

them for years, while all the races subjected to the process yielded a larger crop of better silk than before. So marked was this improvement that a comparison will show it at a glance. In the first report, already alluded to, made in 1885, Mr. Griffith's yield of cocoons — considered a splendid return at the time — was 78 kilogrammes (171 pounds avoirdupois) per ounce of eggs set to hatch, while in 1890 the harvest was 91 kilogrammes (200 pounds) per ounce of eggs. These figures have been vouched for by M. E. Charmand, chief of the Smyrna branch of the "Direction Générale de l'Administration de la Dette Publique Ottomane, à Constantinople," who reported his observations, gathered from time to time in Mr. Griffith's factory at Bournabat, to his superiors at the Turkish capital.

Following up these efforts, and stimulated by the ill-success of the French sericulturists, Mr. Griffith last year achieved an additional triumph, his latest crop showing an advance to 92 kilogrammes (202 pounds) of cocoons per ounce of eggs. This harvest had likewise been watched through all its stages, and reported upon to the Constantinople authorities by the same gentleman already named, who added that as the yield from foreign eggs had been *nil* at Bournabat, their importation into Turkey ought to be stopped.

It will be evident to the readers of the above and former communications that Mr. John Griffith's single-handed and almost phenomenal success in sericulture, in the face of the utter failure of the best silk-farmers of France, point to Bournabat as the future sericultural school of the world, and as the *entrepot* for robust graine. If further figures be required, they are to be found in the circumstance that during the last four or five years the finest French eggs hatched at Bournabat have only yielded from 10 to 12 kilogrammes (22 to 26 pounds) of cocoons per ounce, as compared with Mr. Griffith's 92 kilogrammes (202 pounds) per ounce of eggs; while last season, according to M. Charmand, the French eggs laid out at Bournabat did not hatch at all.

WILLIAM COCHRAN.

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MR. KOEBELE'S SECOND TRIP TO AUSTRALIA.¹

WE have not yet mentioned in these pages the fact that Mr. Koebele has been sent out to Australia and New Zealand a second time on a search for beneficial insects. The California State Legislature last winter appropriated \$5,000 for sending some one to Australia for this purpose, and this sum was placed at the disposal of the State Board of Horticulture. The board soon afterward made application to the Secretary of Agriculture to have Mr. Koebele sent, placing the entire appropriation at the secretary's disposal. To this proposition the secretary assented on condition that Mr. Koebele should go under instructions from the department, his salary as an agent of the division of entomology being continued (his expenses only to be paid by the State Board of Horticulture), and that his report should be made to the Department of Agriculture, the desire being to co-operate as far as possible with the board. Accordingly, such instructions were given as seemed best to promote the object in view, cautioning Mr. Koebele particularly to run no risk, in his sendings from Australia, of importing with the beneficial insects any injurious species not now existing in the United States which it might prove disastrous to introduce, and taking advantage of the occasion also to have him make every effort to collect

in California certain beneficial species to take with him to Australasia, indicating such species as prey upon cosmopolitan insects or species which the colonies mentioned have derived from America.

Mr. Koebele sailed on the August steamer, stopping at Honolulu and Auckland, and arriving at Sydney the latter part of October. At Honolulu he left a number of living specimens of *Chilocorus bivulnerus* in the hands of our correspondent, Mr. A. Jaeger, and secured while there four species of lady-birds, of which he sent small numbers to California by steamer. These were sent for use against the black scale (*Lecanium oleæ*). He also found a few parasitic Chalcididae on an undetermined *Lecanium*, and of these he also sent a few specimens. Upon his arrival in New Zealand some of the lady-birds which he had taken with him were alive and began to feed at once upon woolly aphis. Some syrphus flies and lace-wing flies were also in good condition, as were also the larvæ of the Rhabdidae, which feeds upon the codling moth. These were left in competent charge. Specimens of *Scymnus acceptus*, *S. consor*, *S. villosus*, *S. flavihirtus*, and *S. fagus* were collected and sent to California. These all prey upon various species of scale-insects, but it is hardly to be supposed that they will accomplish any better results in California than do our native species of this genus, all of which have a similar habit.

The most encouraging information comes to us under date of Nov. 1 from Sydney. He there finds that *Orcus chalybeus*, a steel-blue lady-bird, is a most important enemy of the red scale. He has found them by the hundreds, and has observed the mature insects eating the scales. All of the trees were "full of eggs," and the larvæ were swarming upon all the orange and lemon trees infested with the red scale. He secured and sent a large lot of the eggs and many of the adult beetles. He also sent the allied *Orcus australasiae*, also found feeding upon the red scale, and a number of scymnids, one of which was very numerous, feeding upon the same scale-insect. Another species was found feeding mainly upon the flat scale (*Lecanium hesperidum*) and the black scale (*Lecanium oleæ*). He also forwarded a number of *Leis conformis*, which, as stated in Bulletin No. 21 of this division, is the commonest enemy of the woolly root-louse of the apple. Unfortunately Mr. Koebele does not state whether the three insects mentioned as feeding upon the red scale were successful in holding that destructive insect in check, and upon this point naturally depends much of their value to California. Our agent at Los Angeles, Mr. D. W. Coquille, has been instructed to spare no pains to properly care for and colonize whatever may be received from Mr. Koebele, and is fully prepared to do so. This large sending arrived at Los Angeles, we are sorry to state, in rather bad condition. Twenty-eight beetles, however, were alive, including nine of *O. chalybeus*, and no effort will be spared to keep them in good condition and to induce them to propagate.

LETTERS TO THE EDITOR.

* * * Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

The First Locomotive.

I AM surprised that your correspondent, "M. H.," in his article in your issue of the 15th, "The First Locomotive Run in America," should have been so mistaken in its name. There is a small

¹ From Insect Life for December, issued by the U. S. Division of Entomology.