The Mexican Cotton-Boll Weevil and the Damage It Has Caused This Season.

The most serious menace that the cotton planters of the South have ever been compelled to face is the Mexican boll weevil, which is ravaging the cotton fields of Texas. The weevil has not been found outside that State except in the instance which occurred in August at the Louisiana Sugar Experiment Station at Audubon Park in the environs of New Orleans. In that case the circumstances have led the Louisiana authorities to the conviction that the pests were purposely placed in the cotton plots by some interested person. The station authorities promptly destroyed all the cotton of the experimental plots by picking the fallen fruit, uprooting and burning the plants, and subsequently plowed and flooded the land after it had been thoroughly sprayed with crude petroleum. As there are no cotton fields within 10 miles of Audubon Park, and several examinations by the station entomologist failed to reveal any weevils, it is very probable that the colony was completely exterminated.

The difficulties in the way of controlling the boll weevil lie as much in its habits and manner of work as in the peculiar industrial conditions involved in the production of the staple in the Southern States. The weevil lives in all stages, except the imago, within the fruit of the plant well protected from any poison that may be applied, and in that stage takes food only by inserting its beak within the substance of the plant. It is remarkably free from the attacks of parasites and diseases, occupies but fourteen days for development from egg to adult, and the progeny of a single pair in a season may reach 134,000,000 of individuals.

The weevil adapts itself to climatic conditions to the extent that the egg stage alone in November may occupy as much time as all the immature stages together in July or August. These factors combine to make it one of the most difficult insects to control.

The territory at present affected by the boll weevil is entirely in Texas. The nearest approach to the Louisiana line is in the immediate vicinity of Timpson, 25 miles away. The nearest approach to Shreveport is in Wood County, about 100 miles distant. On the north it has been found in the vicinity of Sherman just south of the Red River. In the region between the latitude of Greenville and the Red River the weevil is only scatteringly present and has caused no general damage. It will require nearly two years for it to reach such numbers as to materially reduce the normal production. Although many conditions make it very difficult to reduce to figures the damage caused by the weevil, calculations made in the Division of Entomology of the U. S. Department of Agriculture, based upon statements showing the production of cotton in ten leading counties in Texas when the boll weevil was absent and when it was present, and showing the increase in ten other counties when the weevil was absent at both similar periods, appear to justify the estimate that the total damage caused by the insect is about 50 per cent. Upon that basis the Texas planters have suffered a loss of $15,000,000 during the present season, and this estimate, it is stated, agrees with those of conservative cotton statisticians. As the normal cotton crop of the United States is estimated to represent a value of $500,000,000, the probable ultimate damage, when the pest has become spread over the entire cotton belt, provided nothing were done to check it, would be in the neighborhood of $250,000,000 annually.

Nevertheless there are conditions at work that seem to indicate that planters in weevil regions are gradually adopting changes in their system of producing the staple that have a tendency to avoid damage.

The work of the U. S. Department of Agriculture with the boll weevil consists of field experiments and laboratory investigations. Mr. W. D. Hunter, of the Division of Entomology, assisted by several entomologists, has charge of the investigations in Texas, and Mr. E. A. Schwarz of the Division has conducted studies in Cuba. The field work comprises tracts of cotton grown in such manner as to constitute demonstrations of the means necessary in order that the staple may be produced profitably in spite of the weevil. These fields are located in six different points representing the five regions in Texas, which, by reason of variation in climate and soil, constitute as many distinct cotton districts. In these fields every expedient that has been found to be useful in avoiding damage by the weevil is being tried. The work of the Division of Entomology during the season of 1902 demonstrated that it is possible to produce cotton profitably in spite of the weevil; the work of the present season shows this again under different conditions of climate and soil, and in addition furnishes practical demonstrations of the value of the recommendations of the Division to planters at six different points in the State. In the laboratory the life history of the pest is being carefully investigated. In addition, Mr. Schwarz has spent several months of the present year in Cuba, studying the manner in which natural conditions, whether of parasites, diseases, climatic conditions, or of bringing about a degree of resistance on the part of the plant, control the insect where it has existed as an enemy of the cotton plant for a much longer period than in the United States. He found what he supposes to be the original food plant of the insect in the "algodon de riñon" or kidney cotton of that island. He failed to discover any parasites at all and did not succeed in finding any important tendency toward immunity on the part of the five distinct varieties studied.

