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THE SOCIAL SCIENCES AND NATIONAL PLANNING[1]

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AN impression prevails in many minds that social science has made out a case against national planning, at least in economic matters. This impression is the vestigial remnant of what used to be a vigorous belief. English political economy arose as a destructive critique of the national planning done by mercantilist statesmen and as a constructive argument for a policy of *laissez-faire*. But since Adam Smith published "The Wealth of Nations" in 1776, economic practise and economic theory have been evolving rapidly, each acting continuously upon the other. Present opinions upon national planning are the outcome up to date of these historical developments in the field of practise and of theory, which I shall sketch as briefly as I can.

I

The aim of mercantilist planning was to mobilize economic forces for national aggrandizement. The country should have a numerous population; the common people should be trained in husbandry and the crafts, inured to labor and kept from the consumption of luxuries that are merely pleasant, such as sugar and tea. The necessaries of life should be produced at home as a precaution against foreign attack; the mercantile marine should be fostered as an auxiliary of the navy; an abundant supply of the precious metals is desirable both for home trade and as the sinews of war. To guarantee this supply countries that have no mines of gold and silver must see that the balance of trade is "favorable." To that end, exports should be encouraged, and imports discouraged, except in the case of commodities destined for resale abroad or of raw materials for domestic manu-

[1] Address as retiring chairman and retiring vice-president of the Section for Social and Economic Sciences, American Association for the Advancement of Science, Pittsburgh, January 1, 1935.

factures. Private enterprise should be directed toward industries that the government is trying to develop on national grounds; colonies should get most of their manufactured goods from the home country and send raw materials in return; foreign commerce should be supervised to make sure that merchants comply with the national plan.

Of course this scheme of statecraft involves national economic planning of an elaborate, continuous sort, calling for eternal vigilance on the part of statesmen and tending to develop into detailed regimentation of economic life. The occupation a youth may choose, the apprenticeship he must undergo, the wages he may receive, the places in which he may live and work, the commodities he may consume, the products which his master may make, the technical processes to be followed, the standards of materials and workmanship to be observed—these are but samples of the matters which mercantilism sought to control in its heyday.

This type of national planning grew up as centralized states emerged from the confusion of feudalism, and prevailed with numberless variations of detail over Central and Western Europe for two or three centuries.[2] At many points, the mercantilist regulations stood in the way of enterprising money makers, or even created opportunities to make money by breaking the law—for example, by smuggling. Hence the system tended to break down in detail whenever the administration of the laws grew lax for any reason. Certainly in England and her colonies, private disregard of mercantilist regulations became a mass phenomenon in the eighteenth century. Nor did the authorities try hard to stop all infractions of the law. One may say that *laissez-faire* was practised on a considerable scale before it was preached as a formal doctrine.

Adam Smith was not the first, but he was the most effective critic of mercantilist planning. His argument can be summed up in a syllogism: first, every individual desires to increase his own wealth; second, every individual in his local situation can judge better than a distant statesman what use of his labor and capital is most profitable; third, the wealth of the nation is the aggregate of the wealth of its citizens; therefore, the wealth of the nation will increase most rapidly if every individual is left free to conduct his own affairs as he sees fit. There need be no fear that consumers will be exploited under such a system; competition among producers is a sufficient safeguard against that danger. To make gains for himself each producer must offer goods which others want at prices set by competition. Thus, in pursuing his own gain, every producer is led to promote the public interest.

By formulating this argument with the authority of a moral philosopher, Adam Smith offered his contemporaries a justification of acts which thousands had been performing with a bad conscience. The "rationalization" lent new vigor to private disregard of hampering regulations and so contributed toward the breakdown of mercantilism. It is hard to-day to realize how Adam Smith clarified the minds of men and lifted their hearts with his ringing call to adopt "the simple and obvious system of natural liberty." His was a great service to blundering humanity during the difficult transition that lay so near at hand. And that service was accepted with a promptness which has few parallels in the history of thought. Far more rapidly than he had supposed possible, Adam Smith's views were adopted by other thinkers, by business men and by statesmen. Supplemented by the philosophical radicalism of Jeremy Bentham and his disciples, restated to fit changing conditions by later economists, *laissez-faire* became the dominant maxim of British economic policy and exercised a powerful influence upon thought and action throughout the western world. We may almost say that for two generations the British government planned to to have no plan.

