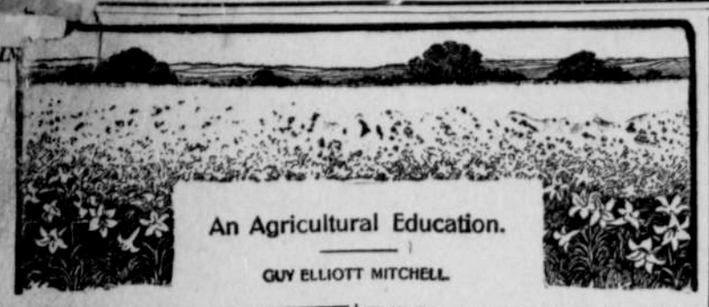


An Agricultural Education.

GUY ELLIOTT MITCHELL.

The following interesting account of the life work of Edgar J. Hollister is sketched by Mrs. Grannis, who has had the opportunity of personally observing some of the results of his wonderful activity. Except for Dean Hollister's retiring modesty regarding his own performances, Mrs. Grannis says that it would be possible to present many more stimulating incidents of difficulties overcome. All in all, his life work is doing much not only for American agriculture, per se; but for the advancement of the idea that brainwork-farming pays, and that there is as promising a field in this line of endeavor as in any of the mercantile or industrial occupations.

Through Toil to Triumph.

By Anna C. Grannis.

It is a far cry from a Canadian farmer boy in the sixties to the Dean of Agriculture to-day in a rising institution in the West, yet, by the application of science to practical farming, such a change has been wrought by Edgar J. Hollister, a soil expert of wide reputation.

No agricultural college opened its friendly doors to this young pioneer, nor was the Canadian government so deeply interested at that time as now, in its farming population. Books on the subject were few and fell woefully short of the mark, yet he knew neither discouragement nor dismay.

A call from western Ontario, his birth place, came in 1873 and in response, some time was spent in setting out peach orchards, the work losing its irksomeness because of the study which accompanied it. Moreover, at this point a company was engaged in reclaiming some twenty-five thousand acres of land by the drainage of an inland lake. The young man assisted in some of the surveys and was in touch with the chief engineer of the work. His enthusiasm was aroused by the anticipation of the results which would come from the addition of such a large acreage, which hitherto worthless, was now, by reducing it to cultivation, to be made productive.

Then some further years of study and preparation Mr. Hollister became interested in the organization of a company for the development of a large tract of swamp. The land was cleared of brush and reclaimed to cultivation, buildings erected, machinery installed and a system of farming, very nearly perfect, was established. Fields of six acres were made to produce an income of $3,000.00 each, while others of four acres produced $1,800.00. Of the latter $1,200.00 was net; while thirty-five acres was made to yield $14,000.00 gross at an expense of $8,000.00. Of course, these were special crops such as celery, onions and other vegetables

SLOW PROCESS OF NATURE.

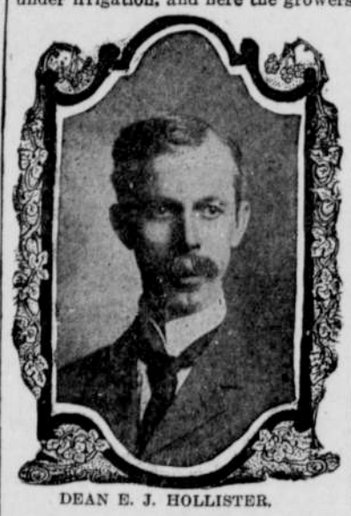
In some instances five years is the period allowed for the reclamation of land by the slow process of nature after the drainage has been obtained. Even then these lands may fail to produce paying crops, because of their deficiency in essential elements such as lime, potash, phosphoric acid and magnesia. These are some of the forces which go to make stability in plants. It is true that such lands contain a large percentage of nitrogen, accumulated from the decomposition of vegetable matter annually produced in low places. However, this nitrogen, which would produce growth were it available, is in an unknown quantity and available only when sufficient moisture is present, yet does not produce the same results upon crops as nitrogen derived from other sources, such as bone, dried blood or barnyard manure.

To make these lands productive immediately after drainage, it is necessary to correct their acid condition by the use of lime and by disintegration of the soil particles, thereby increasing their powers to retain water and absorb oxygen. These forces together, with act on potash and the three absolute essentials to plant growth are nitrogen, phosphoric acid, potash, and phosphoric acid and make them available as plant food.

Mr. Hollister visited Florida and secured a tract of land which for five years was used experimentally. Although he was in one case much handicapped by inadequate drainage, which it was not found practical to improve, the results were, however, very satisfactory.

In 1895, in Canada, the next field of operation, a phenominal success rewarded eighteen months. Here Mr. Hollister proceeded upon the theory that, climatic conditions being equal, certain crops are adapted to certain soils, and that planting those which will bring the greatest revenue will enhance the value of the land, inspire the people with enthusiasm and encourage development in all lines of trade. For example, Kalamazoo, Michigan, was once surrounded by bogs and flats worth scarcely $10.00 an acre. After the incoming of the Hollanders, who began raising celery on these supposedly worthless lands, $600,000.00 was brought annually to the town by the sale of this vegetable. In ten years' time the land increased in value to $900.00 an acre.