The steady extension of the territory affected by the weevil year by year until the northern boundary is far north of the center of cotton production in the United States has convinced all observers that it will eventually be distributed all over the cotton belt. Although its progress has been comparatively slow during the time it has been in Texas, it has displayed no tendency toward dying out.

The fact that several European governments are sending agents to this country to procure seed to be used in experiments in producing the fiber in their colonies calls attention to the probability that the weevil may be carried to remote portions of the globe. Although the insect does not, except accidentally, hibernate within the hull of the seed, every seed house attached to a gin in the infested territory harbors any that are brought in from the fields in seed cotton. They crawl into the seed bins as they would crawl anywhere for protection. All danger could easily be avoided by fumigation of the seed or by leaving it sacked in storage rooms isolated from new cotton for a year previous to shipment.

The work of the Division of Entomology has demonstrated that no direct or specific means, such as poisons, will ever be of much avail in fighting the weevil and that there is little hope for the artificial propagation of diseases or in obtaining a variety that is in any sense resistant. Experiments, however, with cultural methods have been highly successful and have obviated the necessity of looking to direct ones.

The cultural methods consist of reducing the number of the pests in the fall by early destruction of the plants and in hastening the maturity of the crop the following spring by every means available. Fall destruction consists of plowing up and burning the plants as soon as the pests have multiplied to such an extent as to render the picking of any more cotton doubtful. Under normal conditions this should occur some time in October. The benefits resulting from this process are threefold. Many weevils are actually killed, the development of several of the so-called broods is prevented, thus further reducing the number which go into hibernation, and, moreover, the hibernating season, during which many causes bring about a considerable mortality, is lengthened.

While this apparently causes a loss of the top crop, it is not a loss when the other recommendations of the Division of Entomology are followed. A crop can be obtained which will mature before the weevils have an opportunity to do considerable damage, and this is brought about by the use of a rapid-growing variety accomplished by the planting of northern seed. This must be planted early when the season permits; the rows must be planted at a somewhat wider distance than has been the practice, and a thorough cultivation of the crop must follow. In this way it has been shown the past season that from a half bale to a bale per acre can be cropped in territory where under the old system one-tenth of a bale more or less is secured with difficulty.

By these methods it is possible to produce the staple at a margin of profit that will compare favorably with that realized in the production of most of the staple crops of the United States, even though the large yields of cotton occasionally gained in earlier years seem no longer possible in the districts affected by the weevil.

Slight Display of Leonids, A.M. November 16, 1903.

BY PROF. EDGAR L. LARKIN.

A watch was maintained for Leonid meteors at this observatory, from 0h. 40m. to 2h. 5m. A. M. on Monday, November 16, 1903. The display was feeble indeed when compared with the magnificent shower observed here on November 15, 1901, when 661 were recorded. Twelve Leonids were seen this year; the first being at 0h. 44m. and the last at 2h. 5m. A. M. Pacific time. They were all from within the sickle of Leo; two from the radiant point, that is, almost exactly "head on." The first from radiant was at 1h. 4m., and the other at 1h. 22m., and were equal in brilliancy to Gamma Leonis. The brightest meteor was equal to Arcturus, the others small. At 2h. 5m. a mountain fog condensed, ending the watch. No observations were made on the morning of the 15th, owing to fog. At 6h. 10m. and at 6h. 23m. P. M. on November 14, two meteors were seen in the south, in thin fog; and from the illumination of the vapor, it was thought that their brilliancy was as intense as that of Jupiter, which was shining through the same layer. At 5h. 30m. A. M. a bright light flashed in all the rooms of the observatory, which must have been from a large meteor, as quite a dense cloud inclosed the peaks and building at the time. This was on Sunday morning, November 15, 1903.