II

Economists no longer celebrate "the simple and obvious system of natural liberty" after the sweeping fashion of Adam Smith. Social organization has become vastly more complex than it was in the eighteenth century; business planning and government planning have become closely intertwined with one another; discussions of their rôles in guiding economic activities now deal with the diversity of conditions produced by a century and a half of the industrial revolution.

Even while they were in process of assimilating the doctrine of *laissez-faire,* the English people began using their government as an agency for correcting what they thought to be bad results of private enterprise. Some of these governmental controls could be defended by a shrewd interpretation of Adam Smith's logic. Thus laws to protect child workers and presently laws to limit the hours worked by "young persons" and women could be defended on the ground that minors and women of any age were not in fact the best judges of what is good for them. Public opinion came to believe that it was foolish to permit even grown men to take the risks of overloaded ships, unfenced machines, ill-ventilated mines, or occupational diseases, however accustomed they might be to do so, and successive parliaments passed laws to re-

[2] Any brief sketch of mercantilist policies must be schematic to a degree. The present sketch is probably least misleading as a representation of the policies which Colbert sought to carry out in France.

duce industrial hazards of many sorts. If the mass of the wage-earners were as blind to their economic interests as the Malthusian principle of population represented them to be there was reason for tutelage in many matters. Compulsory education came to seem an obvious need. The industrial revolution called for operatives who could read blueprints and clerks who knew arithmetic. Democracy, the political complement of economic liberty, demanded literate citizens. Accordingly, the government went much further than Adam Smith recommended in providing education at public expense and forcing parents to accept it for their children. Adam Smith had justified state provision of public works; the list of such works grew with the density of population and scientific knowledge of public hygiene. The rise of the gas industry, of railroads, of tramways, of the telegraph, the telephone, electric lighting and power transmission built up a great class of public utilities midway between the fields of private enterprise and public works. These utilities could not serve the public cheaply and efficiently under such competitive conditions as worked well in manufactures and trade; they were "natural monopolies," and as such they could be subjected to special regulation, or even owned and operated by governments that professed the doctrine of *laissez-faire*. Presently, it began to appear, though more strikingly in the United States than in Great Britain, that in many industries competition was breeding combinations. The joint-stock company, which Adam Smith had thought of as limited by its own competitive inefficiency to a brief list of trades requiring vast capital rather than active enterprise, proved admirably adapted to the factory age with its heavy investments, once the principle of limited liability had been accepted. Incorporation made it easy to organize business enterprise in units large enough to dominate whole industries. Once more, government intervention could be justified on familiar grounds. Adam Smith had taken it for granted that the consumer, for whom he felt tender solicitude, would be protected against exploitation by competition among numerous producers. If that was ceasing to be the case, it seemed logical that government should break up the monopolistic corporations and force the fragments to compete again.

So far I have mentioned governmental actions intended to remedy what were thought to be bad results of business planning or to supply social needs for which business planning made no adequate provision. I go on to list various shortcomings of business planning that are troubling our minds to-day, shortcomings which government is often called upon to correct or to supply.

A specter that has troubled men's minds more and more as the industrial revolution makes headway is the rapid depletion of natural resources. In 1865 W. Stanley Jevons pointed out that the fixed limits of coal deposits made it impossible that Great Britain should long maintain its current rate of increase in industrial output. Somewhat later Americans began to feel apprehensive about their supplies of lumber, natural gas, oil and other minerals. Now we are becoming dimly fearful about the loss of soil fertility through reckless methods of cultivation and erosion. The appalling wastes of natural resources that are going on seem due largely to the policy of handing over the nation's heritage to individuals to be exploited as they see fit. It appears that business planning takes and must take a relatively short period of time into account—a period that is but as a day in the life of a nation. What is rational on the basis of this short-run private view may be exceedingly unwise on the basis of long-run public interest. We see now how vital a factor Adam Smith overlooked in taking the nation's wealth as the aggregate of the wealth of its individual citizens. And what can be said about the wasteful use of natural resources by private enterprise can be repeated with increased emphasis regarding the use of human resources. Private enterprise draws thousands of youths into "blind-alley" occupations from which they emerge little fitted to assume the responsibilities of mature life. The work it provides for millions of adults fails to make use of their full capacities and leaves many the victims of "balked dispositions." We have allowed our immediate economic interests to lead us into modes of living which fail to satisfy our emotional needs and our creative impulses.

