SCIENCE NEWS

GRAFTED POTATOES

Science Service

GRAFTING, a procedure quite common in tree culture, has been applied to vegetables and flowers by a French botanist who has by this method increased the size and yield, created new species, prolonged the life of plants and intensified the perfume of flowers.

Professor Lucien Daniel, of the University of Rennes, has performed grafting operations on cabbage, lettuce, beans, potatoes, tomatoes and various flowers. Other botanists who have examined his results concede that the fantastic experiments made by Professor Daniel hold much practical promise for the market gardener.

One of the first attempts made by Professor Daniel was to graft the black Belgian bean on a large white Soissons bean. From this combination plant he obtained seeds of an entirely new variety of beans which has remained fixed.

He took a bitter variety of cabbage unfit for food, but which resists frosts and grafted on it a variety that has a good flavor but succumbs easily to cold. The seeds of the hybrid yielded a new variety that tastes good and resists cold.

Some of his most sensational grafts were made on the family Solanaceae to which belong such useful plants as potatoes, tomatoes, tobacco and egg plant. He grafted sections of egg plant on tomato vines. First the grafts produced the regular ovoid egg plant fruit and later on the same branch yielded other fruit resembling that of tomatoes. Finally a true hybrid, round in shape, was obtained.

Professor Daniel has also grafted tomato branches and belladonna on potato vines, and potato stems on egg plants and tomato vines. Potatoes, of course, are simply swollen stems or tubers which develop underground. He was curious as to what would happen when he grafted a potato stem on another plant. Would tubers continue to be produced? Yes, they were, but not underground. Large beautiful tubers hung from the branches like fruit. These aerial tubers when planted yielded a new kind of underground potatoes which were more resistant and developed more quickly than those of which they were the offspring.

A still more fantastic discovery was the finding, among these second-generation hybrids, of three plants which bore both aerial and subterranean tubers at the same time. These tubers being harvested and planted yielded a stable new variety rather late in developing, but delicious in flavor, extra large in size and very hardy.

One of the most recent experiments is the double grafting of belladonna and tomato. Upon a tomato stem, a sprig of belladonna was grafted and then upon the latter again a tomato stem. It was found that the belladonna plant had by this operation lost its property of producing atropin poison which is normally found in all parts of the belladonna plant.

A series of experiments with chrysanthemums and other flowers showed that grafting caused flowers in many instances to yield a more pungent perfume, a fact of great importance to the perfume manufacturers of South France. Numerous trials with other plants are now being made of which the results have not yet been announced.

THE FIXATION OF NITROGEN BY YEAST

Science Service

A YEAST has been discovered that is regarded in informed circles as having immense future possibilities in enlarging the available supply of nitrogenous food. It is a variety of yeast capable of assimilating nitrogen directly from the air when grown in solution of sugar and minerals free from any other source of nitrogenous nutriment.

Dr. E. I. Fulmer, of Iowa State College, developed this yeast, known as Saccharomyces Cerevisiae, Race F, from a cake of commercial yeast. The secret of this success lies not only in the race of yeast used, but also in the development of the proper balance of salts and sugar in the medium by methods developed in his laboratory.

Hitherto the only organisms of any economic importance capable of assimilating nitrogen from the air have been the nitrifying bacteria which grow on the roots of clover and other leguminous plants. The nitrogen absorbed by these organisms is not directly available as food for man or beast, but occurs chiefly in the form of nitrates which nourish the following crop.

The new yeast is what may be called a domesticable organism, suitable for direct consumption by man and animals, which does not especially require for its growth a preexisting supply of nitrogen in the form of nitrates or ammonia.

The potential importance of this discovery lies in the fact that it indicates a possible way of utilizing enormous quantities of saccharine materials which now go to waste, especially in outlying regions of the world. For instance, the cane-sugar industry, which is mainly confined to tropical regions, produces vast amounts of molasses for which no market can be found, notwithstanding that large amounts are employed in the manufacture of alcohol and stock feed. Molasses consists mainly in carbohydrate in the form of sugar; carbohydrates in general are the most abundant of the common constituents of foods, but they can not take the place of proteins —that is, foods containing nitrogen. By using cheap and abundant carbohydrates to support the growth of yeast while it is fixing the nitrogen of the air in the form of protein, the economical production of nitrogenous foods may be greatly expanded.

A NEW TUBERCULAR THEORY

Science Service

A NEW theory, which brings closer the solution of tuberculosis and its cure, was submitted to the con-

vention of the American Medical Association by Dr. H. J. Corper, director of the research laboratories of the National Jewish Hospital for Consumptives, Denver, Colorado. This theory holds out the hope of medicinal treatment for tuberculosis, treated mainly with general health measures.

