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*SOME PRESENT PROBLEMS IN AGRICULTURE.**

AGRICULTURE is now in a transitional stage. It is passing from the old to the new. It is pupating. The problems are great, and they all have a forward look.

Most of these problems are incapable of solution quickly. They must ripen and mature. They are many; this paper proposes to indicate only a few of them that appeal most to me.

The problems of agriculture are of pressing importance, both to agriculture itself and to the public welfare. They are of two kinds: (1) the technical problems of the business, (2) the problems of adjustment to the affairs of our growing civilization.

The problems of adjustment are of the greatest public concern, because agriculture is our greatest occupation. Agriculture is necessary to civilization. Of all occupations, it employs most men, most capital and is followed in the most places. It probably must always employ from one fifth to one fourth of the people of any self-sustaining nation. There are super-

* Paper read by L. H. Bailey before Department 18, Section on Agriculture, of the International Congress of Arts and Science, St. Louis, September 24, 1904.

numerary, eleemosynary and parasitic occupations; but agriculture is basic.

Other occupations have had their day in the public appreciation. All of them have been born out of agriculture. Tubal-Cain was the descendant of Adam. The greatest of public problems are to come with the rise of the agricultural peoples. Just because it is basic, agriculture has been conservative and patient. Fundamental strata are likely to be azoic; but in great world-movements they are also likely to rise permanently to the top.

The farmer is a wealth-producer. Therefore, his importance in the body politic is primary. He deals with elemental forces. As a wealth-producer, he will come to have a larger voice in the expenditure and waste of wealth in maintaining armaments of war. All his instincts are of peace.

The public problems of agriculture have been slow to gain recognition. The agricultural questions that we customarily discuss are those of the individual farmer. The burden of our teaching has been that the farmer must be a better farmer. Only in recent years has it come to be fully recognized that agricultural problems are of the greatest national and governmental significance. Consider how recent is the Land Grant Act, the secretaryship of agriculture in the President's cabinet, the experiment station act, the origin of a definite farmers' institute movement, the development at public expense of fertilizer and feed controls and other policing policies, the making of liberal grants of public money for specific agricultural uses.

Governmental fiscal policies have been shaped primarily for other occupations, as, for example, the tariff for protection. This is primarily a manufacturer's policy. It matured with the rise of concentrated manufacturing. One of the stock arguments of the protectionist when addressing farmers is that any policy that aids manufacturing interest must indirectly aid them. I am not here to discuss or to criticize tariff legislation, but it is apparent that such legislation is only secondarily of benefit to agriculture. It has been the history of institutions that special and organized interests receive attention before care is given to the common people and the masses.

We have really not endeavored, as a people, to solve our technical agricultural problems until within the present generation. We have escaped the problems by moving on to the west. Thereby we have fallen into the habit of treating symptoms rather than causes, as the policeman does when he orders the offender to 'move on,' and leaves the real difficulty for some one else to solve. Even yet, farmers are moving on to find land that is not depleted and regions free of blights and of pests. The real development of agriculture lies in developing the old areas, not in discovering new ones. When virgin land can no longer be had, scientific agriculture will be born. An isolated island develops something like a perfected agriculture, as one may see in Bermuda or Jersey. The earth is an island: in time it will be developed.

As agriculture comprises a multitude of different businesses, everywhere touching many sciences and having contact with many public questions, so it is impossible for one person adequately to state even its present and pressing questions. I have been in the habit of inquiring of farmers, students and colleagues what they consider the agricultural problems to be. Many of the problems that they have stated to me are temporary, local or incidental. Others are common to many occupations, having to do with the general constitution of society and the general trend of economic events. In this paper I have tried to assemble statements of such questions as appear to me best to illustrate the complex nature of the subject before us. I wish I

could give credit to the sources of all the suggestions, but this is impracticable, even though in some cases I have followed very closely the ideas and the language of my informants. I shall be obliged to assume full responsibility for the statements.

THE TECHNICAL AGRICULTURAL PROBLEMS.

In America the so-called problems of agriculture have been largely those of the mere conquest of land. They are the result of migration and of the phenomenal development of sister industries. They have resulted from a growing, developing country. They have been largely physical, mechanical, transportational, extraneous—the problems of the engineer and inventor rather than of the farmer. The problem has not been to make two blades of grass grow where only one grew before, but how economically to harvest and transport the one blade that has grown almost without effort.