Experience is showing also that, great as are its contributions to social welfare, business planning has a formidable array of technical limitations of which we are becoming increasingly conscious as the years pass and as our ideas of what is possible to mankind grow more daring.[3]

Business planning can secure effective coordination of effort only within the limits of each independent business enterprise; that is, each group of business activities subject to a single financial control. It can not effectively coordinate the activities of independent enterprises.

Coordination within an enterprise is the result of careful planning by experts; coordination among independent enterprises cannot be said to be planned at all—rather it is the unplanned result of natural selection in a struggle for business survival. Coordination within an enterprise has a definite aim—the making of profits; coordi-

[3] In the following five paragraphs, I venture to reproduce with minor changes passages which I contributed to the "Report of the National Resources Board," pp. 81, 82. Washington, Government Printing Office, December, 1934.

nation among independent enterprises is limited by the conflicting aims of the several units. Coordination within an enterprise is maintained by a single authority possessed of power to carry its plans into effect; coordination among independent enterprises depends on many different authorities which have no power to enforce a common program, except so far as one can persuade or coerce others. As a result of these conditions, coordination within an enterprise is characterized by economy of effort, coordination among independent enterprises by waste.[4]

The planning of business enterprises aims at making money. If the ultimate test of economic efficiency is that of satisfying the most important social needs in the most economical manner, then business planning must be warped by inequality in the distribution of income. Where a few have money enough to gratify almost any whim and where many can not buy things required to maintain their efficiency or to give proper training to their children, it can hardly be argued that the goods which pay best are the goods most needed.

From the view-point of business itself, planning to make money is a precarious undertaking that often ends in heavy losses or financial ruin. However skilfully the internal affairs of a corporation are managed, the whole venture may be wrecked by circumstances beyond the control and even beyond the knowledge of the managers. As markets grow wider, investments heavier and financial interrelationships more complicated, it becomes harder for the ablest management to anticipate the conditions which the next few years will bring forth. The movement toward business combinations is largely a business man's remedy for uncertainty—his effort to extend the number of factors which he can control. But combination by one group of enterprises increases the hazards for other enterprises. It is not surprising that with growing frequency business men have turned to the government for aid and demanded that it protect them against hazards which they can not control, including the hazard of combinations among other business men.

The frequent recurrence of economic crises and depressions is evidence that the automatic functioning of our business system is defective. In view of recent events no one longer holds that the business cycle is being "ironed out." Instead, it appears that the difficulty of maintaining the necessary equilibrium among different factors in the enormously complicated mechanism is becoming greater rather than less. Aside from the widening of markets and the growth of combinations mentioned above, we face the fact that an increasing part of the annual output consists of semi-durable goods which people can stop buying for a time if times are bad. The drift of population from farms to cities and the diminishing dependence of farm families upon what they can make for their own consumption, their increasing dependence upon selling farm produce to get the wherewithal for buying other goods, mean that general economic maladies afflict more people more seriously than they did in past generations. Business planning has found no effective means of preventing the growth of these factors that tend to make the business-cycle hazard more serious.

