workers dealing with the problems of the national forests, the problems of our inland waters, the question of soil management and the prevention of destructive erosion. We have agencies whose thought is directed toward the ordering of our social interrelations through the study and management of a great variety of social institutions such as highway development, public utilities and the distribution of industry. Despite our profound respect for the ability of workers in these fields and in spite of their notable accomplishments we are faced with the conclusion that the results of their various endeavors are not what we might have expected when they are expressed in terms of a nicely-integrated, well-ordered and progressively-better social development.

There is a lack of integration of the findings in these various fields of science and an apparent inability to bring knowledge to bear upon the whole of the complex problem of living in a region. It seems that our production and use of knowledge is too highly departmentalized to be quite socially effective. There is a tendency on the part of the physical scientist to consider first the possibility of accomplishing a project and later, if at

all, the social desirability of it. There is something fundamentally wrong with the application of knowledge to the ordering of human affairs when a noted and socially-minded scientist can be called into consultation by government on the possibility of constructing a Boulder Dam but is given no opportunity to express any opinion as to the economic desirability of the undertaking. Yet such occasions are common enough.

The departmentalization of knowledge is understandable from the viewpoint of the research scholar and even from that of the teacher. It is when departmentalized knowledge is applied administratively to the solution of the current problems of the land that its limitations become apparent. From it arise obvious cross purposes. All of us know of some of them. The administration of the public forest, admirably done as it is, is based upon principles which here and there bring the use of land for forest into conflict with the better use of land for some other purpose. The current government attack upon the soil-erosion problem develops in some places methods which hardly can be considered for the best interests of the region in which the work is done. The attack upon the unemployment problem has led to the construction of roads and dams and other costly structures which are ill adapted to the real needs of their respective regions.

In all this scurry to solve problems there seems a large element of confusion which results from the attempt to apply departmentalized knowledge to the solution of the integral problems of specific communities. It could hardly be otherwise. The departments of learning are so extensive that it is utterly impossible for any individual, or small group of individuals, to harmonize all their parts for administrative use in an area so great and diverse as the entire United States. Perhaps there is a better way to administer for the public good the knowledge provided by the experts. Let research in forestry continue in the field of the forester and research in

highway construction continue as a branch of engineering but let us change the manner of administering the results. We have groups of experts, each of which is concerned with a particular phase of economy over all the land. Let us ~~substitute for~~ supplement them with groups of administrators each of which is concerned with all the problems of land and life in a limited portion of the country. The limits of a distribt to be administered by one group should be set so as to include as little of diversity as possible in order that each may be indeed a region of common problems. Let each group of regional administrators work for the slow and ordered development of its region whose problems they come to understand in their interrelation. Let them seek constant aid and knowledge from the departmental experts on the one hand and let them work in cooperation with established political authority, federal, state, county or local, on the other hand. Further, let these regional administrative groups be coordinated one with another in an interregional body which shall guide their several activities toward harmonious interregional relations and to the best national interest. This would be indeed a form of regional planning but a form which would disturb as little as possible and make effective use of existing sovreignties both in the realm of special learning and that of political affairs. It would offer the advantage of an integrated attack upon all the critical ills of a region by men who knew the region as a whole and as it can not be known by the various scientific experts trying to minister to its various ills each from his own special viewpoint.

The plan suggested certainly involves a change from our laissez faire economy, but the nation is afflicted with serious illness and drastic remedies are indicated. However, the plan is not without precedent. The first move in that direction already has been made by the establishment of the Tennessee Valley Authority. That particular case suffers from the dis-

advantages of a first attempt. It appears to have been endowed with too much power and too much money. It appears to be attempting to bring about change too rapidly and to be proceeding with too little regard for the comparable development of other regions. Regional planning to be effective must also bring interregional harmony and proceed not by revolutionary but by evolutionary change.

An excellent example of a region in need of coordinated planning is found nearer home than the Tennessee Valley. The States of Minnesota, Wisconsin and Michigan all include generous portions of that part of the national area commonly known as the Northern Out-Over. It is well known to most of us as a vacation land but also it is a land of problems and, despite the fact that it lies in three different states, it is a region of common problems. These problems relate to denuded forest lands, sub-marginal and tax-delinquent farm lands, stranded mining communities and decadent lumber towns. Why should a land that is alike be managed differently because it lies in different states, counties or townships? Why should forest experts advise the political authorities to deal with a parcel of land in one way, agricultural experts advise its use in another and those who promote the industry of recreation in still another? Each specialist knows his own department of learning as it applies to the region but none of them know the region in all its departments. To arrive at such an understanding is the job of a lifetime. The region must be known from the inside. It must be lived in; it must be felt for and felt with.

Already the abilities of these problem areas of America to lift themselves out of their difficulties by the time-honored means of the local political governments has broken down. The scientific specialists offer advice, but have little ability and less power to afford coordinated administration. Where are these regions to turn for administrative guidance. Now they

turn first to the State and then to the Federal governments. Their problems are dealt with largely in terms of expedients. The measures are evolved, in large part, and put into effect by sets of constantly-changing political officers. The methods are revised or reversed with change of political mood and even at the same moment differ widely on either side of state, county or even township lines. Greater stability is needed.

If a regional system of land-use administration could now be instituted whence could the administering officers be drawn? There is an important crux of the matter. The positions would require men of great ability and integrity. Their functions would be capable of grave abuse. Men of sterling qualities of character would be needed. Yet, as matters now stand, the places likely would be filled by political appointment and the cure might well be as bad, or worse than the disease. After all, the solution of the economic ills of the land will be in terms of a personnel as well as in terms of a method. Herein lies the challenge to government in America and individually to the young men and women who are today leaving the colleges of the land. We need in America a profession of public administration; a profession as clearly recognized and aimed at as are now the learned professions and politics; a profession with an esprit de corps and a morale as highly developed as that of the profession of medicine. Britain has such a group of public servants who yearly are recruited from the best in brains and personality the colleges have to offer. Their financial rewards are not great but they are blessed with a sense of security resulting from social approval of the importance of their tasks. They are public servants for life but their work is the administration of important public affairs.

Great advances might be made in healing the ills of our problem areas if we could evolve a flexible regional system of administration, train

up a competent group of administrators, divorce them effectively from the uncertainties of politics and give them time to carry out their work. Such men would need to start at the bottom of the ladder, each in his chosen area, and demonstrate his ability in social engineering in a definite physical environment which he grew to understand. They would need to be wise in their seeking of scientific aid and opinion, sound in their judgment of constructive measures, deep in their knowledge of regions and people, broad in their tolerance of political and legal restrictions and sensitive to the relations of their regional problems to those of other regions. The task should command the best in brains, ability, personality and integrity and would require no small measure of altruism. I am convinced that some form of planned regional economy is the logical means of correcting certain glaring inabilities to harmonize scientific advance with social progress. Movements now under way indicate that a social-economic tide is setting in that direction. I predict its early and disastrous failure if it is left to political promotion and administration. I recommend both the cause and the task to you for consideration. In this, as in other good causes, the spirit of noblesse oblige applies as well to him who inherits through education the mental wealth of the ages as to him who inherits the nobility of a family tradition.

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