

colonists to take possession of the lands and develop them, and even had their rights and property possessions been respected and encouraged by the authorities, the warlike condition of the native population would have made their wealth somewhat precarious. It was only along the coast and on the outskirts of the few large towns and cities that anything like civilized settlement of the Philippines was undertaken. With the restoration of peace, and adequate laws to protect settlers and Filipinos alike, there should come an industrial awakening which will in a short time transform these fair islands into gardens of wealth and attractiveness.

Adequate steps have already been taken to protect the valuable timber growing on the vast forest domain of the Philippines of some 50,000,000 acres, and indiscriminate destruction of the trees will not be permitted. The forestry department in the islands has been carefully organized, and expert foresters are in charge. Besides protecting the timber from the vandals and lumber speculators, the foresters are making careful surveys of the woods to ascertain their actual resources and value. Much of this timber is too valuable for building purposes, the trees for the most part consisting of the heavy hardwoods of the tropics, and it is intimated that it will pay to ship cheap pine lumber from our Pacific coast for building and bring back the heavy woods for commercial cabinet purposes. If such an exchange of products is desirable, the work should be encouraged at the beginning, and not left until half the valuable timber of the islands has been destroyed. It is the policy of the forestry bureau on the islands to protect the forests, and to encourage their scientific culture. This will insure an annual crop of valuable trees, and at the same time preserve the woods for all time. In the tropical woods of the Philippines the trees grow so rapidly that a thinning out process can be pursued, so that millions of feet of valuable timber can be cut every year. It is possible to go over the same forests year after year and find new available timber ready for harvesting. There should be a steady income from these hardwoods of the islands amounting in the aggregate to millions of dollars. As conducted in the past, the forests have practically yielded the government nothing, and the inhabitants have wasted their resources, so that they have found little actual profit in their great natural possessions.

Scientific experts who have examined the forests of the islands intimate that the greatest calamity which could possibly visit our insular possessions would be the denudation of the forests. The climatic changes that might follow would completely transform the conditions of agriculture. On the other hand, judicious cleaning up of woods and swamps would produce beneficial changes of an agreeable character. There are water courses and streams which might well be reduced in volume and intensity without interfering with the agricultural conditions elsewhere. The final policy of forest culture which the experts will recommend will probably tend toward the climatic and agricultural improvement of all the islands. There will be openings for the new American colonists who will undertake scientific forest culture of the most promising kind. The possession or leasing of these forest lands will be regulated in such a way that denudation will be visited by prompt ejection and punishment. But it is unlikely that an owner of hardwood timber lands that furnish a good income each year will decide to kill the goose that lays the golden egg. The export trade in valuable hardwoods will increase in proportion to the scientific culture and harvesting of the forests by settlers who have been trained for the work. Expert foresters represent to-day a new profession in this country, but their services in our island possessions will be even in greater demand than at home.

This class of new settlers will be of a higher grade than those who file petitions for the ordinary 160 acres of homestead farming land to secure title by living on and cultivating the same. Expert foresters are not numerous, and their services are needed to develop the forests. It is not possible that others will secure possession of the valuable timber lands of the Philippines, so strict is the forestry department of the islands. On the other hand, there will be urged the necessity of intelligent settlers undertaking the development of forest farms. Under the direction of public foresters it is possible to train a class of practical farmers who will wisely conserve the interests of both the government and the settlers. The small settler is more likely to preserve his possessions of hardwood timber than the lumber speculator, whose chief interests are concerned in robbing the forests of all he can secure in a few years. Forest culture of the hardwoods may thus become an important industry of the new colonists who go to the Philippines under the homestead law.

