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THOS. J. ADAMS PROPRIETOR.

EDGEFIELD, S. C., WEDNESDAY, APRIL 11, 1900.

HOW PLANTS ARE BRED.

HYBRIDIZATION PROCESS NEITHER DIFFICULT NOR MYSTERIOUS.

Professor Galloway Describes Experiments by the Agricultural Department at Washington—Seeking a More Nutritious Corn—New Forms of Fruit.

THE breeding of animals is well understood and has been practiced for years, but you cannot say as much of the breeding of plants," said Professor B. T. Galloway, chief of the vegetable physiology division of the Agricultural Department at Washington. "It is true, nevertheless, that the breeding of plants has been carried on with most satisfactory results, mostly by private parties, but with little attempt to determine the principles involved. The possibilities in the breeding of plants are just as great as in the breeding of animals. We find all through nature a constant effort on the part of the plant to improve. There is a constant progressive tendency in all organisms, animal as well as vegetable, and in the question of breeding man only takes advantage of his own interest. The fact is that most of the improved forms of plants we have to-day are derived in a more or less spontaneous way, and have been propagated by people who have discovered them and have taken advantage of the improvements. Nature has been made to do the work unassisted. As I say, most of our cultivated fruits and plants at the present time were developed by nature, and are therefore to be put down as accidents.

"Emphasis should be placed upon the fact that plants are not fixed entities," continued Professor Galloway. "I am aware that this is the general impression, but plants are exceedingly plastic and can be made to do almost anything. Looking at plants from that standpoint the wide field and possibilities in developing new forms will be seen. The process of hybridizing plants, as this is called, is neither difficult nor mysterious, it being simply necessary to understand the general structure of the flower to be used. Flowers have sexual organs, the stamen and pistil, the former bearing the male, are usually several in number. The very numerous small, yellow, powdery grains of pollen, which constitute the male fecundating elements, are born in sacks, and when the portion of the flower which bears them, known as the anther, matures it bursts and the pollen is exposed. A quantity of this pollen must be transferred either by natural or artificial means to the stigma of the female organ in order to insure fecundation. The pistils, which are the female organs, occupy the center of the flower and are surrounded by the stamens. The upper portion of the pistil is usually somewhat swollen and more or less rough. It is on this portion of the pistil, known as the stigma, that the pollen must fall to produce fecundation. In the majority of cases the stamens and pistils are produced in the same flower, as in the orange, tomato and our common fruit trees, but in certain plants they are produced in different flowers on the same plant, and in others on different plants.

"The most important feature in the work of crossing is to exclude from the stigma all pollen except that which it is desired to use. In the manipulation of orange flowers male buds nearly ready to open are selected, and the tips carefully pruned apart until the stamens are exposed. The pollen is then transferred to the pistil of the flower selected, and a small paper sack or gauze bag placed around it to prevent foreign pollen entering. The hybridizing process can be carried as far as the experimenter pleases. It consists of taking the pollen from the stamen and transferring it to the pistil. Where the two organs are found in the same flower it is necessary to destroy the stamen before it matures to assure that pollen from it does not interfere with the experiment. We have also carried on extensive experiments with pineapples, and have succeeded in getting crosses with certain important varieties in order to develop forms for which there is a demand. It is possible to produce plants and fruits to meet any demand. We are now working to develop a pineapple that has qualities different from anything we now have.

"These experiments I have referred to have been on the seacoasts of the country. Aside from these we are carrying on extensive experiments in the interior in the crossing of wheat, corn and other cereals. This year we did extensive work in Nebraska with corn. We have been trying to develop varieties that will have greater food value than those now in vogue, and the food which the new varieties contain is in different proportions from that which we now possess. There has been considerable talk of the possibility and desirability of increasing the nitrogenous contents of corn. That is one of the things wanted. The nitrogenous contents of corn are low compared with other cereals. If it can be increased, even by a small percentage, it will make its food value much greater.