In 1899, a trip was made to Colorado where the people were farming under irrigation, and here the growers



DEAN E. J. HOLLISTER.

were taught the economical use of water and the method of creating a favorable environment for plants. A visit was made to Maryland, where experiments with soil and plant life added still further to the experimenter's fund of knowledge, but in 1901, the most difficult and seemingly impossible work was to come, i.e., the reclaiming of tidal lands on the north shore of Long Island Sound. The Department of Agriculture already had had a man in the field, who had reported the feasibility of reclamation but by slow processes, and that investigation revealed too many failures.

In spite of this, Mr. Hollister had sufficient knowledge, gained experimentally, to suggest success, added to which was the further information gained during a four years' residence in Washington, D. C., for the express purpose of consultation and co-operation with the experts of the Department of Agriculture. An experiment was first made on a small tract on the south side of Long Island, where the salt bog had simply been taken up and thrown inside of a dike, constructed of lumber sufficiently strong to withstand the tide. This bog was made smooth and even, and chemically treated in the month of August. By the first of October the surface was covered with a beautiful growth of tame grass six inches high. This might certainly be termed, "A Quick Process Route." Work on a sixty-acre tract on the north side was begun in June and completed in December of the same year. On this land, covered the previous autumn with salt water, nine hundred bushels of turnips were produced on two acres during the first season. Rye, oats, celery and vegetables throve on the same tract. The following year twenty acres were seeded to meadow land in April. By August it was covered by a beautiful turf, strong enough to hold up cattle pastured thereon. The remaining portion of the sixty acres produced luxuriant crops of vegetables and corn. A year later the meadow yielded four tons of hay to the acre and was considered a great demonstration of the productiveness of these lands under applied science.

MAKING SEA LAND PRODUCE.

Another equally successful experiment was conducted by this "Wizard of the Soil" on this same tract, viz., the transforming of a five-acre tract of sea sand to a loamy condition. The soil was first treated with chemical fertilizers and in the fall rye was sown, which covered the ground in winter and made a full growth the following spring. This crop was plowed under in June and followed by a crop of corn sown broadcast. The corn was plowed down in the fall and the sand lot planted in rye. It will be seen that in this process nature was being assisted by moisture and sunlight to change sand into rye and corn stalks. Then the sand, by the natural process of decomposition of these grains, brought about a complete change in the physical condition of the soil.

The work of this interesting man attracted the attention of many people pursuing scientific agriculture, among whom was H. J. Heinz, the pickle manufacturer—57 kinds—who is interested not only in the culture of the vegetable kingdom but in the intellectual growth of boys, and through his activity Mr. Hollister was elected Dean of Agriculture at the Agricultural Institute of Winona Lake, Indiana. Here he was seen last summer, handling his crops of embryo farmers who seemed imbued with his enthusiasm and whose first harvest received encomiums from five thousand visiting farmers, who unanimously adopted resolutions endorsing the work.

EDUCATING FOR SMALL ARMS.

A plan is now taking tangible form, which will lead to the establishment of small farms comprising five to twenty acres each. On these farms young men will be taught combined scientific and practical agriculture. They will also demonstrate the possibility of getting an income and genuine happiness from their investments which may well be envied by the salaried man or the man of moderate capital in the city. It is believed too, that this work will have a wholesome effect upon the farmers throughout the country. An increase of even $100.00 in the revenue of each farmer when multiplied by five million, would establish the prosperity of the American Nation, the bulwarks of which are its farming population.

Mr. Hollister is also directing a work of reclamation of a large tract of salt meadow on the Connecticut coast which, when reclaimed, will be used for the purpose of intensive farming, thereby firmly establishing the fact that these lands may be used to furnish employment and bring wealth and happiness to the people.

Thus each day reveals some new progress, and farming, that once seemed a hopeless, hapless drudgery, is being shown a golden highway to an ever increasing success.

Value of Alfalfa to Farm Animals.

The Bureau of Animal Industry of the Department of Agriculture has recently published a study by I. D. Graham of the use of alfalfa for the growing and fattening of animals in the Great Plains region. The results attained by experiments, while of inestimable value to live stock growers in the region mentioned, may well be considered by stockmen in other sections.

Some of the questions considered in the experiments were the composition and digestibility of alfalfa, the calculated cost of nutrients supplied by alfalfa and other feeding stuffs, the value of alfalfa hay cut at different periods of growth, alfalfa as a pasturage, soiling, and hay crop, alfalfa meal, and the value of alfalfa, fresh and cured, for different kinds of farm animals and for poultry. The importance of this crop as a honey-producing plant was also considered.

