WORK OF ENGLAND'S "RURAL EDISON"

How He is Improving the Products of Food Plants

IN England they call him the "Rural Edison" because his wizard touch has called into being new forms of plant life of as practical benefit in their way as electricity; in America he will suggest to the average person another wizard whose triumphs have been in the domain of the plant kingdom—Luther Burbank. But he's just plain John Garton, merchant, farmer and amateur scientist, and he has taken up the task of revolutionizing Great Britain's plant life as a side diversion.

That old legend about applying the multiplication table to a blade of grass in a small way is too archaic to fit this man, for he has made six rows of grain grow on a head of barley where but two grew before!

Anything else? Well, he has created a few new plants—made blades spring up which had never existed before.

He has increased the produce of fields over 50 per cent. He asserts that plants are not fertilized by the wind or insects, but fertilize themselves. He has taken a good-for-nothing miser of a wheat plant from Asia, set him to work in England, and made of him a right useful citizen.

He has shriven the barley of its beard; has produced an oatmeal which gives you meal of oats for breakfast, not meal of oats and oat husks.

These are just a few samples of what he has done.

WITHOUT in the least intending to hurt any one's feelings, or to "run in with" the learned professors, this English farmer, John Garton, has found it expedient—necessary, indeed—to overturn to a considerable extent the existing science of botany. But, then, it isn't his fault if the books are wrong.

It is with reference to the manner in which grain plants reproduce themselves that he has seen fit to upset the old teachings.

How are plants propagated? Turn to one of the old botanies. There you have it. The plant must be in bloom, approximately in full growth, when the fertilization takes place, and there must be interference either of wind or insects to carry the pollen from one part of the bloom to the other. That's what it says.

Now hear this British farmer dispose of that theory with one word: "Inaccurate."

For one thing, he declared it inaccurate because, he says, he has found that the fertilizing process does not take place at the period mentioned at all, but at an earlier one; and, in the second place, because the plants are not fertilized by one another.

That each bloom fertilizes itself without the assistance of airs or insects is certainly a radical, a remarkable, statement. How does Mr. Garton know it?

Well, in the use of a microscope with a camera at the end of it he is as adept as any man in England, and it was the photographic evidence thus secured that convinced many leading professors and savants that he was right.

For he showed by the camera the process of segmentation going on before the plants had reached full bloom, and that this was done when there was no possible manner of transferring pollen from another source.

There is a difference which is by no means sentimental—which effects the food production of the world as perhaps nothing else.

THE STARTING POINT

Take as a starting point the fact that corn is the staple from which the world is drawing the bulk of its food. Now, on the face of it, it might seem inconsequential whether corn is fertilized from an outside source, or by itself. But it is of moment.

Knowing that corn is susceptible of "in-breeding," one can easily see the possibilities that lie in cultivating a better grade of corn, in keeping the stock up to the highest standard.

But, before going further into his work, who is this man Garton, anyway?

He and his brothers are grain merchants in Cheshire, England, and his experimental work has been carried on as a side diversion. As fast as he learned anything of value, he gave it gratis to the farmers.

But he found that farmers did not appreciate that which they got for nothing, and so hit upon a system for spreading his knowledge which brought better results.

He decided to go into the business of seed selling. The object of the firm, as he announced it, was not solely to make money, but to improve the standard of corn-growing.

Said Mr. Garton: "The experiments had become a Frankenstein; they grew to be so powerful over me that I had to stop them or be stopped by them. I elected to make money to continue them."

So his firm has become a money maker, and he is spending a great portion of his share of the profits on his experiments.

Deciding that if cross-fertilization is to be carried out it must be done at an earlier stage than the time when the spikelets open, he took to preventing self-fertilization at the logical time—this by removing the parts which make self-fertilization possible—and then it was no difficult matter to apply to the plants the propagating parts of other plants.

It wasn't enough to make photographs—enlarged 1000 times—showing the course of embryonic development of a self-fertilized plant; Mr. Garton went further and showed by the camera that wind and insects cannot and never do effect re-fertilization or destroy the effects of the first fertilization after it has taken place.

Now, another instance in which this man has overturned the accepted authority of the whole world. He has proved that many weeds, instead of being pests, are blessings!

Impossible? No. See what the "Rural Edison" has done.

