

fig insect should be introduced and supplied to them during the present fiscal year. Dr. Howard, entomologist of the department, visited the fig-raising districts of California, in 1898, with reference to the insect problems involved, and Mr. Swingle soon after fortunately originated a new method of shipment, which has made it possible to send the Blastophaga as far as California and assure their arrival alive. This was by wrapping the winter or slow-developing form in tin-foil and sending by letter post. They have now been sent from Italy and from the mountains of Algeria, and, having begun to breed in California, it is hoped they will successfully hibernate there and become regular and useful residents. Small orchards of the caprifig (male) tree will, however, be planted, so that, should a cold snap kill the insect in any given locality, it will be possible to recoup the loss from our own insect farms rather than face the delay and trouble of further introduction by mail. As most of the parasitical hymenoptera are, however, much more adaptable to climatic conditions than are the species of the fig, it is safe to prophesy that Blastophaga will ultimately adjust itself to any region where fig culture will succeed. Now, in California, Arizona, and like regions, where a mild winter is combined with a dry August and September, we may look for abundant success in the fig-drying industry, one which now costs us many thousands of dollars annually on the import side of our national ledger.

THE TRUE ARTICHOKE.—This name is here commonly applied to a tuber resembling the potato, which is now grown in some localities quite extensively for stock feeding and alcohol distillation, but is of little value for human food. This is the "Jerusalem artichoke." The unopened heads of a thistle-like plant are, however, the real artichoke. The latter are a delicacy greatly prized in certain parts of Europe and produced in enormous quantities in France and Italy. The plant, a perennial, does not come true from seed, but is propagated, like the pineapple and many other plants, from suckers.

As the true artichoke is much prized in New Orleans, Savannah, Philadelphia, and New York, having for some time been grown for local use in the former city, it is believed that the general introduction of the plant will be appreciated by the people throughout the country, and a sufficient number of suckers have been imported by the department to early insure their indefinite multiplication. The cultivation of the artichoke should prove to be a profitable venture among our Southern truckers, especially as it is adapted to furnishing a canned delicacy.

A JAPANESE DELICACY.—The Stachys is a vegetable imported into France from Japan and known in its adopted country as the Crosne, from the location of the estate of M. Pailleux, of Crosne, a gentleman who devotes his time and grounds to the culture of new and strange vegetables from all quarters of the globe. This vegetable is perfectly hardy, grows in all soils, and yields up to five tons per acre of white tubers two to four inches long, the size of a finger, looking like a crowded string of beads. It is considered one of the most delicious vegetables known to man.

PISTACHE CULTURE.—The culture of the pistache nut is likely to prove of very considerable value in California, Arizona, and New Mexico. With the exception of the home-consumed product of a few isolated trees, the entire quantity now used in this country is imported and its use is limited almost exclusively to ice cream and confection flavoring.

Along the Mediterranean, where the choicest walnuts and almonds are raised, the pistache is considered the very best of all nuts for table use. It is very nutritious and fattening, and of a delicious flavor of its own, and should soon come to be a leading article of its kind in our markets. Mr. Swingle perfected arrangements by which some choice grafts will reach this country next spring.

DATE PALM CULTIVATION.—While able to withstand considerable frost in winter, this palm must have a very dry and exceedingly hot climate at the time of the ripening of the dates. The sandiest and, generally speaking, the poorest soils produce the best dates; while it will yield in any soil, it takes most kindly to otherwise almost worthless land, even that which is white with alkali suiting it. Still, an abundance of water is at certain periods of its maturing quite necessary.