"The experiment is being conducted something in this way: We find that there is a marked variation in the nitrogenous contents but in the different varieties but in the different parts of the same variety, on the same stalk but in different ears. The nitrogen could be increased by crossing two varieties having other characteristics and value with high nitrogenous contents, and by selection of the ears and grains obtain a variety with higher percentage of nitrogen. By selection and by crossing corn known to possess high nitrogenous contents forms can be developed that will, if the experiment is carried far enough, result in materially increasing the value of corn.

shes the pollen and the silk of the ears in the female organ. This silk is hollow, and the pollen, falling by nature upon it or placed there in crossing experiments, enters the silk tubes at the exposed end and proceeds through to the cob, where fecundation produces the grain. When crossing experiments are being conducted the tassels are cut from the stalk where the new corn is desired and scattered upon the silk. It is customary, however, to protect the ear, for otherwise pollen may be brought by the wind from adjoining rows of corn or even from a distance and interfere with the plan. We have just begun the corn experiments, and hope by breeding more varieties, among other things, to extend the northern corn belt by producing hardier varieties.

"With wheat we have worked longer, but in much the same way, our object being not only to increase our variety, but to produce a hardy species that will resist diseases and certain climatic conditions. We have worked to accomplish certain objects. For instance, foreigners are beginning to realize that our wheat is valuable for macaroni, and our own millers and bakers have discovered that wheat grown in certain sections is valuable for crackers. It is possible by studying the peculiarities of different wheat to determine that which is best suited for different purposes, and so we are proceeding by cross breeding to improve them.

"The possibilities of plant breeding," continued Professor Galloway, "seem limitless. The extent to which improvements can be carried is boundless. Heretofore, as I have stated, most of the work has been conducted by individuals without any purpose of establishing principles. When plant breeding is better understood it will be possible to bring definite forms of vegetable life together and produce any result desired. A strange but truthful story is related by Professor J. H. Bailey, of Cornell, of a seed man in New York advertising in his prospectus that he would furnish his customers during the next season a bean new bean with a peculiar kind of pod. This nurseryman had in his own mind decided what he wanted. He had never been produced before. He called to his assistant, an expert in plant breeding, and by drawing explained the kind of bean he desired. It was like a man calling a contractor, displaying his plans and specifications and instructing him to proceed and erect a house. Yes, the nurseryman had his bean, just what he wanted, and furnished his customers as he promised.

"If some of our plant breeders had lived on Rouben Bairs' farm, as we would have been burned at the stake. There is a man in California who makes it a business to produce new forms of plants and fruits. He decides what he wants, breeds to produce the results desired, and when he obtains something possessing qualities that will recommend it he disposes of a seedling to some nurseryman and then resumes his work for new results. The nurseryman having the seedling possesses a monopoly of that particular variety and is permitted by the California experimenter to dispose of it as he pleases."

On a wager that he could put a collar on an ungovernable horse, a traveling man deliberately killed the animal in Main street, St. Paul, Minn., the other day, and then adjusted the collar. He was arrested.

Glass bricks are gradually coming into use. Glass will soon be used for making statues for public places. It resists the corroding effect of the weather much better than marble or granite.

The Russian photographers have a strange way of punishing those who, having received their photographs, do not pay their bills. They hang the pictures of the delinquents outside down at the entrance to their studios.

Several weeks ago a calf was born on Rouben Bairs' farm, in Thornecroft Township, Ind., and instead of the regulation hair the quadruped was enveloped in a fine coat of black wool. The calf is a fine one and is growing rapidly, and so is the wool on it. When it baas it is difficult to tell whether the sound resembles that of a lamb or a calf.