He started out with the fact that certain weeds are so well fitted by nature to maintain life that they thwart the most ingenious devices of men, the elements and animals in getting rid of them.

Very well. Let them impart to some of the useful food plants this attribute. Then the food plants will crowd the noxious weeds out of the soil, or convert them to the ranks of the food plants. This was done by cross-fertilization.

That is, cross the food oat with a wild oat, or weed, and you have the original food value combined with the hardihood of the wild oat. To be sure, the grain may be smaller, but by selection of seed it may soon be brought to satisfactory size.

By bringing into being a new wheat, one of whose parents is the wild wheat of Southern Asia, lacking commercial value, and the other the ordinary English wheat, Mr. Garton has given the farmer a wheat that is hardy, ripens early, has great food strength and does not shed its seed until the opportune time.

And so it comes about that in those hot countries such as India, Australia and Argentina, wheat production is increasing because of the experiments of this wonderful man at Acton Grange, England. Even in North America—in the northwest provinces of British Columbia—the results of his discoveries are aiding farmers to get larger and better crops.

Mr. Garton combined a Chinese oat with a British cultivated oat, and there has appeared a new breed of oats which produces ten to twenty grains in each of the spikelets in its ear instead of the two or three which farmers had found in the old varieties, and these grains all appear without a husk.

What difference does the husk make? Just this, that now when an Englishman buys oatmeal he gets the meal from pure oats, and does not have to consume, in addition, the husks ground up with the oats.

Again, he has re-crossed the improved varieties until he has secured varieties infinitely superior to any of the originals.

For instance, he took the ordinary commercial oat, with its objectionable fibrous husk and hairy inner kernel; the Garton oat, huskless, hairless, prolific; then the English wild oat to impart hardiness, and finally secured the triumphant Garton oat itself with its inherited hardiness, loose cuticle, hairless kernel and prolific character.

Take barley. First, Mr. Garton started with the original type on the head of which are two rows of grain. Up between them one notices two rows of chaffy scales. What would this suggest to the ordinary observer? Nothing. To Garton it brought this brilliant thought:

"The barley really wants to have six rows of grain instead of two, and these scales are florets which it has been unable to fertilize."

Poetic? Yes, but Garton proved it practical as well. Well, he has taken young barley plants at the proper period and has fertilized those parts for them, by injecting pollen from opposite sources, and has actually caused them to produce six grains of barley where two grew before.

Of course, this will not be of general benefit until the seed from those new plants shall be cultivated year after year and a considerable stock secured.

There's a bewhiskered barley over in England which is of very little food value. There's another kind—the Nepaul barley—which has no such beard.

By combining the two, Mr. Garton has secured the whiskerless barley, which England has hailed as a great boon.

In other cereals he has secured just as notable results.

Three thousand or more farmers every year visit Acton Grange to see the results of Garton's twenty-five years of labor, and are astounded and helped.

From figures gleaned from those farmers who have been using his seeds is developed a net average increased yield for six years of over 53 per cent. in favor of the new breeds of oats, and 60 per cent. in the new breeds of corn.

And here is what Mr. Garton says of the past and the future:

"Twenty-five years ago seems five to me, the work is so interesting. It gets my life over, and I enjoy it.

"With me life does not hang. Twenty-four hours are not long enough. A week is soon over. If I have the pleasure of watching the results of thirty or forty harvests this is all I see life is given for.

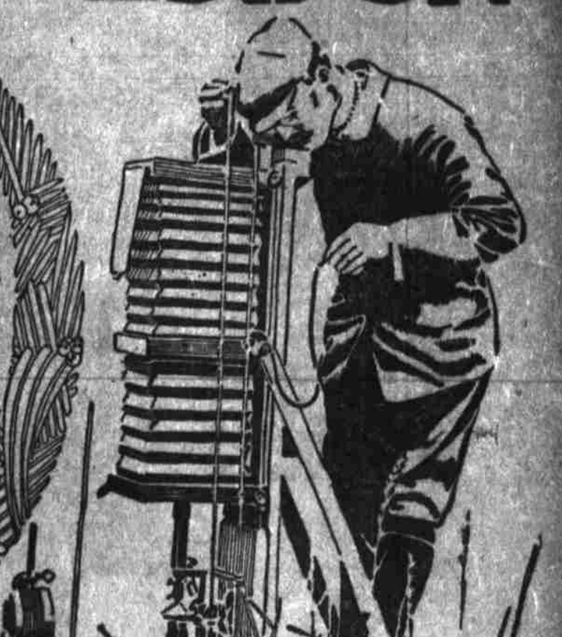
"It has taken fourteen years to produce progeny from species. I am as full or fuller of interest in my work than ever.