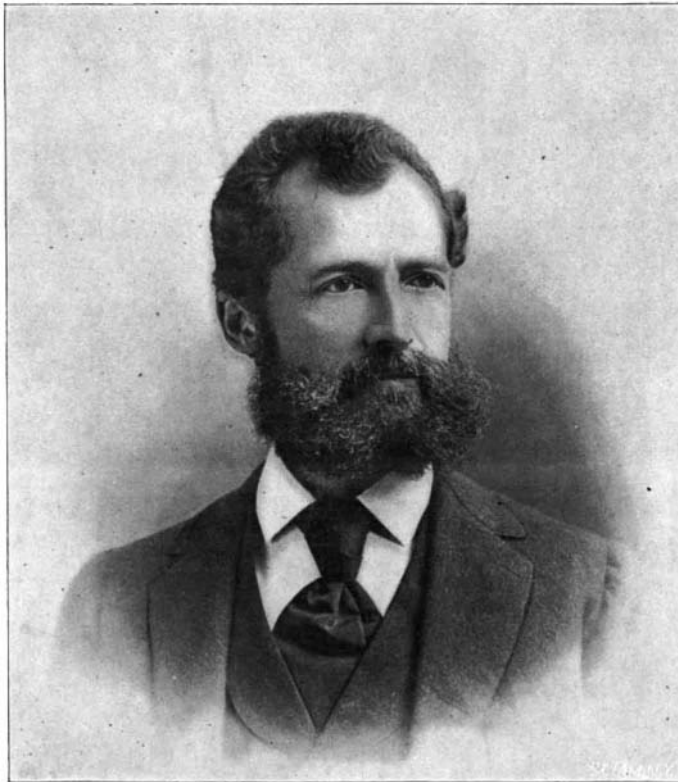
Mr. Swingle has studied date culture in Algeria, and shipments of the suckers of the true Degletnoor date and other choice varieties from the Sahara Desert have already been sent to the Arizona Experiment Station. There investigations show that the best dates will succeed in Arizona. This is pleasing to Secretary Wilson, who has had success in this profitable culture for otherwise neglectable lands much at heart.

THE ST. JOHN'S BREAD.—A most promising forage plant for growth in the warm parts of this country is the carob, or St. John's Bread, a variety of the Leguminosæ. The carob, through the medium of

vast quantities of bacteria, which are parasites upon it, yet not especially harmful, derives its nourishment quite largely from the air, and is, therefore, a productive bearer in poor soil. A full-grown tree will average half a ton of pods, and as much as one and a half tons has been yielded in one season by a single tree in Spain. The pods, which are often eaten by man, make excellent food for horses, cattle and sheep, being very nourishing, containing, as they do, over 40 per cent of sugar, over 8 per cent of protein, and less than 25 per cent of indigestible matter. Enormous quantities of carobs are produced in all the countries surrounding the Mediterranean, where they are a much prized product, none the less because of the fact that they do best on arid soil, where nothing else will, preferring a rocky or calcareous soil near the sea. Although doing well in poor soil and without water, their cold resistance is slight, and they are confined to regions in which the orange will thrive.

Some young grafted trees have been secured by Mr. Swingle from the best sorts in Algeria, and varieties from other lands have been arranged for. There are large areas in the Southwest where it should be a valuable addition, and it is intended to give it thorough trial along the Gulf.

VALUABLE PRICKLY PEARS.—Another forage plant of much promise for the warm and arid regions is the thornless cactus, a species of the prickly pear. Enormous quantities of the "pad," or so-called leaves, in reality flattened branches, are yielded, from ten to fifteen tons per acre being often reported. Yielding only from five to ten per cent of dry matter, and thus being a very watery food, the pads are excellently



OTTMAR MERGENTHALER.

adapted to stock raising in dry regions or seasons, especially where more concentrated food, as cotton seed, is also fed. Varieties of these cacti have been sent from Sicily and others have been obtained from the Argentine. The latter are entirely smooth, even without the minute prickles of the European forms. Both are well adapted for fodder purposes, but the Argentine form also produces delicious fruit, which, however, do not grow if the plant is cut for cattle feeding. In Almeria, Spain, and elsewhere most delicious fruit is raised from the prickly pears, as high as fifteen tons to the acre being sometimes produced. Some of the best sorts have been obtained, and are being distributed to the experiment stations of the Southern and Southwestern States, where they are destined to become a very popular fruit, both for local and shipping uses.

The foregoing is but a brief résumé of the work of one of several explorers under the Agricultural Department's direction: but quite enough is here said to indicate that this fiscal year will be a banner period in the introduction of really promising agricultural experiments.

Appendicitis Caused by the Habit of Crossing the Legs.

