

THE ADVANCEMENT OF EDUCATION IN AGRICULTURE.

by

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Agriculture, originally the tillage of the soil, is now applied in a broader sense to the practical scientific business of the farm, in all its details of tillage, crops, stock-raising and labor. The term "practically scientific" implies the application of the laws and principles of the exact sciences to the practice of the art of Agriculture.

Practical skill to be really successful must be guided by science, which is simply the experience of many men concisely arranged and systematized. There is always in a farming family an amount of useful information handed down from father to son which proves of much practical value. Notwithstanding this fact it is very essential that the farmer have a knowledge of all the sciences relating to Agriculture; such as horticulture, entomology, geology, zoology, soil physics, and chemistry.

Agriculture, considered in its crude state is one of the oldest of human occupations, dating from before the dawn of history. The savage who lived by the fruits and roots he found ranked lower in the scale than the hunter who lived by the chase. The herdsmen, although leading a wandering life, belonged to a higher grade of the human race than the hunter; but civilization in the true sense only began when men had settled habitations and tilled the soil for their sustenance.

The inhabitants of Switzerland are the oldest Agriculturists and stock-raisers known to us. Domestic animals were raised by these people centuries ago, and wheat, barley, millet, and flax seem to have been cultivated at an early age in the world's history, but old as it is, agriculture has only reached its present stage of development in recent years, and there are some wild tribes which have very crude methods and some who neither plow nor sow.

Egypt and Babylonia were among the great agricultural communities

of the ancient world and the leading principles of Agriculture were earnestly practiced by the Romans.

The Romans introduced their methods into the countries conquered by them, and after a long decline during the dark ages the influence of the Saracens in Spain greatly improved the agriculture of Europe. The monastic communities scattered over christian countries did a great deal to introduce improved agricultural methods on the large tracts of land in their possession.

Every civilized country has of course developed its agricultural methods, more or less directly according to its climatic and other conditions. Holland, Belgium, Germany, United States, and France are well advanced in Agriculture; Chinese agriculture is remarkable for the carefulness with which manure is preserved and economically applied to the best advantage. Austria and Russia are backward, but since the land is very fertile, it is productive.

Although Great Britain is the greatest manufacturing and mercantile nation in the world, agriculture is nevertheless the most important industry. Improvements in methods of agriculture have profited greatly by the increasing wealth of the people flowing in from other sources.

Improvements in Agriculture were considerable as far back as the sixteenth century; since then ancient systems have been replaced by improved methods. Much clay land is during recent years becoming unremunerative for grain crop cultivation, and being given back to pasture is now devoted to dairying, particularly in the vicinity of large cities, where the milk trade has enormously increased.

Booth and Bates have done a great work in improving the form and constitution of the two great Shorthorn families of cattle which bear their names today.

1756

The discovery of the value of concentrated or artificial manures brought about marvelous alterations in Agricultural Practice. Roughly broken bones were used with success in 1875. About 1844 Peruvian Guano came into use and within recent times Nitrate of Soda and Sulphate of Ammonia. These commercial fertilizers, however, are not used extensively in the West, because barnyard manure can be used with less expense and with better results.

The ground work and pillar of civilized society, upon which its prosperity, its solidity, and its glory rest, is Agriculture. Commerce is wholly dependent upon it and manufactures grow out of it. Our knowledge of farming has increased and has been steadily applied. Thousands of more or less important discoveries and inventions have been made, and every variety of grain and farm produce of whatever kind and live stock have been improved.

There is much room for advancement, however, especially in the way of conserving the fertility of the soil, which in many sections of the country is being recklessly wasted. Compared with England we are far in advance.

During the period of the Revolution farm production was brought to a standstill, and for some years after it was in a state of extreme depression. Gradually, however the importance of some effort to develop and improve the agriculture of this country was impressed upon the minds of the more interested and public-spirited of the people. The result of this deliberation was the formation of societies for the encouragement of agricultural improvements. The South Carolina Society was established in 1784, and the New York Society seven years later. Associations for the promotion of the science of agriculture are very numerous, embracing in their scope, the interest of agriculture proper, stock-raising, dairying, fish culture, and kindred industries varying

in importance from the Government Department of Agriculture at Washington to the ordinary County Fair, for the exhibition of farm products.

Agricultural education and mechanic arts in the United States have received liberal encouragement by grants of public lands from Congress. In 1862 an act was passed presenting to each state which would provide agricultural colleges, 3000 acres of the public domain for each senator and representative in Congress, to be applied exclusively to education. The states availed themselves of the opportunity, and about fifty colleges for industrial education, including a course in Agriculture were established. Their systems embraced agricultural chemistry, practical agriculture, landscape gardening, farm implements, animal husbandry, veterinary science, etc.

The last half of the last century witnessed more real advancement in agriculture than all the generations before. The findings of chemical, physical and biological science have been applied to the business of farming until it rests on a firm basis of known fact; and while much yet remains to be done and learned still sufficient has been accomplished to establish the belief that in a short time, agriculture will be conducted according to the principles of an exact science. The effect of all this has been first to make agriculture profitable, and has created a new object in the occupation. Formerly men farmed for maintenance, we farm for money.