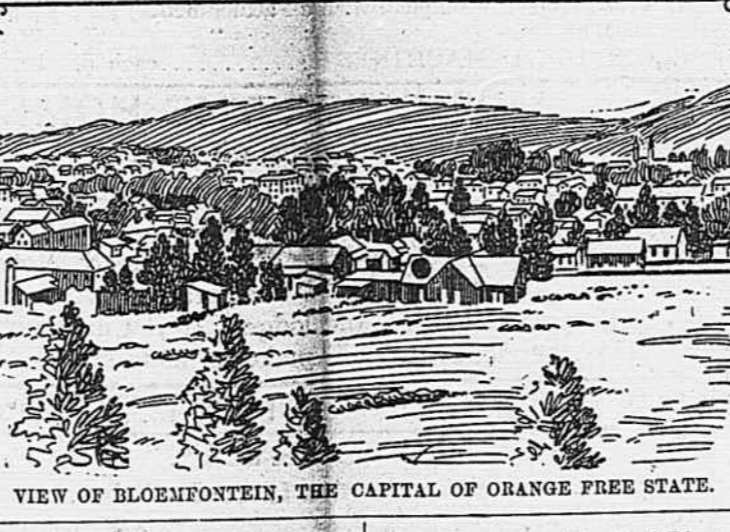
The smallest inhabited island in the world is that on which the Eddystone lighthouse stands. At low water it is thirty feet in diameter; at high water the lighthouse, whose diameter at the base is 28 1/2 feet, completely covers it. It is inhabited by three persons. It lies nine miles off the Cornish coast and fourteen miles southwest of Plymouth Breakwater.

A very curious case is recorded in the surgical history of the Civil War, in which three officers were hit just at the same time. One had his leg from the knee down carried away, but he rode ten miles to the hospital. Another lost his little finger, and he became a raving maniac. While a third was shot through the body, and though he did not shed a drop of blood externally, dropped dead from the shock.

There is an old church in Wakegan, Wis. which has no steeple, because of a court mandate forbidding such a construction. In 1862 a severe storm swept over the town, hurling the original spire against the house next door and wrecking it. The owner of the house got an injunction restraining the trustees of the church from building another spire, and this order has held for thirty-eight years.

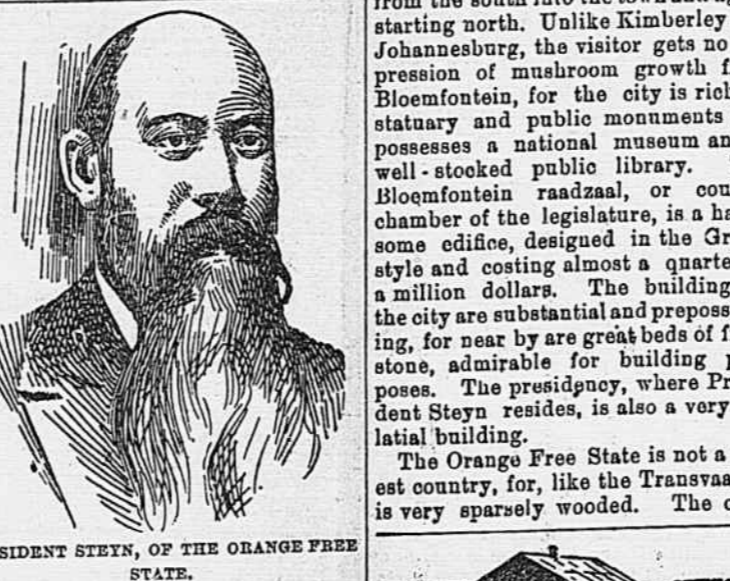
SCENES IN BLOEMFONTEIN, CAPITAL OF ORANGE FREE STATE.

THE Orange Free State had no quarrel with Great Britain. She was a free and independent State, living her own life and worshipping her own legislative and administrative gods. Her people, however, spoke the same tongue as the Transvaal. A shadow of the Anglophobia that lurked on the north of the Vaal was also to be found there. Several people saw the boy start, but no one was near enough to catch the track just in time to see the locomotive, with his boy on board, disappear around a curve. The father was wild with grief and fear, and the boy's mother was almost prostrate.