The time is apparently ripe now for making inducements to attract settlers to the new public domain of the United States, and both the Secretary of War and the Insular Bureau have been urging Congress to enact some homestead legislation. There is little possibility of a great industrial and agricultural development in the islands without some inducement being held forth

to American settlers. There are some forty to fifty millions of acres of land in the islands which belong to the Federal government, and much of this is the richest of agricultural and mining land. The disposition of this vast domain must carry with it a great amount of responsibility for those who have the matter in charge. Land records have been very loosely kept in the islands, and a good many of the natives claiming land have no deeds or other titles to show that their possession is a legal one. To determine the legal ownership of great tracts of the land will require years of study and survey, and possibly numerous decisions of the Supreme Court. But outside of the land which is held in dispute there is a vast tract of which the government has unquestionable ownership, and the opening of this public domain to American settlers according to the homestead rights will be sufficient to attract thousands of new colonists to the islands.

G. E. W.

MORSE'S OLD DIARY AND ITS PROPHECY.

In the Electrical Review there appears a portion of the diary kept by Samuel F. B. Morse during his earliest work on the Baltimore and Washington telegraph line in 1843. The book was discovered in the library of Thomas A. Edison, at Orange, N. J., and contains what are evidently the first records.

The first entry in this diary is dated March 14, 1843, and consists of a copy of the letter from the Secretary of the Treasury, J. C. Spencer, giving instructions as to the handling of the appropriation made by Congress for this experiment. The reply of Morse and other correspondence in the diary give a striking idea of the troubles which beset the pioneer's work, as well as of the untiring energy with which the inventor developed his great ideas. He never seemed to lose heart over the failures of others, which he had to overcome constantly. Under date of August 10, 1843, Mr. Morse describes certain tests he had made, and makes the following interesting prophecy:

"The practical inference from this law is that a telegraphic communication on my plan may with certainty be established across the Atlantic. Startling as this may seem now, the time will come when this project will be realized."

Commenting on this prophecy and old-time record, which is virtually the story of the beginning of the vast electrical industry of to-day, the Electrical Review says:

"How well this prophecy has been fulfilled! To-day there is no ocean unspanned by a telegraphic cable. This old record of the first work in telegraphy takes added interest from our latest accomplishments. We have completed the first Pacific cable and have made a good start on the second, and Marconi has established communication across the Atlantic without wires. It is difficult to realize that this diary was written less than sixty years ago. Who will venture to predict the electrical developments of the next sixty years?"

WIRELESS MESSAGES TO A MOVING TRAIN.

On the occasion of the recent Forty-seventh Annual Convention of the American Association of General Passenger and Ticket Agents, the Grand Trunk Railway gave a demonstration of wireless telegraphy on a moving train. The experiment was entirely successful.

The demonstration was made by Dr. E. Rutherford, F. R. S. C., and Dr. Howard T. Barnes, F. R. S. C., both of the Macdonald Physical Laboratory of the McGill University, Montreal. Signals were exchanged between a station and a train (which was running at the rate of 50 miles an hour). No attempt was made to cover distances comparable in length with those attained by Marconi and others, but with comparatively simple laboratory apparatus it was possible to keep the train in touch with the station for from 8 to 10 miles. St. Dominique was selected as the transmitting station, where two large metal plate vibrators 10 x 12 feet, connected with an induction coil of the usual pattern, were situated. On the train itself the waves were received by collecting wires connected to a coherer of nickel and silver powder. The relay operated electric bells in three cars. The collecting wires were run through the guides for the train signal cord, and extended on both sides of the coherer for about one car length. To obtain the maximum effect it would have been better to have had a long vertical wire, but since such was impossible, the horizontal wire was used. Although these were placed *inside* the steel frame cars, strong and definite signals were obtained over the distance named. Another difficulty militated against obtaining the maximum sensitiveness, as owing to the natural vibration of the train resulting from its great speed, it was impossible to have the relay adjusted to its most sensitive point. In spite of these difficulties the distance to which signals could be sent to the train was eminently satisfactory, and with more refined apparatus greater distances could without doubt be covered. The success of this form of wireless telegraphy, of which this was but a pioneer experiment, opens up yet another method of providing for the safety of the traveling public.

SCIENCE NOTES.

It is rumored that A. Lawrence Rotch, of Boston, is to lend his aid in solving the meteorological problem concerning the permanent circulation of the atmosphere at altitudes greater than 15,000 feet. It is said that the German government is to furnish Mr. Rotch with a ship equipped for a three months' voyage in the tropics. The necessary apparatus and expenses are to be paid for by American scientific men.