During the past hundred years there has been an area of development on the western border of the developed country, and this has been able to compete at an economical advantage with the older area farther east. The price of land has fallen in the east, while it has risen in the west. From 1870 to 1900 we practically doubled our population and doubled our agricultural area. Aside from the geometrical increase in the population, this development has been due to a fertile, level prairie which was practically treeless. Hitherto the axman has hewn his way tree by tree. The development of the area west of the Mississippi River is probably the most remarkable in the history of the world. A second cause for this development is the consolidation of railroads into transcontinental lines; and another is the improvement of labor-saving machinery, of which the self-binding harvester is the most conspicuous example, a machine that first attracted wide attention at the Centennial Exposition in 1876.

To this day the American is a cheap-land farmer. A few minutes on the train from a European city brings one into a highly tilled agricultural country. The other day I took an express train from New York city. It was three quarters of an hour before I saw what I could call a farm, and a full hour before I reached a farming country.

As early as one hundred years ago, a distinct movement for the betterment of agriculture had set in. This movement was largely educational. It was an effort to improve the farmer, quite as much as to improve the farm. Washington was vitally interested in the problem. He wished to have a central board or clearing-house for agricultural information. The full fruition of his hopes came with the establishment of a secretaryship of agriculture in the President's cabinet, in Benjamin Harrison's administration. In 1799 a concrete proposition for the establishment of an agricultural college in Pennsylvania came to an untimely end. In 1821 instruction was given in agriculture in the lyceum at Gardiner, Maine. In 1824 a school of agriculture was opened at Derby, Connecticut. A number of other similar attempts were made previous to the passage of the Land Grant Act of 1862, but of these only the Michigan Agricultural College persists. The gist of the whole movement was to adapt education to men's lives. The culmination was the Land Grant Act, the purpose of which is 'to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.' So far as agriculture was concerned, the Land Grant Act was somewhat premature. The developing and organizing mechanical and engineering trades were the first to profit by it. Agriculture will now have its turn.

The tide to the limitless west rose and fell, and we came to a pause. The technical problems of the farmer called for solution. His personal difficulties pressed for solution directly on the farm. These problems are of two categories: (1) to remove the special disabilities (insects, fungi, weeds, animal diseases), (2) to augment production (fertilizers, soil studies, tillage, improving plants and animals). Then was born the experiment station (in 1887): the idea is to improve the farm; it is investigational, not educational.

How special the purpose of the experiment station act is, may be seen at once from the purposes that it definitely mentions:

> That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states or territories.

The experiment stations are holding to these special fields with great faithfulness. In a lot of three hundred and fourteen bulletins that came to my attention bearing the date of 1903, the following rough classification of subjects was made:

Bulletins, 1903.

Insects, diseases of plants	63 or 20%
Feeding and grazing	52
Fertilizers	37
Farm crops	33
Fruits, orchards	28
Dairy (milk and cheese)	23
Diseases of animals	16
Meteorology	15
Garden vegetables	12
Sugar	7
Natural resources, irrigation	7
Poultry	4
Weeds	4
Ornamental plants	4
Seed germination	3
Educational	3
Forestry	2
General advice, bees exhibitions, plant-breeding, etc	1
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Some epochs are now passing—as the fertilizer epoch based on agricultural chemistry. The larger question of self-sustaining farm management is now pressing. Three categories of technical farm subjects are just now beginning to demand much thought: (1) problems of feeding to increase efficiency of farm animals; (2) problems of breeding of animals and plants for the same purpose; (3) problems of the business organization of the farm, or the development of a farm-plan. We are beginning to apply research to large fundamental questions. The earlier subjects of investigation in the agricultural experiment stations were mostly the smaller and incidental ones. Now the fundamental or backbone crops and products are being investigated in their entirety—the corn crop, the cotton crop, the grass crop, the milk product, the beef product. The experiment stations are originating a kind of constructive investigational method, and the really great questions are ahead of us. Large problems come last.