"The work I have done during the last twelve months will not be of any national utility for fifteen or twenty years. After success has been attained on a small scale the field crops for sale as seed have to be produced.

"But what I did twenty and fifteen years ago is making its impression. It is the start. It is difficult to speak of eventual possibilities.

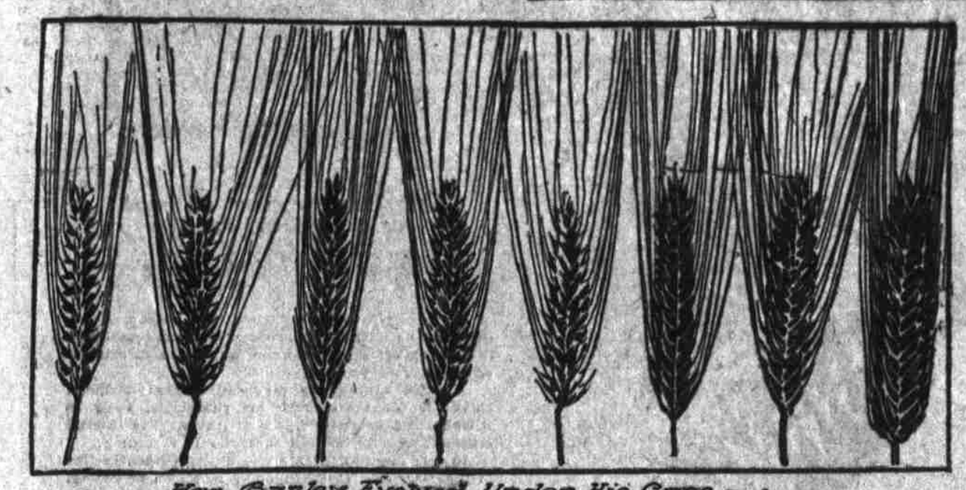
"It would seem that there is practically no finality to the evolutionary changes and developments which the continuation of the work which I have begun might bring about in the food-producing plants of the world."

John Garton, Food Plant Experimenter



Mr. Garton Studying a Growing Plant

Harvests of First and Second Years in an Experimental Field



How Barley Evolved Under His Care

Head of Common Wheat Made to Enlarge

American Heroes Favorites

AN INDICATION of what the Japanese in their own country think of the United States was given by the result of a straw vote taken among the children of the Iriye primary school, in Tokio, not along ago. Dr. Yamakawa, formerly president of the Tokio University, asked the 348 boys to write down the names of their favorite hero.

George Washington and Abraham Lincoln came at the head of the list, with 69 and 53 votes, respectively. Admiral Togo came third, with 28 votes, and Nimomiya Sontoku, a famous Japanese philanthropist, came next.

Then followed Benjamin Franklin, Florence Nightingale, four Japanese, Admiral Nelson, six Japanese, then Bismarck, two Japanese and Napoleon.

Among the scattered numbers were President Roosevelt, Galileo, Columbus, Socrates, Peter the Great and Admiral Makharoff, of Russia. The names of the latter two seem to show the Japanese are not actuated by bitter national feelings.

Japan's Phenomenal Progress

SINCE her war with Russia, Japan's progress has been phenomenal. The merchant tonnage, since the end of the hostilities, has increased from 100,000 to 1,000,000. And what has marked the astuteness of the government officials has been their alertness in forming a great trust "of and by the people," rather than allowing small ones. The government has gained control of the camphor, salt and tobacco industries, besides inaugurating a movement nationalizing the railways of the country.

To purchase private railways, the government has floated a bond issue of 30,000,000 yen, or $15,000,000. It bought and paid for the Seoul-Chemulpo Railway in Corea, paying $19.65 for each $15 paid-up share. The capital of the Tokio Railway is to be increased $20,000,000 for improvements and extensions.

The output of copper of Japan increased from 23,200 tons in 1899 to 36,600 tons in 1905. Although one of the largest copper-producing countries of the East, the industry is yet in its infancy, and the operations are conducted in a happy-go-luck manner. The home consumption of copper is 7000 tons a year.