Agriculture has become a skilled profession as well as a diversified industry, calling for high attainments in scientific and practical knowledge together with financial ability. A second effect of recent agricultural development is to make farming more difficult than formerly, and to exactly that degree, it has become unsuited to the ignorant and incompetent. It now challenges the best intellects and awards the finest training. The up-to-date agriculturist must have a system

that harmonizes with his surroundings: he must know his soil, climate, markets, and his crops; and the proper use of this knowledge enables him to manage his farm economically. This means then that there is a scientific and a business side to farming. A farmer may know much of science and yet, without the ability to apply it, his knowledge is of little value to him; on the other hand he may have little knowledge of science as taught, and yet be fairly successful, provided he has business ability, but "It is the men who do things and know why they do them that reach the top of the ladder."

Conditions are favorable just now for extreme advancement in Agriculture. There is great public interest in the matter; governments national and state are committed to the policy of public aid to this industry. The educational spirit of the times is in sympathy with industrial and practical training. Publications giving the results of agricultural research now outnumber those along any other line. The agricultural press is exerting an influence upon the public not thought of twenty-five years ago, and the great tribute to this fact is the movement establishing agricultural departments in our great daily newspapers.

The objects of all these improvements in agriculture is to raise more and better crops and live stock on American soils; to produce them more economically and to sell them to a better advantage in the markets of the world, in order to increase the profits in farming; and to preserve the fertility of our soils in order that production will never grow less, and that our descendants may have an existence. Last and greatest of all is to develop a large body of young men and young women capable of founding homes for the production of typical American citizens.

Of all the agencies working for agricultural advancement, outside

the scope of the farmers themselves, there are two that deserve and should have the support of farmers' organizations: these are the Agricultural College and Experiment Station. Both are working in new and difficult lines, both are necessary to progress and both absolutely depend upon the agricultural people for their existence.

Elementary Agriculture is now taught in a few country schools. It should be taught in all country schools and in the high schools, so as to give the boys and girls of the city some insight of agriculture, the greatest of all industries.

Agriculture at this time is becoming a well organized and scientific industry. Its change from an industry requiring only physical strength perhaps to one requiring skilled and trained intellects means that it has now acquired a dignity which it has never had before. And in bringing farming in America to this high standard, perhaps no force has been of more importance than the United States Department of Agriculture. In several important ways the Department is working for a remodeling of agriculture:

First, By finding out the secrets of the soil and the adaptation of certain crops to certain soils. The Department is sending out qualified men to analyze the soils in different localities of the United States in order to ascertain what crops are best adapted for those localities. By wiser rotation, better tillage, and more economical fertilization, the soil is yielding profits which the farmer of a century ago would not have thought possible.

Second, In seed selection and in the breeding of animals and plants, great advancement has been made, especially during the last few years. The scientists believe that within fifty years, the yield of our principal crops can be increased fifty per cent by seed selection alone. The Minnesota Experiment Station has done a great work

in breeding corn, wheat, and flax. Our College and Experiment Station are taking up the work extensively now.

Third, In introducing new crops especially adapted to certain sections, as macaroni wheat in the West, rice in Texas and Louisiana, cotton in Oklahoma, and oranges in California.

Fourth, Insect pests and diseases of plants and animals, which would have meant financial destruction to farmers of another age, are conquered by the most wonderful scientific remedies. Millions of dollars are saved every year by the work of the Bureau of Animal Industry and the Bureau of Entomology.

Fifth, The improvements of farm machinery, by which within fifty years the time required for human labor to produce a bushel of corn has been decreased from four hours and forty minutes to only forty-one minutes, and for the production of a bushel of wheat from three hours and thirty-one minutes to ten minutes.

The Department has done a great work by introducing practical methods of irrigation, in the arid regions of the West, which has changed thousands of acres of desert land to a productive fertile soil.

The educated farmer of today is careful to preserve his capital undiminished. He knows how to plow to conserve moisture and prevent washing; he knows what elements each crop draws from the soil, and how to rotate crops to prevent a constant drain on any one element of fertility. Nitrogen, the most costly of these elements, he has learned to draw from the air through leguminous crops, such as clover, alfalfa, soy beans and cowpeas. By feeding his grain to stock and applying the manure to the land, he provides the needed supplies of potash and phosphoric acid.

The World's Fair at St. Louis had a world-wide influence on agricultural education. One of its chief elements of greatness, was the

prominent position it accorded agriculture and live stock. Visitors pronounced the exhibits made in the Palaces of Agriculture and Horticulture to have been the most instructive of any fixed exhibits on the grounds. These agricultural exhibits were of materials so representative in character, and were so arranged as to constitute a great object lesson and an educational benefit to all.

By the continued advancement of learning in our Agricultural Colleges and Universities, they have equipped young men and young women with a training which has made the United States the leading Agricultural Nation in the world. And with the vast improvements being made in farm machinery and the numerous new investigations in scientific agriculture, we may expect still greater advancement by the close of the Twentieth Century.