When a grave depression occurs, recovery is retarded by the divergence between the policies followed by powerful corporations in highly organized industries and the policies that are forced upon small producers in simply organized industries, of which farming is much the most important. Formerly, when a depression came, prices fell in almost all markets. This decline proceeded until the resulting checks upon production and stimulations of purchasing produced a new equilibrium between the demand and supply of most commodities at prices lower than those prevailing during the preceding phase of expansion. Then business activity began to pick up again. The revival came about automatically: business men had merely to look after their individual interests, and government to remain a passive spectator, or at most to increase its allowances for the support of the poor. Of late, this automatic process of recovery has become less prompt and effective. The managers of great corporations usually believe that the best way to minimize their losses during a depression is to maintain prices, despite the heavy falling off in sales and production which is likely to follow. That policy will at least cut down the heaviest items of current expense —cost of materials and wages. But farmers, who individually can exercise no control over the prices of their products, must continue to produce as much as they can and to sell for what they can get in a community where many consumers have lost their jobs. Because their incomes are cut by low prices, the farmers can not buy freely from the corporations that are keeping their prices relatively high. Because farmers, other small producers in a similar position and their former employees who are now out of work can not buy freely, the rigid-price corporations have small inducement to increase output and put men back to work. Recovery under such conditions is a far slower and more halting process than it was when all prices were flexible in much the same degree.

If business men are justified in demanding that government take measures to protect them against the hazards of trade, how much stronger justification for

[4] See Wesley C. Mitchell, "Business Cycles: The Problem and Its Setting," p. 172. National Bureau of Economic Research, New York, 1927.

such a demand have wage-earners! The day when it was plausible to argue that steady work comes to steady workmen is past. Sobriety, industry, thrift will not enable a man to keep his job if the company which employs him shuts down. Nor is it his fault if he can not get a new job promptly when there are ten applicants for every opening. Cyclical unemployment is the labor side of the business-cycle hazard, and, as said above, that hazard is not shrinking. Technological unemployment is the labor side of industrial progress and that hazard is growing. Economic security for wage-earners, much the most numerous class of people in a commercial nation, certainly has not been provided by business planning.

Finally, we are often told nowadays that, even in the best of business years, our present economic organization prevents us from making full use of the technological skill we have attained and of the capital we have accumulated. As a rule, statements of this sort are vague and sweeping, better calculated to arouse interest than to convince a skeptic. But recently two efforts have been made to get more definite ideas about the margin by which actual production at the peak of prosperity falls short of what production might be if we could make full use of our facilities. In 1933, twenty-eight engineers of experience in various industries were persuaded to submit estimates of how much the aggregate output of all industries might be increased simultaneously with existing equipment and methods, provided a ready market could be assured for the products. More than half of the estimates ran above 25 per cent. Asked what increase might be expected if the equipment and management of all industries were "brought to the level of the best current practise" half of the engineers gave estimates of 60 per cent. or more. Second, an elaborate statistical study of the proportion of the country's capacity for production that was utilized in 1925–29 has yielded similar results. The conclusion drawn was that, taking the full gamut of operations from agriculture and mining, through manufactures and transportation to retail distribution, it would have been feasible to produce nearly 20 per cent. more goods than we did by the methods then in use and with the equipment and labor we then possessed.[5] Thus the charge that our economic organization fails by a wide margin to secure the full use of our productive capacity even in years of business activity is sustained by both of these inquiries. An increase of a fifth or a quarter in the national income above the highest levels yet attained seems to be technologically feasible merely through fuller use of the equipment and methods in use. If the engineers are right, these increases might be doubled or trebled by bringing equipment and management in all enterprises abreast of the best current practise.

To draw up a list of errors and omissions under business planning is not to damn private enterprise. Few dispositions seem to me more misguided than the disposition to regard business as a monster which prevents suffering humanity from attaining its heart's desire. After all detractions are made, the historical fact remains that, in the countries which have given wide scope to private initiative since Adam Smith presented his momentous argument for *laissez-faire,* the masses of mankind attained a higher degree of material comfort and a larger measure of liberty than at any earlier time of which we have knowledge, or under any other form of organization which mankind has tried out in practise. These blessings of relative abundance and freedom arise from the rapid application of scientific discoveries to the humdrum work of the world, and that application has been effected mainly by men who were seeking profits. In societies organized on the basis of making money, *laissez-faire* put the stupendous drive of private gain behind the industrial revolution. Further, the capital required for building machines, factories, railroads, steamships, electrical equipment and the like was accumulated mainly from profits made by business men and investors and used, not to satisfy their own wants, but to provide new equipment for production. As Adam Smith argued, in pursuing their private gain business men were led to promote the public welfare.