Finely ground, kiln-dried alfalfa hay, called alfalfa meal, has given satisfactory results as feeding stuff. The commercial article is made from selected alfalfa and mixed with sugar-beet molasses in the proportion of 75 per cent. alfalfa and 25 per cent. molasses.

Horses and mules, it is stated, thrive on alfalfa pasture, and while alfalfa is too rich a food for mature horses unless used in combination with some other roughness, it is an excellent feed for young ones, as it seems to contain just the elements necessary to develop bone, muscle, and consequent size. Caution should be used, however, in feeding alfalfa to horses, particularly if they have not been accustomed to it. Like other concentrated feeds, it seems to stimulate all the physical processes to such an extent that various disorders of the digestive system may appear. This is particularly noticeable in the urinary and perspiratory glands.

When alfalfa is fed to horses in considerable quantity the grain ration must be proportionately reduced and an abundance of other roughness furnished. When horses have attained a mature age and it is desirable to change from other hay to alfalfa, this change must be very gradual, and the alfalfa selected for this purpose should be more advanced in growth at the time of cutting than that which is to be fed to cattle or sheep. As a general statement, very ripe alfalfa hay is the best to use for working and driving horses, while that prepared in the usual way—that is, cut when the field is about one-tenth in bloom—is better for the colts. In any event, horses that are fed alfalfa hay must be given abundant exercise.

For dairy and beef cattle and for sheep, alfalfa has given very good results. As regards the use of alfalfa hay for pigs, it is considered better to cut it early, so that a larger proportion of leaves may be saved and consequently a larger proportion of protein conserved. While late cutting, after the leaves have fallen somewhat and the stem hardened, is better for horses; for pigs, especially growing pigs, the crop should be so harvested as to save the largest number of leaves. Experience teaches also that the third or fourth crop is better for pigs because it is softer and more palatable. It is always wise to provide some sort of a trough or rack with a floor in it for feeding alfalfa to hogs.

Alfalfa in its green state, or when used as hay or ensilage, is a first-class poultry food. Poultry will pasture on it during the summer and thrive. It is best for poultry to use the last cutting of alfalfa, as it is softer in texture, has a larger proportion of leaves, less woody matter, and is more succulent than any other cutting. While poultry of all classes will eat alfalfa hay, or at least the leaves from it, and thrive, it is undoubtedly a better practice to chop or grind it and mix it with a grain ration. A good practice is to steep the alfalfa hay in hot water and let it stand for several hours before feeding.

The Irish Potato.

A rich, sandy loam is best suited to the production of Irish potatoes, and the fertilizers employed should contain high percentage of potash. The main crop of Irish potatoes for family use should be grown elsewhere, but a small area of early ones properly belongs in the garden. The preparation of the soil should be the same as for general garden crops.

In a recent bulletin on farm vegetables, the department of Agriculture recommends that for late potatoes, the rows should be 2½ to 3 feet apart, and the hills 14 to 18 inches apart in the rows. Lay off the rows with a one-horse plow or lister, and drop the seed, one or two pieces in a place, in the bottom of the furrow. Cover the seed to a depth of about 4 inches, using a hoe or a one-horse plow for the purpose. One to three weeks will be required for the potatoes to come up, depending entirely upon the temperature of the soil. The ground may even freeze slightly after the planting has been done, but so long as the frost does not reach the seed potatoes no harm will result, and growth will begin as soon as the soil becomes sufficiently warm.

As soon as the plants appear above the ground and the rows can be followed, the surface soil should be well stirred by means of one of the harrow-toothed cultivators. Good cultivation should be maintained throughout the growing season, with occasional hand hoeing, if necessary, to keep the ground free from weeds. Much depends upon cultivation. Toward the last the soil may be worked up around the plants to hold them erect and protect the tubers from the sun after the vines begin to die. When the tubers are fully ripe the vines will be quite dead, but digging should not be delayed too long, as the potatoes will make a second growth in case wet weather should set in, and weeds will start seriously interfering with harvesting the crop. On a small scale, dig with a spading fork, and on a large scale, use either one of the special digging machines or a turning plow, which latter will cover up a good many potatoes. A late crop may be planted during May or early in June in the North, and harvested late in autumn, when the frost has killed the vines.

After digging the potatoes, they should never be allowed to lie exposed to the sun, or to any light while in storage, as they soon become green and unfit for table use. Early potatoes especially should not be stored in a damp place during the heated part of the summer, keeping best if covered over in a cool, shady shed until the autumn weather sets in, after which they can be placed in a dry cellar or buried in the open ground. The ideal temperature for keeping Irish potatoes would be between 36° and 40° F., but they will not withstand any freezing.

A thousand bushels of potatoes have been raised on one acre. How many farmers, who chance to read this, have raised 200 bushels on an equal plot? And there are some who can not grow 100 bushels on their acre.

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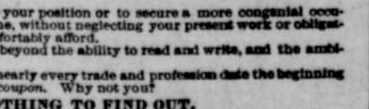

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