In Corea, Japanese enterprise has manifested itself in the application for 175 charters to work coal mines. In Hokkaido, a new coal field was discovered recently, the vein covering an area of 1897 acres.

On September 29, 1906, the Bank of Japan, which conducts the government banking business, reported cash on hand of $74,000,000, an increase of $21,000,000 over the preceding year. The note issue was $129,000,000, against which the government bond debt to the bank was $48,000,000. The amount at credit of the government's current account was $228,000,000, an increase in the year of $51,000,000. There was an increase of $7,000,000 in private deposits. Advances on stocks were $243,000,000, an increase of $57,000,000. The capital of the bank is $15,000,000.

For the nine months ending September, 1906, Japan's foreign commerce amounted to $305,000,000. This was a decrease of $3,500,000 from the corresponding period of 1905. Exports amounted to $143,000,000, an increase of $31,000,000; imports were $162,000,000, a decrease of $34,500,000.

To take advantage of the increase of merchant tonnage leading merchants and capitalists recently established a marine insurance company, with a cash capital of $2,500,000, to be increased to $5,000,000.

Curious Facts From All Over the World

SIBERIA, says an English geographer, contains one-ninth of all the land on the globe. Great Britain and all Europe, except Russia, together with the whole of the United States, could be put into Siberia.

Oreg, in Sweden, has, in the course of a generation, sold $5,550,000 worth of trees, and by means of judicious replanting has provided for a similar income every thirty or forty years. In consequence of the development of this commercial wealth there are no taxes. Railways and telephones are free, and so are the schoolhouses, teaching, and many other things.

In Persia the man who laughs is considered effeminate, but free license is given to female merriment.

In Madagascar every one wears silk, as it is cheaper there than linen.

Reindeer hair is much used in Norway for filling in lifebelts. Its buoyancy is said to be greater than that of the best cork.

Most persons employed in the Venetian glass industry begin to lose their sight when they are between 40 and 50 years of age, and in a short time become blind. This blindness is caused by the excessive heat and glare from the furnaces.

The river Jordan makes the greatest descent in the shortest distance of any stream. During its course of 130 miles it has twenty-seven falls and descends 3000 feet.

When the moon is full, in some parts of Africa objects are distinctly visible at a distance of seven miles; while print can be read with ease by starlight.

Ostriches have the greatest contempt for Kaffirs and Hottentots, and attack them much more readily than they do white men.

Every gem known to the lapidary has been found in the United States.

The Great Barrier Reef, fronting the coast of North Australia, is the largest coral reef in the world. It is over 1000 miles long, and thirty miles wide.

Many of the women of Poland are remarkable for their beauty and grace of form. As a rule, the Polish girl has exquisite taste in dress, and knows how to blend colors artistically.

In 1875 the number of cigarettes smoked per head of the population in Austria was two. In 1905 it was 140.

There are few able-bodied paupers in Holland. A tract of public land, containing 5000 acres, is divided into six model farms, to one of which the person applying for public relief is sent. Here he is taught agriculture, and is subsequently permitted to rent a small holding for himself. Holland also has a forced-labor colony, to which vagrants are sent to do farm and other work, whether they like it or not.

ANCIENT SACRED FIRES

The sacred fires of India have not all been extinguished. The most ancient which still exists was consecrated twelve centuries ago in commemoration of the voyage made by the Parsees when they emigrated from Persia to India. The fire is fed five times every two hours with sandalwood and other fragrant materials, combined with very dry fuel.

Visitors to Japan are usually impressed with the many curious uses to which fans are put. The umpire at wrestling and fencing matches uses a large fan, the various motions of which constitute a language that the combatants understand and promptly heed. Men and children, as well as women, use fans at all times. The servant has a flat fan, made of rough paper, to blow the charcoal fires with, or use as a dust-pan. The farmer has a stout fan to winnow his grain. Still another variety is made of waterproof paper, which, dipped in water, creates a pleasant coolness by evaporation without wetting the clothes.

The best eyesight is possessed by those people whose lands are vast and barren, and where obstacles tending to shorten the sight are few. Esquimaux will detect a white fox in the snow at a great distance away, while the Arabs of the deserts of Africa have such extreme powers of vision that on the vast plains of the desert they will pick out objects invisible to the ordinary eye at ranges from one to ten miles distant. Among civilized people the Norwegians have better eyesight than most, if not all, others, as they more generally fulfil the necessary conditions.