III

Yet no class in the community has been satisfied with the workings of private initiative. From capitalists to farmers and working men, all of us have tried to use government as an agency for bettering economic organization. The way in which government should be used has been the central issue of our political struggles more often than the question whether government should be used at all. For few of us have been willing to trust what Adam Smith regarded as "natural" forces. Instead, we have cherished ambitious designs of harnessing social forces much as we have harnessed steam and electricity.

Nor have these attempts been fruitless. The familiar contrast between the rapid industrial progress since James Watt invented the separate condenser and the slow social progress since Watt's friend Adam Smith published the "Wealth of Nations" is often exaggerated. England in 1934 is a very different society

[5] See "Economic Reconstruction," Report of the Columbia University Commission, pp. 87–104, New York, 1934; Edwin G. Nourse and Associates, "America's Capacity to Produce," pp. 415–425, Washington, 1934.

from the England of 1776, and the difference is not limited to technology. For example, the working-class babies of this year will have educational opportunities which were closed to their ancestors; their choice of occupations will be wider; they will work fewer hours; their livings will be more secure; they will dwell in less hideous and more healthful towns; fewer of them will be maimed at work or contract occupational diseases; their span of life will be longer; they will be free to unite with their fellows in promoting their common interests; they will have a share in governing their country. These advantages they will owe to the long series of social reforms which have been enacted one after another, and which these babies of 1934 will have a better chance to extend in their turn than had the working-class babies of 1776.

But considerable as the advances effected in social organization during the last century and a half have been, the pace has been less rapid in this field of effort than in the field of industry. To explain this cultural lag is not difficult.

First, the social sciences which are needed to guide efforts to control social forces are less precise and dependable than the natural sciences which guide efforts to control natural forces. That difference in the character of man's knowledge in these two fields is due to the vastly greater complexity of social phenomena, and to the conditions surrounding research in the two fields. In the one field experiments can be tried within the limits set by expense; in the other field experimentation is not wholly barred, but it is narrowly restricted.

Second, applications of social science to practical affairs rarely promise a personal profit to the innovator. At most he may dream of being honored by his fellow men.[6] Still more rarely can a second advance be financed from the proceeds of past successes. Thus the drive of profit, which gave such energy to the industrial revolution, has not pushed forward the social revolution. The Communist Manifesto told the workers of the world in 1848 that they had "a world to gain" by uniting; but this vague incentive to millions was a less effective spur to action than the concrete prospect of profits to individuals. And now that the workers of one country have captured the government and begun an experiment in communism, the workers of other countries seem inclined to wait for the gains to materialize before imitating the Russian example. Also the process of initiating industrial improvements is far simpler than the process of initiating social improvements. Any innovator who could command a modest capital might adopt what he believed to be an industrial improvement without more ado. If his faith proved justified, he could coerce his competitors to follow his example under penalty of commercial ruin. The innovator who wants to secure what he believes to be a social improvement must convince many men before he can secure a trial of his plan, and for convincing men he must rely upon persuasion. More commonly than not, the projected change threatens some vested interest, and the would-be reformer's campaign of education has to meet a well-financed counter campaign. The social innovator can not coerce anybody until he has won government; the industrial innovator brings coercion to bear upon his competitors as soon as he begins to undersell them. Finally, experiment plays a rôle in the applications of science not less important than its rôle in scientific discovery. Again the advantage is all on the side of the natural as opposed to the social sciences, of industry as opposed to social organization. Social like mechanical inventions are usually crude at first; both types need to be perfected in detail before they will work well. In industry this process of improving upon the original design is facilitated by practical trials on a small scale before large risks are taken. In social organization similar experimental runs are sometimes feasible; but often that is not the case. Nations must try many innovations upon a large scale or not at all; the crudities of the first plan must be discovered at heavy cost and eliminated by a process almost as halting as the process of inducing government to make the first venture.

[6] Of course this remark does not apply to all efforts to secure governmental action. The advocates of a tariff bill, for example, may expect and achieve substantial profits. But legislation promoted for private gain is seldom an application of social science to practical affairs.