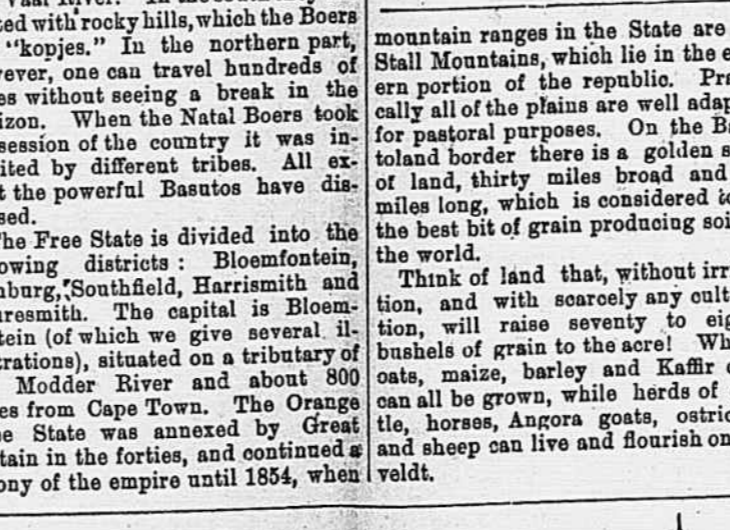
VIEW OF BLOEMFONTEIN, THE CAPITAL OF ORANGE FREE STATE.

like those north of the Vaal River, are simple, bucolic and sincere. An influx of Huguenot blood makes them a slightly more active and progressive people than the Transvaalers. The republic has an area of about 50,000 square miles. Its present population is estimated to be 93,000 whites and some 140,000 blacks of the Basuto and Barolong tribes. The capital, Bloemfontein, is a curious, old world looking little city, with a railway leading to the south into the town and again starting north. Unlike Kimberley and Johannesburg, the visitor gets no impression of mushroom growth in Bloemfontein, for the city is rich in stately and national museums and possesses a public library. The Bloemfontein raadzaal, or council chamber of the legislature, is a handsome edifice, designed in the Greek style and costing almost a quarter of a million dollars. The buildings in the city are substantial and prepossessing, for near by are great beds of freestone, admirable for building purposes. The presidency, where President Steyn resides, is also a very palatial building.



PRESIDENT STEYN, OF THE ORANGE FREE STATE.

The Orange Free State is not a forest country, for, like the Transvaal, it is very sparsely wooded. The only mountain ranges in the State are the Stal Mountains, which lie in the eastern portion of the republic. Practically all of the plains are well adapted for pastoral purposes. On the Basuto border there is a golden strip of land, thirty miles broad and 100 miles long, which is considered to be the best bit of grain producing soil in the world.



BOER FORT AT BLOEMFONTEIN.

Think of land that, without irrigation, and with scarcely any cultivation, will raise seventy to eighty bushels of grain to the acre! Wheat, oats, maize, barley and Kaffir corn can all be grown, wild herds of cattle, horses, Angora goats, ostriches and sheep can live and flourish on the veldt.

There are three kinds of regular Government schools. One is the town school, another the ward school and the third the paripatetic school. At Bloemfontein there is a very fine college, known as Grey College, where higher education is carried on. The vast majority of the Free Staters are members of the Reformed

THE OLD DAGUERRETYPES.

Up in the attic I found them, looked in the cedar chest, Where the flowered gowns lie folded, which once were worn by me; And there, in the old jackets and old coats and old dresses, They tell of a worn-out fashion—these old daguerreotypes.

A BOND OF SWEETNESS.

"I'm awfully sorry for Miss Sanders," remarked Mrs. Abijah Smith, "even if she is prouder than a peacock. I s'pose she can't help that, though. All the Sanderses was that way. Poverty and pride ain't good bed-fellows, however."

"That's true as the Gospel," returned Mrs. White, with whom Mrs. Smith was spending the afternoon. "Husband was saying only yesterday that Miss Sanders must find it pretty hard hoeing. But she's got so much pride that she'd die before she'd let any body help her hoe. Folks would be glad to help her if she'd let them."

"Good land! Don't attempt to give her anything!" cried Mrs. Smith in alarm, "or she'll treat you like she did me."