We are now just coming to the large question of adaptation of special areas to

special purposes. In the future one of the problems will be the more perfect adaptation of the kind of farm to soil and climate. As an illustration, the production of domestic animals for meat and for wool has been most extensive on the western border of the developing country for economic reasons, and not because the area is naturally best adapted to this enterprise. The Mississippi valley is primarily adapted to the production of cereals and not nearly as well adapted as the north Atlantic states to the production of grass either as pasture or hay. These Atlantic states are particularly adapted to growing all kinds of trees and of grass. In the course of time, therefore, we may expect that the production of live stock will become more important in the east. Out of this grow some immediate problems. At present, live-stock husbandry in the east can be carried on economically only when large tracts of land can be purchased at low price. It is possible to purchase small tracts of land at comparatively low price, but not possible to purchase large areas. More of the live stock will be raised upon small farms within the more densely populated districts, with comparatively few animals to a place. This will lead to the question of maintaining the improvement in domestic animals. It will mean the gradual substitution of soiling systems for pasturing systems, and this will lead to remoter economic and social changes.

New industries are to be developed. This calls for special governmental recognition. The national Department of Agriculture aids such new enterprises by giving counsel and investigating the special technical difficulties; but is this kind of aid sufficient? If the government helps new manufacturing industries by giving them special privileges, why not aid new agricultural industries by bounties? If a bounty system were to become a recognized public policy (following perhaps the experience with sugar bounties), would it result in undesirable social and economic changes? The money grants to agriculture are only a fair offset to special privileges given to other industries.

THE SOCIAL AND ECONOMIC PROBLEMS.

We are now returning to the farmer, although still holding to the farm. There is a distinct recrudescence of the educational point of view. The new emphasis is to be placed on the man rather than on his crops. The farmer is a citizen as well as a farmer; he is an important factor in public affairs.

The new education must reach the farmer in terms of the whole man—his particular business, his home and its ideals, his relation to good roads, good schools, the church, to social forces, to all that makes up a broad and satisfying country life. We must give attention to the ideals of living, as well as to the ideals of farming. The sanitation of the farm home, the architecture of the buildings (what silent and effective teachers buildings are!), the reading, the character of the farmyard, the questions associated with the bringing up of children, the social and commercial organizations—these are the kinds of subjects that the rising educational impulse must attack.

All this enforces the economic and social questions relating to agriculture. The greatest problems of American agriculture are not the narrower technical ones, but the relations of the industry to economic and social life in general. Agriculture has not as yet been able to call to its aid in any marked degree those forces and tendencies which have culminated and been of such economic value in the general business world, in the great productive and distributive aggregations. The complete solution of the economic ills of American agriculture may not be in cooperation, and yet in both the productive and distributive phases

this is perhaps the most apparent remedy. Cooperation in distribution has made a beginning, but cooperation in production is still almost unknown. Are Kropotkin's ideals attainable?

The problem of the supply of capital in agriculture has never been solved in this country other than in the most expensive way. Capital must return to the land. Two factors enter into the problem: (1) to demonstrate that capital can be made remunerative in farmed land, (2) to insure that land will not bear an unjust burden of taxation.

Closely associated with the economic side is the sociological phase. In the days when all were interested in agriculture, both school and church flourished, but in these later days both have lost their molding influence in the country, though the former shows signs of renewed activity vital to the community.

The specific economic and social questions that even now press for study are so numerous that they can not be catalogued in an address of this character. Is there still an active exodus from the country? If so, is the movement caused by purely economic conditions, or is it in part the attractiveness of the city? In other words, does the education of the farmer fit him for the appreciation of the esthetical and philosophical value of his environment? In what relations do the labor-saving devices stand to the rural exodus? Can it in any way be due to super-population of the rural communities? Are the rewards of labor greater in the city than in the country? Is the arrested development of country church and school in any way responsible?

What are the tendencies as to size of farms? Is the American, starting with small individual ownership, tending towards consolidation into larger units? Is the European, starting with large landlorded ownership, tending towards small individual units? Are the small farms decreasing in number? In what way does the development of the railroads and electric roads affect the size of farm properties? In what way do the labor-saving devices influence the size of farms? Could cooperation of farmers remedy any tendency towards large farms? Or, are larger farm units to be desired?

What can cooperation do for the farmer? Must it be economic, social, political, or to increase production? What are the moral and psychological effects of cooperation? What relation can cooperation have to the isolation of the farmer? To his hygienic conditions? Is it possible by means of cooperation to save small individual ownership of farms?

Is it true that the country promotes health better than the city? What are the diseases of the country? Are there mental diseases of isolation? Are most of the farmer's diseases due to his work, environment or poor intellectual preparation to meet the requirements of his condition? What could the state do for the farmer from a hygienic standpoint? What are the relations of farm water supplies to the prevalence of typhoid fever, and other diseases?