Gaspipes of paper are being made in France. Manila paper is cut in strips equal to the length of the pipes to be made. These are then placed in a receiver filled with melted asphalt and wrapped around a core of iron until the desired thickness is reached. After being submitted to strong pressure, the paper is coated with sand, cooled, the core withdrawn and the outer pipe surface covered with a waterproof preparation. It is said that these pipes are as good as and more economical than metal ones.

Nothing can be more delightful than a trip through Iceland. The traveler sees thousands of mountains covered with eternal snow, outrivaling the Alps in grandeur; great geysers and innumerable hot wells; waterfalls, one of which—the Gullfoss—is second only to Niagara in size and beauty; crystal streams and dashing rivers; lava beds of fantastic figures, covered with moss that glistens in the sun like hoar frost, and, as a crowning glory, the atmosphere is so brilliant that objects over fifty miles distant appear close at hand.

A lake of quicksilver, covering an area of more than three acres and having a depth varying from ten feet to fifty feet, has been discovered in the mountains of the State of Vera Cruz, Mexico. The value of the product is estimated at millions. This lake has been known to the Indians for many generations. It is situated far in the mountains in an almost inaccessible position. Its surface is partly covered by stones. It is believed that volcanic action in the mountains above smelted the quicksilver out of the cinnabar ore and that it ran down and filled this depression. A tunnel will be driven through the base of the mountain, and the quicksilver will be brought down by means of gravity.

Uncle Sam's New Ward—the Maltese Goat

SOME TIME this year Uncle Sam will probably decide whether, in his opinion, his new animal wards from Europe—Maltese goats—possess the many good qualities that have been ascribed to them.

In the latter part of 1905 the Agricultural Department imported sixty-eight goats from Malta to ascertain whether they would thrive on this side the Atlantic. This year's crop of kids will be a full generation removed from European life and influences, so that the real value of the animals may be determined.

The Maltese accredit the milk of their goats with peculiar curative properties in cases of gastric troubles, tuberculosis, diabetes, typhoid fever and some of the ailments of children.

NOT of much value, as a rule, is the common American goat for milking purposes. It has not been bred with that object in view.

In Europe, however, scientific goat breeders have been trying to fix this trait for years, just as cattle raisers in this country have been developing especial strains for dairy purposes.

For many years the goat of Malta has been regarded as one of the best milk producers, and as valuable in other ways.

The animals have made this reputation for themselves in the face of natural disadvantages, for pasturage in the islands is scant and goats have to find nutriment in places where an ordinary cow would nearly starve.

Twice a day the goats are driven out into the fields to graze. The herds range from six to thirty animals, and each herd is in charge of an attendant.

There are few cows on the islands, and the Maltese population of something over 200,000 must depend upon the goat almost entirely for milk.

Many owners supplement the scanty sustenance of the fields with a daily ration of carob beans and mixed cotton seed and bran, the extra feed costing about 7 cents a day for each animal.

Visitors to Malta may nearly always see herds of goats being driven through the streets. The milkman is on his rounds; instead of milking the animals at a dairy establishment and delivering the product in wagons, he drives the goats from door to door, stopping to milk them as a customer is found.

Because of this custom the housekeepers of Malta do not lay in their day's supplies in the morning, but buy several times a day, as occasion requires.

Two or three times a day goat herds may be seen wandering about the streets in charge of their keepers. The milk is sold at from 8 to 10 cents a quart.

The small quantity of cow's milk sold in Malta brings about the same price, and is purchased mostly by the English residents. Because of the scanty pasturage, the milk of cows is of an inferior quality.

Cheese and butter makers of Malta do not use the milk of goats. For both purposes they supplement the small quantity of cow's milk with that of sheep, but the sheep, too, are limited in number.

For that reason butter and cheese making is not a flourishing industry in Malta.

The importance of the goat to the Maltese can be appreciated. The best care is taken of the herds; in fact, there are stringent laws requiring cleanliness and attention to the welfare of the animals.

Maltese goats are of two varieties, the long-haired and the short-haired. They are usually brown or white, being about equally divided.

Most owners dehorn the animals at an early age. The average goat weighs nearly 100 pounds, and is about two and a half feet high.