The theory represents three years of research on thousands of animals, since Dr. Corper and two associates discovered that 3 per cent. of carbon dioxide prevents the growth of tubercle bacilli, while 15 per cent. kills them. This discovery explains the prevalence of tuberculosis in the lungs, and the comparative immunity of certain other organs to the disease, since it is a well-known fact that it is in the lungs that carbon dioxide is exchanged for oxygen. The liver, which is supplied with venous blood, and therefore has the highest supply of carbon dioxide in the body, was found to be infected less often than several other organs, which have a higher supply of oxygen.

The indicated cure would be the depositing of carbon in the body by means of the blood, in particles small enough not to block the capillaries, in order to cause a part of the carbon to be deposited in the lungs. Experiments were conducted to determine in what amounts material injected into the veins reached the various organs in the body, and it was found that the lungs received the smallest amount.

Dr. Corper, working with Drs. A. C. Starry and Max B. Lurie, while studying the effect of carbon in tuberculosis in the rabbit, found that carbon administered in liquid suspension intravenously daily for long periods, deposits mainly in the liver and the spleen and to less extent in the lungs, but in sufficient amount to have a retarding influence on the development of pulmonary miliary tuberculosis.

TIMBER DESTROYING INSECTS IN YELLOWSTONE PARK

Science Service

THE great forests of Yellowstone National Park, one of the chief glories of this wonderful region, are seriously endangered by the onslaught of two timber-killing insect pests. So far their ravages have been confined to areas so located that the beauty of the park has not been greatly marred, but unless vigorous and thorough measures are soon taken against them they will do irreparable damage.

The first and probably more serious of these pests is the spruce budworm, which is at work in the Camp Roosevelt region, in the northeastern part of the park. The larva of this insect feeds on the buds and leaves of spruce and fir trees, stripping them naked and leaving them to die. Its area of damage is rapidly eating into one of the most interesting and attractive forests, and dead trees will soon be seen along the roads.

The second pest is the sawfly, which attacks the lodgepole pine. This insect also is a defoliator, killing the leaves by chewing out the soft green parts and leaving a dead shell behind. Its operations are spreading through the forest along the road from the entrance at West Yellowstone, Montana, and will be especially in evidence next season when many of the trees will be dead.

As a means of keeping the epidemics in temporary check, spraying apparatus has been borrowed from the U. S. Forest Service, and poison sprays will be used for a distance of one thousand feet in either direction from the roads through the diseased areas. However, this is recognized by the Park Service authorities as only a relief and not a cure. For permanent results, more thorough measures, going wherever the pests have migrated, will have to be undertaken as soon as sufficient funds shall have been obtained.

ITEMS

Science Service

THE Health Committee of the League of Nations has under consideration the establishment of a center for the observation and dissemination of information concerning epidemics in the Far East. Singapore will probably be selected. Such a center, operating from such a principal southeastern Asiatic port, will be immensely useful to the nations of Asia and to European and American powers having Asiatic possessions and dependencies. It will be able to gain prompt information concerning the outbreak of any epidemic disease, to trace its spread, and to give warning by radio and cable to other ports before the arrival of vessels bearing the infection. The proposal has been sent on to the council of the league for action.

HOW much should ice cream weigh? The Department of Agriculture proposes a tentative standard weight of 4¾ pounds per gallon, subject to discussion and possible change before it is incorporated in state laws. Department officials suspect that neighborhood ice-cream makers now and then take advantage of the fact that their product is sold by volume rather than by weight. Yet there should be a standard density which the public could demand. A few states have adopted laws dealing with this situation. Kansas has the 4¾ standard on its statute books. Wisconsin requires that the volume of the ice cream when melted shall not be less than one half that in its frozen state, as it is manufactured and sold. A few experiments to determine a proper standard have been conducted in Washington.

PARATOLUOLSULFOCHLORAMIDSODIUM is a bleaching powder recently introduced in Germany. Rather, it is an organic compound which may take the place of bleaching powder. During the war it was used as a disinfectant and experimental surgery is still experimenting with it. But its German makers see its greatest future in the housewife's washtub. They claim it is much less dangerous to linen than the average bleaching powder. Its salt derived from this compound also is claimed to have valuable properties as a weed killer on gravel paths. Not being easily soluble in water the rain does not wash it away easily.

A BALSAM fir which may prove valuable in producing wood for paper making has been introduced into this country from China.