THE PASSING OF AMERICAN PLAGUES.

BY GEORGE ETHELBERT WALSH.

Ancient Egypt in all her tribulations had no more disastrous plagues of flies or lice than were the great insect scourges which visited different sections of the United States in the past, and the gradual passing of these plagues before the work of science marks a new era in our agricultural and industrial life. The story of the terrible scourges form dramatic and picturesque background for the history of the great West, and they are intimately wrapped up and interwoven with the struggles and discouraging hardships of a race of pioneers who lived their tragic lives to conquer an empire for future generations to enjoy. Counties and States equal to half of continental Europe were visited by the plagues of locusts, chinch bugs and grasshoppers, and their entire vegetation laid as bare and waste as if swept by fire.

Some recent statistics have been compiled by the Washington agricultural experts which tend to show that back in 1867 the total annual loss to the farm crops of this country from insect ravages amounted in round numbers from $200,000,000 to $300,000,000. One well-informed expert places the losses even higher, or about $330,000,000. These losses were sustained in different parts of the country, and included insects which attacked the grain, corn, fruits and animals of the farming States. Some years the breaking loose of hordes of well-known insects of grain or fruits would totally destroy the crops and cause such general distress and poverty that starvation seemed to threaten the inhabitants of entire counties and States.

The great locust plagues were among the earliest of the West and Northwest, and those who remember these terrible visitations will never forget the conditions under which farmers were forced to live for months at a time. Men became frightened and paralyzed with fear; prayers were offered up in churches and public places to remove the awful plague, and even executive proclamations were issued by the Governors of the afflicted States calling for general supplication for divine aid in removing the visitation. In 1877 the Governor of Minnesota issued such a proclamation, appointing the 26th day of April as a day for prayer throughout the State for this purpose. In 1873 considerable damage was done to the grass and grain crops by the locusts which appeared in southwestern Minnesota, and by the following season they had spread so that they caused general alarm. Millions of the creatures appeared, and they swept across the country destroying every green thing in their way. So great was the destruction to the crops that an appeal was made to the Legislature the following winter, but nothing was done to check the scourge, and in 1875 the swarms had multiplied tenfold.

During that summer, and the two succeeding ones, the scourge spread with alarming rapidity throughout the State, and into adjoining States, until there was such a succession of crop destructions that the inhabitants were reduced to starvation. Efforts were made then to destroy the plague and to invent some means of checking its further spread. Coal oil was distributed throughout the infected districts to destroy the insects, but this primitive and clumsy method seemed to have little sensible effect in diminishing their numbers.

Farmers and their families spent their summers in destroying locusts. In the Dakotas and Iowa their numbers became so great that people were in despair. It was impossible to raise crops. If they were raised the swarms of locusts would destroy them before they could reach maturity. By the spring of 1875 and 1876 the great Northwest had nearly reached the limit of patience. Bankruptcy stared the whole northwestern group of States in the face. In the autumn of 1876 the Governors of Minnesota, Missouri, Kansas, Nebraska, Dakota and Iowa met at Omaha to discuss the plague and devise some means of averting the ruin that was paralyzing their fertile land. Eminent entomologists met with the Governors in this conference, but all that science could suggest had been tried, and the conference broke up without anything more definite being reached than the calling of a general day of prayer.

A strange coincidence, or, as some will have it, a divine answer to the public prayers, followed the 26th day of April set aside for this purpose. A few warm days brought the locusts from their winter hiding places in great numbers, and then a cold wave suddenly developed in the Northwest, and the unhatched larvæ and young locusts were almost totally destroyed by the frost which spread over the whole afflicted sections.

It was estimated that billions and billions of eggs of the locusts and their young larvæ were destroyed by this cold wave, coming, as it did, right after a few days of balmy spring weather. It was the only thing that saved the Northwest from bankruptcy and from a period of depression that would have lasted to this day. The millions of dollars lost through crop destruction had caused many to emigrate from their homes, leaving their farms in many instances just as they were, and fleeing from the plague as did the ancient Egyptians. The awful screech and noise made by the locusts maddened and crazed men, women and children, and the days became horrible nightmares which have never since been equalled.