A foreign surgeon has put forward the suggestion that appendicitis is caused by the habit of crossing the legs, which restricts the action of the digestive apparatus. The appendix is only loosely attached to the cæcum, and there is always some half-digested food in the cæcal bag. By crossing the legs there is liability that the undigested food may pass into the vermiform appendix and set up an inflammation, in a few hours pathological processes set in, and an attack of appendicitis is developed.

THE DEATH OF A GREAT INVENTOR.

In the death of Ottmar Mergenthaler, who died at his home in Baltimore, October 28, America loses one of her foremost inventors, the creator of the "linotype" machine which bears his name. Mr. Mergenthaler was born in Würtemberg on May 10, 1854. His father was a teacher in the public schools of the kingdom and tried to have his son enter upon the same profession, but the bent of the latter's mind was for mechanics, and he spent much of his time in watching machinery in motion and in the study of problems of mechanics. Finally he was apprenticed to a watchmaker, and while learning his trade attended night schools and schools which were open on Sunday. His term of apprenticeship expired in 1872, and to avoid enlistment in the army he came to the United States, landing in Baltimore, and he soon secured a place in Washington where electrical and experimental work was carried on, and most of the necessary experiments on the electrical instruments used by the United States Signal Service were carried out under the direction of Mr. Mergenthaler. He came in contact with many inventors, and soon demonstrated that his life work was to be one of them.

In 1876 he became connected with a mechanical engineering firm in Baltimore, and made his home in that city. A Washington stenographer, named Clephane, who had made a study of writing and printing machines, employed the Baltimore firm to make some models for him, and Mr. Mergenthaler showed such aptitude for the work that he began experimenting on his own account, and for four years he devoted all his spare time to the invention of typesetting machines. His first idea was a rotary machine, with keys for impressing female dies in a continuous strip of heavy paper, which was cut into short lengths for adjustment as the matrix of a column of type. This was superseded by a machine controlling a series of sliding parts, each bearing on one edge all of the characters and spaces. A key mechanism moved these bars endwise, so as to bring a selected character on any bar in line with the selected character on any other, and thus form the matrix of a complete line of casting.

In 1880 he made a complete change of system and adopted the plan which he brought to perfection in the linotype machine, which is used in newspaper offices nearly all over the world. The machine is operated by a keyboard something like a typewriter. These keys set a line of key dies or types, justify them to the exact width of a column or any required measure and cast them into a solid line of type metal. Two machines were built on the same principle, and one was tested in the summer of 1884. It worked smoothly and silently. The matrices slid into their places, were clamped and aligned, the pump discharged its contents, and the finished linotype was the result, the matrices returning again to their normal positions. All this was the work of fifteen seconds. In February, 1885, the second machine with an automatic justifier was completed and put on exhibition in Washington, and was visited by President Arthur, James G. Blaine, and others. The linotype at that time was satisfactory, though not perfect; no tabular work could be

done on it, and the operator could not correct an error without discarding all that part of the line which had been formed prior to the discovery of the mistake which had been made. Mr. Mergenthaler set to work to overcome this defect and finally accomplished it.

At first he had difficulty in obtaining capital to manufacture the machines, but finally it was raised, and the machine was finally perfected in 1885. It was arranged so that the line was assembled in view of the operator, and he could make corrections as he proceeded, or he could insert, by hand, any character not carried in the magazine, but the machine could not produce tabular matter. The first of these new machines was installed in the composing room of the New York Tribune in July, 1885, and after this time they came into general use. The 1886 machine required an air-blast for propelling the matrices, and had other imperfections, which Mr. Mergenthaler set himself to rectify. He was weakened by overwork, and he was seriously ill in the fall of 1888. He finally recovered, and the company was reorganized. In 1890, one hundred machines were contracted for. In 1891 there was another reorganization of the linotype company. In January, 1894, the practical method of justification by step justifiers had been devised by Mr. Mergenthaler, and about that time the company bought the wedge justifier, for which it paid \$416,000. In 1894, Mr. Mergenthaler's physicians stated that he had consumption, and he was obliged to relinquish personal control of the Baltimore factory. This ended the public life of one of the most remarkable inventors America has ever seen, and to him will be assigned a high place in the annals of the art preservative of arts.

THE engines of a first-class man-of-war cost about \$700,000.