How is isolation to be overcome? By a hamlet system? Or by a distributive system of communication—as by better roads, trolley lines, auto-vehicles, rural mail delivery, telephones, traveling libraries, cooperative reading courses? Is the social life of the small village as vital and wholesome as that of the separated farm home?

These are only the merest suggestions of a very few apparent present problems. They are not to be solved by any *a priori* reasoning, nor by using the stock statistics and opinions of economists and sociologists. The field must be newly studied. New data must be collected. New means of attack must be developed. With much

painstaking, actual facts in detail must be secured. What is the actual social and economic status of every farmer in a township? a county? a state? Who knows? History must be studied from a new point of view. The very foundation of historical development is public opinion of the common people; and until within the past century the common man was the farmer. Agriculture is the basis of history. The best data of the actual conditions of the people antecedent to the French Revolution are found in Arthur Young's minute description of the agriculture of France. The historian of agriculture is yet unborn.

As an example of the inadequacy of our information on important economic problems, let me cite the most pressing problem just now confronting the American farmer —the question of farm labor. Farm labor is scarce; it is dear; it is inefficient; it is unreliable. Yet we read of the armies of the unemployed, asking for bread. Why? Who can answer? Who has the data? There seems to be not one authority to whom we can turn. It is apparent that these serious pressing problems—scarcity, expensiveness, inefficiency of farm labor—are only symptoms of some deep-seated mal-adjustment.

A large proportion of the labor on farms is done by the farmer himself or his growing family. The inability to find steady employment for laborers is a very difficult problem. Ordinarily, men desire to work all the time and to use their energy to the best advantage. A farmer's family arrives at the productive age when the parent is between forty-five and sixty. The farm does not offer opportunity for the sons because the father still desires to maintain his activity. The farmer does not take the boy into his business to the same extent that other business men do. The result is that the sons must find employment elsewhere, and in the nature of the case can most conveniently find employment on salary. By the time the father is sixty-five to seventy years of age and feels the necessity of giving up the farm, the sons are engaged in other lines of effort which it is not practicable for them to leave. The result is that the farm declines with the declining years of the father and upon his death is sold or becomes a rented farm. Occasionally a parent solves the difficulty; and herein a distinct public responsibility rests on the individual farmer.

Is the farm labor difficulty a too low wage-rate? Is farm labor inefficient merely because it is cheap? If so, how must the farm be made to be able to pay a rate in competition with other labor? Has the tariff contributed to the inequality? Is social poverty of the country districts a cause? Is the lack of continuity, or unsteadiness, of farm labor responsible? Has the decrease in the size of the farmer's family been responsible for part of the trouble? And if so, why has his family decreased? Must the farmer of the future raise his own labor? Must machinery still further come to his aid? If so, what effect will this have on systems of agriculture? Will the urbanization of the country tend to establish a regularity of farm labor? Will cheap railway rates from cities for laborers aid in maintaining the supply of labor for those living on the land, making it possible for them to find work during winter in some neighboring community (it has helped in some parts of Europe)? Can we develop a competent share-working system, in which the owner of the land still retains directive control? And if so, will social stratification result? Must there come a profit-sharing system? Or must the greater number of farmers themselves become employees of men of great executive ability who will amalgamate and syndicate agricultural industries as they have amalgamated other industries? Is the agricul-

ture of the future to be a business of fewer and larger economic units? If so, how will this affect the centers of population and the social fabric? Will the lack of farm labor force us more and more into 'nature farming'—the hay and pasturage systems? What is the farm labor problem?

The country as well as the city must be made attractive and habitable. It must express and satisfy the highest human ideals, else it will not attract the best men and women. In area and in population, the country is the larger part of the national domain; the improving of the ideals of the persons that live therein is one of our greatest public questions. The farmer is the conservative, not the dynamic, element of society. We live in a dynamic social age.

The farmer always will be relatively conservative. His business is rooted in the earth. In a thoroughly well developed agriculture, the farmer does not move his business rapidly from place to place. He remains, while others move on. Therefore, it is especially necessary that we extend to him all the essential benefits of our civilization. (I hope he will not care for the unessential benefits.) He has the rural free delivery of mails—although this was thought to be impossible a few years ago. Shall he not have a parcels post? Each year the good roads movement, originating at the cities, is extending itself farther into the real country. Trolley lines are extending countryward; soon they will come actually to serve the farmer's needs. The telephone, as a separate rural enterprise, is extending itself. Extensional educational enterprises are reaching farther and farther into the open farming districts. Cooperation and organization movements are at the same time extending and concreting themselves.