"Well, the other day I happened to run in while she was eating her dinner. She was awful upset, but I made out I didn't notice anything, though it did make me feel bad when I see she hadn't nothing on the table but tea and a few crackers. A couple of days later, I run over with a cake for her. I s'pose she made it for me, says I. Miss Sanders, I just finished baking and I brought over one of my outstaid pies for you to try. Miss Lowe gave me a new recipe. She took it as nice as you please, though I was dreadful afraid she wouldn't, and I was tickled to pieces, but I didn't let on. That was on Thursday, and lo and behold, my name ain't Almira Smith if Miss Sanders didn't come over on Saturday with the elegant raised cake you ever saw. The poor dear just made me take it, though she meant to have staved a week to make up for it."

"Addie White, who had been studying her lessons for the next day, overheard this conversation, and it made a deep impression upon her. "Poor Miss Sanders," she sighed pityingly, "I wish I could help her."

A few days later Addie paid Miss Sanders a visit. "Next Friday I shall be twelve years old, and I'm going to have a birthday party after school," she told her eagerly, "and I thought it would be just fine if you would make some of your elegant cream candy. I'll be sure to have it, you know, for your candy is so good everybody will want all they get. Will you make me some?"

BABY RAN THE LOCOMOTIVE.

A Three-Year-Old's Trip Alone on an Engine Running Wild.

"I can run an engine like papa," said little three-year-old Fred Evans as he was lifted down from the locomotive of the St. John's motor car. He had mounted the engine at St. Johns, pulled open the throttle and remained on the seat alone on a mad ride of seven miles. The young engineer is the son of W. B. Evans, of St. Johns, an engineer on the motor line. He had often been on the engine, and his father had explained to him how the lever is pulled and the wheels started moving.

The engine lies over an hour at St. Johns, just by the water tank, and during this time, while Mr. Evans walked down to the engine, mounted the seat and opened the throttle wide. The machine was full of coal and water, and was ready for the road. Several people saw the boy start, but no one was near enough to catch the track just in time to see the locomotive, with his boy on board, disappear around a curve. The father was wild with grief and fear, and the boy's mother was almost prostrate.

The news spread like wild fire, and the whole town turned out. Excitement was intense, women and children cried and men offered suggestions. Master Mechanic Michael F. Brady was at that end of the line and at once began to telephone to stations along the line. Portsmouth and Peninsula were notified, and men at these points tried to board the engine as it dashed by, but its speed was too great. Mr. Brady also notified the office at Albina, and a party of men ran out the line northward to meet the wild engine. In coming up the long grade toward Albina, the steam still showed eighty pounds. John Woods, a motorman on the City and Suburban Railway, was the first man to meet the engine. He caught the hand rail and swung up, but in doing so he was dragged sixty or seventy feet. He at once turned off the steam, and the engine slowed down and stopped. It was then young Fred made the remark concerning his ability as an engine-driver.

The boy was not scared at all, but seemed rather proud of his feat. When the engine first dashed out of St. Johns he was frightened, and as he came through Portsmouth like a shot out a gun he was yelling lustily for "mama." After coming several miles, however, he again became brave and held his position on the seat with composure, with his hand on the lever, like a veteran.

The engine was stopped in front of the home of Dr. Davis, on Commercial street, and was quickly run back to St. Johns by Mr. Woods with the boy Fred still on board. Mr. Woods said his success in boarding the engine was a surprise to him, as well as every one else, as its speed was still considerable. The engine had made the run from St. Johns to Albina in less than half an hour.

At the same time the news of the rescue had been sent by telephone to the frightened parents, and for the remainder of the day there was great joy in all St. Johns.

Efficiency of Japanese Servants.