Lowe Observatory, November 16, 1903.

THE OBELISK OF MONT PELÉ.

Mont Pelé stands unique in the history of volcanoes in more than one particular. A little over a year ago, scientists who were studying this volcano discovered a peculiar tooth-like formation growing out of the old crater. Owing to the quantity of vapor and smoke which covered the mountain, this formation was not observed until it had grown to a height of 295 feet above the rim of the crater. The formation could not be mistaken for a cone, such as is commonly formed in craters by the heaping up of matter ejected from the volcano, since the sides were quite smooth, and approximately vertical, as shown in our front-page illustration. It had rather the appearance of a solid shaft of stone, and was hence called the "obelisk of Pelé." From the time it was first discovered it steadily increased in height, and when measured in the latter part of March, 1903, it was estimated to be 5,143 feet above the level of the sea, or 1,109 feet above Morne Lacroix, but this did not mark the maximum height, because a period of heavy volcanic explosions had reduced it somewhat and caused its form to undergo many changes. Thus, during the spring and last summer it constantly altered in height and general appearance, sometimes rising a number of yards, and then, following a period of explosions, being reduced again. From the time of its measurement in March, the losses exceeded the gains until it finally disappeared within the cone which had been formed about it. This cone seems to be made up of lava and ejecta which have been forced up from the vents, and of masses which have been shattered from the obelisk.

The peculiar phenomena of the obelisk have awakened great interest. How such a huge monument, taller than the Effel Tower, could be formed on the top of a violently active volcano is a problem that is not easy of solution. As far as we can ascertain, only one plausible theory has been advanced, and that does not seem very credible; namely, that the needle was formed of molten lava during some previous period of activity, that this lava solidified and formed a plug which closed one of the passages of the crater, and that now it has been worked loose and forced up by the recent renewed activity. The obelisk does have the appearance of having been forced up in a solid piece like a stopper in the bottle, and held by friction against the sides of the opening. The northeast side of the obelisk is very smooth, almost polished in appearance. Its true color, however, is a reddish brown partly covered with a whitish incrustation. On the southwest side fresh surfaces are constantly appearing, owing to the explosions, which cause portions to continually fall off. This side has a gray or reddish-gray appearance. It is impossible at the present time to state just exactly what the nature of the needle is, though in all probability it is largely pumiceous, which is judged from the fact that masses break off from it so easily, and also because of the abundance of pumice found in the vicinity of the Rivière Blanche.

These particulars have been abstracted from an elaborate discussion of the phenomena of Martinique by E. O. Hovey, published in full in the current SUPPLEMENT. Mr. Hovey was twice sent to the scene of the volcanic eruptions for purposes of study—once by the American Museum of Natural History, and once by the National Geographic Society. The photograph reproduced on the front page of this issue was taken by Mr. Hovey for the American Museum of Natural History.

The Current Supplement.

Emile Guarini concludes his account of the Viennese Metropolitan Railway in the current SUPPLEMENT No. 1457. Dr. O. Boudouard discusses at length the subject of "Alcohol as a Motive Power." A tandem compound express locomotive for the Russian imperial railways is described. "Some Engineering Features of Drainage" is a subject which C. G. Elliott, drainage expert of the Department of Agriculture, treats in a masterly way. Recent advances in Roentgen ray apparatus are outlined and illustrated. Dr. Salmon's paper on "Infectious and Contagious Diseases of Farm Animals and Their Effect on American Agriculture" is concluded. William Finn tells much that is interesting about the influence of sunspots upon electrical and magnetic forces of the earth. O. F. Cook's article on the Central American rubber tree is concluded. Mr. Walter J. Turney describes some interesting experiments with ultra-violet light and the electric discharge.

A correspondent suggests to us that some one ought to invent a movable cellar step which, when trod upon, will turn off a switch and thus extinguish all electric lights. There are undoubtedly so many careless warehousemen, that a device of this character could be readily introduced.