The locust plague passed years ago, and for twenty-five years there have been only occasional reminders of it in visitations of the insects in a few isolated sections. There has been no general spread of it as in 1873-76. Under modern methods of checking insect development it would be impossible for the locusts ever again to multiply in such vast numbers. There are great locust plagues occasionally in South Africa and South America, and they spread as thickly over the country as they did in the Northwest a quarter of a century ago; but it is not likely that another such visitation will ever appear in this country.

Another great plague, which visited the West fifteen and twenty years ago, and which occasionally develops into huge proportions to-day, is that caused by the chinch bug, which has until quite recently been called the "costliest insect in America." This famous bug has caused a hundred million dollars' worth of damage to crops in a single year. As far back as 1850 the bugs appeared in such numbers that the grain crops of a single State, Illinois, were damaged to the extent of four million dollars. It had appeared previous to this in Indiana and Wisconsin, causing considerable injury to the crops. Periodically it appeared then in great numbers in widely separated regions. In 1863 to 1865 it caused great damage, but in 1871 it caused a total loss of over $70,000,000 to the farmers. But even this was merely a slight indication of what it might do in time. In 1874 it broke loose in Iowa, Missouri, Illinois, Kansas, Nebraska, Wisconsin and Indiana, and caused total losses of about $100,000,000. After that season the ravages decreased a little, but reached another great climax in 1887, when the bugs caused fully $60,000,000 worth of injury to the grain crops. As late as 1896 a chinch bug plague appeared in the West, and caused considerable damage. Altogether the successive plagues of this tiny insect have caused losses to the farmers of the country amounting to over $330,000,000. Such an immense total is sufficient to make this insect occupy a prominent place in the natural history of the great Northwest. No other insect of either hemisphere has probably caused quite such immense damage, although the Rocky Mountain locust or Western grasshopper stands prominently among the most disastrous of our insects. In 1874 the losses incurred by the ravages of the locust were estimated at $100,000,000.

The chinch bug, unlike the grasshopper or locust, has not yet lost its power for evil, and its reappearance in great numbers may be looked for almost any year; but it would be met by far more destructive agencies than in the past, and all the resources of science would be enlisted in the fight against it.

The chinch bug is a pretty small insect to cause so much trouble, and it is hardly discernible to the naked eye, but each female lays about 500 eggs in a season, and the newly hatched insects are very active. The favorite diet of the insects is grain, grass, sorghum, broom corn and Indian corn. Most of the damage has been done in the West to such crops as wheat, barley, rye and corn. The insect has remarkable immunity from attacks by ordinary enemies, a disagreeable odor emanating from it which protects it from many predatory insects which would otherwise keep down its numbers. There are a few natural enemies to the chinch bug, and entomologists have made a study of different insects and diseases which tend to destroy the creature. Efforts have been made to spread parasitic diseases among the chinch bugs to destroy them. The effectiveness of these different methods is not entirely satisfactory, and science is still laboring to find some means of counteracting another plague of chinch bugs should it break out in the great grain growing regions of the West. There is at present no absolute assurance that another chinch bug plague may not visit this country in the near future. The chief guard against any such dire visitation is found in the close watch kept upon the insects in different parts of the country. As soon as there is a slight outbreak in one section of the West, attention is called to that region, and every effort is made to destroy the eggs and larvæ of the insects before they have had the opportunity to multiply in great numbers. The passing of all these plagues is due chiefly to this eternal watchfulness kept upon the creatures and to the immediate steps taken to destroy the eggs and larvæ at an early stage. In this way no great swarms are ever permitted to get the ascendency.