Japanese servants are more and more in demand every year in New York City, as their efficiency has been proved and they are looked upon as more capable than any other kind of domestic help. There is one serious objection to them which cannot always be overcome. They lavish their politeness and courtesy on the masculine members of the household in which they are employed and cannot be induced to treat the women with respect. One gentleman who had a Japanese butler said the other day that he was compelled to part with him solely because he could not induce him to say good morning to his wife. "He was always obsequiously polite to me," said his former employer, "and greater respect could not have been demanded, but it was impossible to make him realize that it was his duty to treat the women of my household in the same way. I expostulated with him on this ground and told him that in this country it was more important to be polite to women than to men. That made no impression, and after he had repeatedly refused to give my wife any more than a sullen nod after greeting me effusively, I was compelled to part with him. His explanation was that he left was ignorant. He told me he would be sorry he could not get along and added that it would be a very difficult matter for me ever to find a butler any more polite to the women, as the training of a lifetime was not to be overcome in a few years, and all Japanese would probably act just as he had done when the time came to say good morning to the mistress of the house."—New York Sun.

Pointed Paragraphs.

If you are in doubt about it, don't do it.

In the world's great drama the ocean plays the principal role.

A sample room is dangerous when too many samples are taken.

The man who has nothing to do but clip coupons cuts quite a figure.

Every man has eyes, is, or will be handsome in the eyes of some woman.

The opinions of a child may be of no value, but they are at least honest.

A girl is invariably in love when she refers to the twilight as the gloaming.

The woman who paints her cheeks and the man who dyes his whiskers fool only one person.

A bachelor says that widows weep not because of the loss of a husband, but because of the lack of one.

Probably no person living ever saw a picture of Cupid that looked as though the little fellow had good common sense.

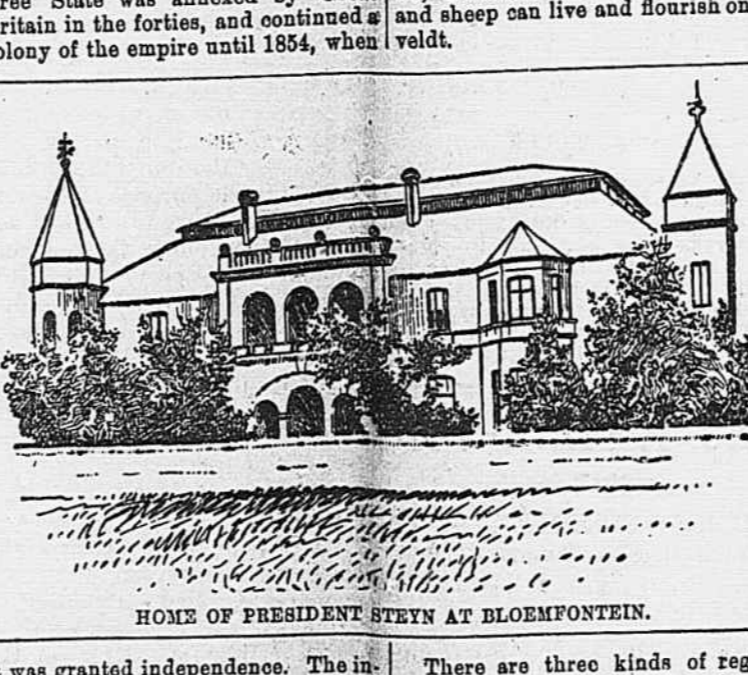
Figures may not lie; but when a girl looks like 160 pounds and only puts the scales down at 116, there is something wrong somewhere.—Chicago News.

War's Millions of Victims.

An army officer estimates that in the century just-closing no fewer than 30,000,000 men have been killed in war in civilized countries.

It was granted independence. The inhabitants then established a government of their own and had progressed satisfactorily until their President, Mr. Steyn, was led by President Kruger into an offensive and defensive alliance against England. That the Boers have for months and even for years been anticipating some

There are three kinds of regular Government schools. One is the town school, another the ward school and the third the paripatetic school. At Bloemfontein there is a very fine college, known as Grey College, where higher education is carried on. The vast majority of the Free Staters are members of the Reformed



HOME OF PRESIDENT STEYN AT BLOEMFONTEIN.

August 21 the squash lifted sixty pounds; August 31, 500 pounds; September 11, 1100; September 31, 2015; October 18, 3120, and October 31, 5000 pounds.

It is a misdemeanor to knowingly pass plugg'd money or to destroy United States currency in any way.