E. Tardy has studied the oil of Chinese anise, the oil of Japanese anise and the oil of fen'nel. He finds that Chinese anise oil contains pinene, phellandrene, estragol, a dextrogyrate terpenol, anethol, a levogyrate sesquiterpene, anisic aldehyde and acid, together with traces of a crystalline body of the formula C₂₀H₃₂O₂, and of the ethyl ether of hydroquinone. The author attaches some importance to the presence of the terpenol, to which he considers the particular odor of Chinese anise is due. The result of his study of Japanese anise (*Illicium religiosum*) shows that the oil has a low rotation.

Princeton University recently received from John M. Clarke, New York State palæontologist, the body of an octopus-like creature, from Onondaga Lake. Dr. Ortmann examined the specimen and found it to be a cold-water, short-armed squid, a species of devil-fish prevalent along the Atlantic coast from Cape Cod to Newfoundland. The fish was a salt-water specimen, and how it came to be found in fresh water is not easily explained. To be sure, the specimen examined by Dr. Ortmann differs from the ocean-bred squid in that it has not the delicate membranous folds on the arms that stretch out from its body. It may be that these folds constitute a real variation, but Dr. Ortmann is inclined to believe that the membranes have been lost through abrasions or imperfect preservation. In every other respect the New York squid resembles the ocean kind.

The Stanford University has received curios gathered by Mrs. Stanford during her long sojourn in Egypt. The collection is interesting, not because it contains many specimens of ancient Egyptian art, but because of its modern historic value. One of the most precious *trouvailles* of the collection is a set of volumes recounting the history of the occupation of the Nile country by the French, and producing in colors the discoveries and conquests of Napoleon. The volumes were compiled by Napoleon's orders in 1812. A set of fine reprints in from twelve to eighteen colors of originals dealing with recent discoveries in the ruins of Karnak, also constitute an important part of the collection. Besides these there are cases of gold embroideries, the work of the women of a great harem in Cairo; large numbers of ancient coins, vases and lamps, statuettes, and bas-reliefs of pottery.

The appetite of a whale is phenomenal. His chief diet consists of jellyfish. He has simply to open his mouth and paddle along leisurely in order to take in jellyfish by the wagon-load. Such is the method adopted by the whalebone whale. The sperm whale, on the contrary, captures huge squids weighing often several tons. Like his brother the whalebone whale, he must be constantly on the lookout for food. Otherwise he would starve. As many as fourteen seals have been taken from a thirty-foot "killer." Other fishes of enormous appetites are not uncommon. The bluefish, for example, thrives on sardines and other small fish. Assuming that one bluefish eats ten small fish a day, it has been figured that it requires ten thousand million sardines to feed the one thousand billion bluefish on our coasts every summer. Most curious of all eaters is the hydra—a strange creature that can be turned inside out without impairing its appetite or its power to eat.

THE CURRENT SUPPLEMENT.

The current SUPPLEMENT, No. 1412, opens with an elaborately-illustrated article on the steam yacht "Aztec." Dr. Marcus Benjamin has made an abstract of some of the more important scientific papers presented before the Washington meeting of the American Association for the Advancement of Science. The English correspondent of the SCIENTIFIC AMERICAN discusses, in the fifth installment of his series on water-tube boilers, the well-known and widely used Niclausse boiler. John Joseph Flather sets forth modern tendencies in the utilization of power. An account of the diversity of the uses of cold storage, by Day Allen Willey, should be read with interest. To exporters, Consul T. H. Norton's admirable summary of commercial conditions in Asiatic Turkey will be of value. The well-known manufacturing chemist W. J. Schieffelin discusses the advances made in pharmaceutical machinery and methods in the last half century. Fred T. Jane presents another installment on the naval war game. His present article tells how hits are determined. Automobileists will read with interest an account of the auto-chronograph, a new electric timing device for automobiles. The usual Consular Notes and Selected Formulæ will be found in their accustomed places.