In the South the greatest insect plagues have been those which attacked the staple farm crop of that section. Cotton's worst enemy has been the cotton caterpillar or cotton worm, and the boll worm. The former caused annual losses to the cotton industry in the South of some $15,000,000, and twice in the memory of man the damage amounted to over $30,000,000 in a single season. The cotton caterpillar has always been with the planters in the South, and periodic visitations occur.

ROBERT BACH M'MASTER.

It is with sincere regret that we record the death in this city on the 13th instant of Mr. Robert Bach McMaster. For several years, and up to the time of his decease, he was connected with the Patent Department of the SCIENTIFIC AMERICAN as an associate attorney in conducting the business pertaining to interference proceedings before the Patent Office, as well as other law matters connected with trade-marks and copyrights. In this work he early gained the reputation of a careful, painstaking, industrious and honest lawyer, winning the esteem and friendship of all who became acquainted with him.

Mr. McMaster was born in Brooklyn, N. Y., in 1847 and was the grandson of Robert Bach, well known in that borough in the early years of the last century. His education was received in the public schools of this city and in the College of the City of New York, from which he graduated with honors in 1868.

After studying law in Columbia Law School and being admitted to the bar he turned his attention to the further study of law relating to railroad corporations, and in 1872 "McMaster's New York Railroad Laws," prepared and compiled most carefully, was published and was highly regarded as a work of superior value. He also published notes on "The Business Corporation Act of 1875."

Subsequently he made patent law his specialty and rose steadily to an honorable place at the patent bar.

One of the most noted cases as associate attorney with Mr. William McAdoo, that Mr. McMaster carried to a successful issue, was the Rahtjen Paint Composition Trade-mark case, which was appealed to the United States Supreme Court.

The case established the doctrine that where a trade-mark applied in the United States to an article patented in England, but not in the United States, the trade-mark became public in the United States when the English patent expired.

His ability as an attorney, his sterling integrity, open-handedness and sweetness of character won for him a lasting place in the affections of a host of friends.

There survive him a brother, Prof. John McMaster, of the University of Pennsylvania, author of "McMaster's History of the People of the United States," and a sister, Mrs. Mary McMaster Metcalf.

In Washington, where he was frequently called to conduct important cases, he enjoyed the esteem and confidence of his many acquaintances in the Patent Office, displaying unusual ability in the management of evidence for the best interests of his clients and employers. He discharged every trust with zeal and ability.

His presence will be greatly missed, but the memory of his whole-souled, honest, unselfish character will be cherished most by those who knew him best.

SCIENCE NOTES.

The South Kensington Museum, London, has been presented with the famous Walsingham collection of micro-lepidoptera, consisting of 200,000 specimens, and upon the collection of which Lord Walsingham has been engaged for thirty years. The Walsingham collection is the largest and the most important in existence. It includes among others the famous Zeller collection, and also those formed by Hofmann and Christoph. The specimens embrace many of the originals selected as standard types by various authorities who have written on the subject.

The time-honored rule that moss grows on the north side of a tree, a rule which forms part of every woodsman's catechism, and which he would no more dispute than one of the Ten Commandments, has received a few sharp blows from Henry Kraemer, of Philadelphia. An investigation which he has conducted shows that on 10 per cent of the trees which he examined moss grew on the west side; 10 per cent on the northwest side; 20 per cent on the northeast side; 35 per cent on the east side; and 15 per cent on the southeast side. What becomes of the old rule after such iconoclastic investigation?

Four years ago the Belgian Government offered a reward of $10,000 for the discovery of a paste for matches, not containing white phosphorous, in order to mitigate the evil influences which the present manufacture of matches exercise upon the employees. The arbitrators, however, although they have tested several so-called harmless mixtures, have not yet discovered one that fulfills the required conditions, since all the mixtures so far submitted have been defective in inflammability, igniting on all surfaces, or, in igniting, ejecting inflammable matter containing poisonous substances. The matter is of supreme importance to Belgium because match making is one of the staple industries of the country, but the mortality in the manufactories is very high, the prevalent complaint being phosphorus poisoning.