IV

Beset by so many difficulties, social planning has run a most uncertain course during the last century and a half, while the industrial revolution has been marching forward. In England and the United States most of the attempts to use governmental agencies in new ways have been piecemeal efforts started by private citizens to remedy some single bad situation. Philanthropists have played the leading rôles in many of these efforts; in others, groups that felt themselves aggrieved or oppressed have provided the spokesmen. To get what they wanted, these leaders have had to use the arts of propaganda and organization directed to the one specific aim in view. England has produced two great groups of thinkers who developed systematic programs of social reorganization—the Philosophical Radicals in the opening decades of the 19th century and the Fabian Socialists in the closing decades; but in so far as their plans have been carried out, it has been on the empirical

basis of one thing at a time and mainly through men who did not count themselves members of the groups in question. In this country it is hard to find even one group of systematic planners to set beside the Benthamites and the Fabians.

A less numerous but more imposing class of national plans are those that have been drawn by governments to meet grave emergencies. The most striking examples are the economic mobilizations effected during the world war and the efforts of President Roosevelt's administration to cope with the great depression. Other governments have been bolder in trying to change the social organizations of their peoples. Perhaps the most demonstrably successful case of systematic government planning which the world offers is that of Japan. When the Shogunate was abolished and the Mikado was restored to power in 1867, the responsible statesmen of the country deliberately undertook to transform their feudal realm into a modern commercial state with the standard accompaniment of military power. How rapidly they have progressed toward this end within the short space of two generations every one knows. Bismarck's plans for German development are the most notable European achievements of pre-war days in constructive government planning. Of course we can now add to the list the grandiose experiments of communism in Russia and of fascism in Italy.

Both types of planning that have prevailed in this country—efforts to solve one problem at a time and efforts to meet national emergencies by quick action —have grave defects. The piecemeal method overlooks the interdependence which is so important a characteristic of social processes. Change one feature of social organization and you are certain to change many other features also. Some of the changes you did not plan you will not like. For illustrations, recall the results that flowed from the thirteenth amendment to the constitution abolishing slavery and from the eighteenth amendment that sought to abolish the liquor traffic. It is only by very careful study of the social situation as a whole that changes can be made with a maximum of beneficial and a minimum of harmful effects. As for emergency planning in the face of impending disaster, it is certain to be defective in many ways just because there is not time enough to use what wisdom we have.

Critics of both the piecemeal efforts of reformers and of the inspirational efforts of statesmen acting in a hurry can make out a strong case against much if not most of the national planning we have done in this country. But any one who attempts to check the practise of national planning will argue in vain. So long as men have power to think, private citizens will go on devising plans for what they find amiss in social organization, and some of their plans will win general approval. Also, so long as we continue to encounter national emergencies from time to time, our government will go on adopting hurried measures. The course of wisdom is not to oppose national planning, but to make that planning more intelligent. The more clearly any man grasps the enormous difficulties of the task, the more sharply he realizes the harm done by poor planning, the keener he should be to promote intelligent plannning: for national planning of some sort, or rather of many sorts, we are certain to have.

The two great improvements needed in American planning are recognition of the interrelationships among social processes and preparedness to deal seriously with social problems before they have produced national emergencies. It is possible of course that our future reformers will have a wider field of vision than their single-eyed predecessors. It is possible, also, that our government in future will be more alert to coming troubles even when times are good. Let us hope so. But may we not also set ourselves to organize our intelligence for a systematic consideration of social problems and how they may best be solved?

An organization devoted to these aims we have never had; for no President and cabinet can take time from their pressing executive duties for systematic long-range planning. Such planning is a task that demands the full time and energy of the ablest men in the country. And the abler these men, the more eager they would be to secure the services of a varied technical staff and the counsel of a wide circle of advisers. Indeed, a competent National Planning Board would conceive itself, not as depending upon its own wisdom, but as an agency for focussing the intelligence of the nation upon certain issues, in the hope of formulating plans that would command sufficient confidence among their fellow citizens to be given trials. It is only as an advisory body that such a board would fit into the American scheme of institutions. A large part of its task would be to draw the line between cases in which government should seek to exercise control and cases in which private initiative should prevail. To preserve the effective liberty of the individual in the modern world requires national planning of as shrewd and elaborate a sort as the planning required to check abuses or to supply lacks. Indeed, it is only by preventing one group of citizens from exploiting other sets and by supplying those services which private enterprise can not render that individual liberty can be secured.

