As a result of this, there are several miles of these huge decaying masses around the various stations.

Until about thirty years ago, there were no rats on the islands. At that time a sealing vessel allowed a few rats to go ashore, and the result to-day is appalling in its enormity.

The conditions have been ideal for these rats—with their nests in the tangled bunches of tussock and peat, and with a constant supply of meat in all stages of decomposition and cold storage close at hand!

There are literally millions of these rodents working away at the carcasses and swarming along the well-traveled trail which they have made on the mountain slopes. Even when the winter snows cover the place, operations in this rat haven are not stopped.

It was stated at one of the whaling stations that the rats have devastated the few small animals living on the island, and, indeed, are a menace to the health and safety of the place.

It would be interesting to know what characteristics the rat would develop after a few years of such a specialized habitat.

I. A. LUKE

SCIENTIFIC BOOKS

Les Sciences Biologiques Appliquées à l'Agriculture et la Lutte Contre les Ennemis des Plantes aux États-Unis. By DR. PAUL MARCHAL. Extrait des Annales des Épiphyties Tome Troisième. Paris, Librairie Lhomme. 1916. Pp. 30–390.

It does not seem like four years since Dr. Marchal visited this country and traveled from east to west and north to south, visiting the field laboratories of the Bureau of Entomology and educational institutions, yet actually that trip was taken in the summer of 1913. His book, under the title (translated) "Biological Sciences Applied to Agriculture and the Struggle against the Enemies of Plants in the United States," was received in this country in November last, its publication having been delayed by the war, and it is even now printed only in a very small edition. It is a large royal octavo volume covering nearly four hundred pages, abundantly illustrated. Marchal has a remarkable mind. It is little less than marvelous that in two months and a half he should have grasped the whole field in so perfect a way as to be able to write a book which is especially illuminating to us who are in the middle of things and who can not get the perspective which he reached after he returned to France and collected and classified his notes and impressions. The larger part of the book is devoted to the Bureau of Entomology, pages 52 to 198 being given to this service. The rest of the Department of Agriculture is considered in the following 30 pages, and 20 more are given to the experiment stations, the state entomologists, the Horticultural Commission of California, and the forestry services of the different states. Then follow 40 pages on universities and agricultural colleges, especial space being given to Cornell University and the universities of Illinois, California, Stanford and Harvard. He is enthusiastic over the Association of Economic Entomologists. The remaining 100 pages of the book are devoted to chapters on insect carriers of disease, the methods employed in the struggle against the enemies of crops (this chapter being divided into cultural methods, biological methods and technical methods), the laws concerning the protection of plants, including the insecticide law, and a conclusion. In this conclusion, after praising in an unstinted way the establishments of this country and the work which has been done, he especially points out that, far from narrowing itself in applications of science, the United States holds a place of the first rank in creative science. He thinks that France has much to learn from America, although it would be a mistake in his country to create an organization imitating in all respects the Department of Agriculture at Washington. He shows that the economic and cultural conditions are quite different on the two continents and that certain questions which have prime importance here have only a secondary interest in France. He is inclined to think that the United States Department of Agriculture is rather over organized, and thinks that the future will bring about a

simplification of its constituent elements. The main lesson that he learned by his journey is that France can no longer remain stationary in these matters and that it should make efforts to organize biology as applied to agriculture upon a large and solid basis, and he proceeds with practical suggestions in this direction. He praises the Federal Horticultural Board, the Federal Insecticide Board, and the Horticultural Commission of California, and thinks that all of these should be imitated in France. He especially points out the necessity for the introduction into France of such education as our young men get in applied biology in the agricultural colleges and universities like Cornell and Illinois. There is, he points out, in France at the present time no way of getting a scientific education in biological studies as applied to agriculture.

After pointing out some of the great examples of monetary saving in this country as the result of work in applied biology, he closes with the sentence, "These are great examples which it is well to recall, for they establish with the most complete evidence the fact that there is no other sure way than that of scientific organization of work to get full value from the national soil and to give back to agriculture the greatest possible part of the riches which are lost to it annually from pests."

L. O. Howard

CONCERNING THE HISTORY OF FINGER-PRINTS

Sir William J. Herschel published recently a brief pamphlet of 41 pages under the title "The Origin of Finger-Printing" (Oxford University Press, 1916). This is mainly an autobiographical sketch, giving in detail the story of how the author during the time of his useful service in India (1853–78) conceived the notion of finger-prints and elaborated this system, which was subsequently developed and placed on a truly scientific basis by Sir Francis Galton. We are indebted to Sir W. Herschel for his interesting document: it is always valuable when one who has played a prominent rôle in inaugurating a new movement presents us with a record of what he believes was his share in bringing about this innovation or invention. The inventor, however, will seldom be able to write impartially the history of his own invention; no one, in fact, whether statesman, artist, poet or scholar, while recording his own history, has the faculty (I should even say, the right) of clearly determining his own place in the long chain of historical development. This judgment must be left to the historian of the future. The principal purpose by which Sir W. Herschel was guided in writing his account is to demonstrate that he was the real "discoverer" of finger-prints in Bengal in 1858, entirely from his own resources, and to discredit all other claims to priority in this matter, especially those on the part of the Chinese. I regret that the author has failed to take notice of the "History of the Finger-Print System" published by me in the Smithsonian Report for 1912 (pp. 631–652, Washington, 1913). Not only are Sir W. Herschel's great merits and his share in the history of the invention, if invention it may be called, duly acknowledged and objectively expounded there, but he would also have found there all the available evidence in favor of the Chinese, Japanese and Tibetans, all of whom applied ages ago with full consciousness the system of finger-prints for the purpose of identifying individuals. The few modern traces of evidence known to Sir W. Herschel are treated by him slightly, and he wonders that "a system so practically useful as this could have been known in the great lands of the East for generations past, without arresting the notice of western statesmen, merchants, travelers and students." The Mohammedan authors who visited China did not fail to describe this system. Rashid-eddin, the famous Persian historian, who wrote in 1303, reports as follows:

> When matters have passed the six boards of the Chinese, they are remitted to the Council of State, where they are discussed, and the decision is issued after being verified by the *khat angusht* or "finger-signature" of all who have a right to a voice in