Farming stands for individualism as distinguished from collectivism. Farming enterprises will be more and more amalgamated and capitalized, but they can never be syndicated and monopolized to the same extent as many other enterprises. How best to preserve and direct this democratic individualism of the open country is one of the greatest questions now confronting us.

The art impulse will soon take hold of the country, as it has already laid hold on the city. We have lived all these centuries on the assumption that work of art is associated with buildings and 'collections.' As nature is the source of all our art, so the time is coming when we shall allow nature herself to express her full beauty and power. We shall go to nature oftener than to art galleries. We shall first remove objectionable features from the landscape—features for which man is responsible—such as all untidiness and blemishes, all advertizing signs, all unharmonious buildings. Then we shall begin to work out our enlarging aspirations with the natural material before us—make pictures with sward and trees and streams and hills, write our ideals in the sweep of the landscape and the color of the flowers. Our 'art' societies still confine themselves to imitation art. The great art societies will be those that give first attention to nature as it is, not merely as it its represented to be in plastic materials and in paints.

Of all the forces that shall revitalize and recrystallize the country, the school is the chief. The schools make the opinions of the nation. The city school has been developed, but the country school has been relatively stationary; yet every farm family is interested in the school. The farmer believes in schooling, just as completely as the city man does; but he may not be convinced that the schools are really touching the problems of life. Persons make more sacrifices for their children than for any other cause. Probably more

persons leave the farm to educate their children than for all other causes combined.

An ideal condition would be the total abolition of rural schools as such. The custom of setting apart towns and villages into special school districts in order separately to tax the town or village for school purposes has been a misfortune to the rural schools. The whole school system of any state should be organized on a broad enough basis so that every boy and girl, whatever the occupation of the parents, has the opportunity of securing the same, or at least equally efficient, education. The country mill has gone. The old-time country school is a passing institution. A one-teacher school is as inefficient as a one-man mill. Schools will be consolidated into larger and stronger units. The first pedagogical result will be the differentiation of the work of teachers—perhaps one of these teachers can give special attention to nature-study and country-life subjects.

The school must connect with real life. It will be one of the strong constructive and dynamic influences in our social organization. At present its tendency is receptive and passive, rather than creative. The particular subjects that shall be taught are of less importance than the point of view. Many questions of detail are to be discussed, often with much travail; but the final solution must be to allow every subject in which men engage to find its proper pedagogic place in a wider and freer educational system than the world has yet seen, and to place agricultural subjects with the others and not exclusively in institutions by themselves.

Whatever our doubts and misgivings, the American farmer is bound to be educated. He will demand it. Having education and being endowed with a free chance, he will not be a peasant. Some persons have made the serious mistake of confounding peasantry with comparative poverty. Peasanthood is a social stratum. It is a surviving product of decaying social conditions.

If the open country is to be made attractive to the best minds, it must have an attractive literature. There must be a technical literature of the farm, and also a general artistic literature portraying the life and the ideals of the persons in the country. The farm literature of a generation ago was largely wooden and spiritless, or else untrue to actual rural conditions. The new literature is vital and alive. The new, however, is yet mostly special and technical, with the exception of the growing nature-literature. Artistic literature of the farm and rural affairs is yet scarcely known. Where is the high-class fiction that portrays the farmer as he is, without caricaturing him? Where is the collection of really good farm poems? Who has developed the story interest in the farm? Who has adequately pictured rural institutions? Who has carefully studied the history of the special farm literature that we already have? Who has written the biological evolution progress that attaches to every domestic animal and every cultivated plant? We need short and sharp pictures of the man at his work and the woman in her home—such quick and vivid pictures in words as an artist would throw on his canvas. There is nobility, genuineness and majesty in a man at useful work —much more than there is in a prince or a general or a society leader, whose rôle it is to pose for the multitude. The man holding the plow, digging a ditch, picking fruit, the woman sweeping or making bread—what stronger pictures of human interest can there be than these? If I could have the choice of the mite that I should contribute to the developing and the nationalizing of agricultural sentiment, I should choose its literature.

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