How much a National Planning Board with advisory powers might improve upon our efforts to solve social problems by taking thought no one can tell in advance. What I have said about the difficulties which beset the social sciences warns us that suc-

cess is not a foregone conclusion. To supply deficiencies in knowledge the board would doubtless have to undertake much research through its own staff or through other agencies. But after doing its best to lay a scientific foundation for its plans, the board would often have to advise proceeding in an experimental fashion on the basis of probabilities. It would be doing pioneer work; for it would be trying to better the social organization of one of the most advanced countries in the world—to do things which have not yet been done. Hence it could not expect to achieve as brilliant a record as did the elder statesmen of Japan, who were seeking to pull abreast of other nations and so had models to imitate. And of course the usefulness of the board could be wrecked by the appointment of men chosen for partisan reasons. Or a board of men possessing technical competence but lacking in other qualities might antagonize the Executive, Congress and the public, and so lose its influence. Perhaps the idea of trying to mobilize the intelligence of the country for systematic and continuous study of social problems will be rejected by public opinion. But it would seem that we have had enough experience with reforms that produce almost as much harm as they remove to be willing to try a more scientific method of dealing with social problems.

SCIENTIFIC EVENTS

THE AGRICULTURAL PROBLEMS OF MEXICO

THE special correspondent of *The Christian Science Monitor* writes from Mexico City that the 35,829,500 acres of arable land can not be cultivated until the population has reached at least 30,000,000 inhabitants. This statement, made in a recent study by A. Lozcano, agricultural engineer, and regarded as an argument that Mexico should let down its immigration bars, followed closely upon the recent publication of a symposium by a group of Mexican technicians, of which Señor Lozcano was one.

The symposium, entitled "The Agricultural Problem of Mexico," according to the correspondent, was issued at a time when other effects of Mexico's preoccupation over problems of population and their relation to more organized and efficient production were beginning to show themselves.

One instance was the announcement of plans for the founding of ten new cities on different irrigation systems, and another the continued pace at which commonland-grants are being parceled by the government, a total number of 7,141 peasants having been provided with such parcels during the month of September.

The problem of improving means and methods of better cultivation are said to have been greatly exaggerated in Mexico. That phase of the question is secondary compared with that of increasing the agricultural and national population.

The ten cities to be constructed by the National Irrigation Commission on as many national irrigation systems in different parts of the country will represent a total outlay of about 5,000,000 pesos, or an average of 500,000 pesos each.

The new centers will be modeled after the agricultural city, Anahuac, built last year on National Irrigation System No. 4 in the northern part of the country, and which now has a total population of about 5,000. They will include complete water, drainage and light systems, well laid out streets, office buildings, shops, warehouses, post office and telegraph service, branches of agricultural banks for colonists and common land-grant owners and hotels.

The purpose of the new cities is to provide a more comfortable way of living for the thousands of colonists and to give them the benefit of more modern social and educational advantages.

When work now being carried on at different systems is concluded, 728,945 acres of land will be under cultivation. Every system has its chain of highways and roads connecting it with important distribution centers. According to the report, the efficiency with which this work has been carried on and the systems put to practical use are superior to those shown by similar services in other countries.

Plots are obtained by immediate payment in full, or by promise-of-sale contracts of two types, short and long-term—the latter covering a period of from 24 to 25 years.

THE LINDBERGH COLLECTION OF SPORES IN ARCTIC AREAS

COLLECTIONS of micro-organisms which Colonel Charles A. Lindbergh made on his flight through the Arctic areas in the summer of 1933 are described in the January issue of *The Scientific Monthly,* by Fred C. Meier, senior agriculturist, U. S. Department of Agriculture, with field notes and material by Colonel Lindbergh. Mr. Meier has been studying air-borne organisms for several years—particularly those that drive northward over the plains each year to spread rust in the wheat fields. He interested Colonel Lindbergh in making this contribution to the scientific work of the department, and together they worked out new and improved apparatus for taking samples of the micro-flora of the Arctic air.

Colonel Lindbergh devised a spore trap which he