dollars which had to be raised as a condition of receiving this gift was very largely contributed by personal friends of his, as a token of the confidence and affection which he had inspired in them. He had the satisfaction before his death of seeing this fund completed.

Fine was one of the type of scholar developed before the days of extreme specialization. While he was familiar with the work that was being done by the other members of his department, and while he kept abreast of the general progress of mathematical science, he did not forget his earlier interest in the classics and philosophy. He was well read in general literature, and had an excellent style in writing. He had valuable and well-grounded opinions on all questions of university policy and of general education. He enjoyed the students' sports, and for nearly the whole of his professional career served on the university committee on athletics. In his early days he played well on the flute, and he had throughout his life an extensive knowledge and a fine critical judgment of music.

In all matters to which he gave his attention he was a clear thinker, a most persuasive though not a ready debater, and an excellent negotiator. If he had accepted the post of ambassador to Germany which was offered him by President Wilson he would have shown on a larger stage that he had the qualities of a great diplomat. In personal intercourse he was singularly genial and winning. His circle of friends, both old and new, was large and bound to him by sincere affection. He will be long mourned by those who loved him and have looked to him as an example of the highest type of scholar and teacher.

W. F. M.

PRINCETON UNIVERSITY

HARRISON GRAY DYAR

A MAN died in Washington on January 21 who was known personally to comparatively few scientific men although his work had made him famous in a growing field. Dr. Dyar was born in New York City, February 14, 1866. His father was a famous inventor, who is said to have disputed the priority of S. F. B. Morse's invention of the electric telegraph, and who undoubtedly made a fortune by inventions relating to dyes. Young Dyar was educated at the Roxbury Latin School, at the Massachusetts Institute of Technology and at Columbia University. He took his bachelor's degree at the Massachusetts Institute in 1889. In 1893 he returned and took the last year of its biology course, going the next summer to Woods Hole. He then went to Columbia University, gaining his A.M. in 1894 and his Ph.D. in 1895. In 1894 he published an important paper on the classification of Lepidopterous larvae, and in 1895, after research work in bacteriology, he published his thesis, which was entitled "On Certain Bacteria from the Area of New York City." This study pointed out certain things with regard to the supposed specificity of bacteria and their variability which were not in accordance with the general opinion of that time. Recent writers, however, have changed the general view and refer to this early paper of Dyar's with distinct approval.

His work on Lepidopterous larvae attracted the attention of entomologists, and, meeting him in 1897, the writer invited him to come to Washington. The invitation was accepted, and he became custodian of the collection of Lepidoptera in the U. S. National Museum, a position which he still held at his death. For a comparatively short period he was in charge of the whole of the insect collections of the museum.

When the attention of the world became turned to mosquitoes as the result of the discoveries concerning their disease-bearing function, he began to study mosquito larvae—at first because they were larvae and he had been studying intensely the larvae of another group of insects. Later he saw the importance of this stage to a thorough understanding of the Culicidae, and from this he became interested in everything about mosquitoes.

When the Carnegie Institution of Washington made its first grant to the present writer for the preparation of a monograph on the mosquitoes of North and Central America and the West Indies, Dyar was chosen to do the work on the larvae; Frederick Knab was later associated, and the two in collaboration are mainly responsible for the taxonomic portions of the extensive four-volume work on this subject published from 1912 to 1917 by the Carnegie Institution.

Dyar's financial means were such that he was not hampered in his work by salary necessities, and during the major part of his thirty-one years of life in Washington he received no compensation for his work, although for a few years he was on the rolls of the Bureau of Entomology of the Department of Agriculture. He was consequently able to take long field trips at his own expense, to investigate regions where field study was needed, and he thus became acquainted with local conditions over a vast extent of territory. He adopted in his taxonomic work the plan of introducing synoptic tables of the larvae and of the male genitalia as well as the other structural features of the adult, and thus brought about very largely a fixity of classification little known in many other groups.

In the years between 1917 and 1927 there was great activity over the world in mosquito study. New forms came to light, not only in the regions included in the

scope of the Carnegie monograph, but in South America and in other parts of the world. A mosquito taxonomist of great ability appeared in the British Museum of Natural History (F. W. Edwards) and, working largely with the Old World fauna, he arrived at conclusions coinciding in the main with those reached by Dyar. With the incoming of material from South America, and with the publication of the excellent "Monograph of the Mosquitoes of Surinam," by the Bonnes, the necessity for a supplemental volume to the Carnegie monograph became apparent. The interest of Dr. J. C. Merriam was enlisted and the consent of the trustees of the Carnegie Institution was gained for the preparation of a volume to include the mosquitoes of all the Americas. Dr. Dyar was a tireless worker, and by the close of 1928 he had completed the volume and had seen it published.

All these years he had been publishing shorter articles, both on mosquitoes and on Lepidoptera, and two as yet unpublished papers were left in completed form.

Thus has ended a life of intense scientific activity and one which undoubtedly has made important contributions to human knowledge.

L. O. HOWARD

U. S. DEPARTMENT OF AGRICULTURE

SCIENTIFIC EVENTS

THE BREEDING OF BENEFICIAL PARASITES

A LABORATORY for breeding beneficial parasites, established by the British Empire Marketing Board and under the control of the Imperial Bureau of Entomology, has now been at work for rather more than a year. According to a report in the *Journal* of the American Medical Association, consignments of insects have been sent out in response to requests from Canada, New Zealand, Australia, South Africa, Kenya, the Falkland Islands and different parts of England. Between 20,000 and 30,000 larvae of the pine tortrix, 90 per cent. infected with a parasite that attacks it in its larval stage, were recently collected (largely from Brandon, in Suffolk) for Ontario. Ontario also received 20,000 parasites of the greenhouse white fly, which was exported on whole tomato sprigs and sent over in cold storage. Adult parasites of a scale insect that attacks fruit were sent over in small sealed test tubes to Vancouver and provided with raisins for nourishment in transit. The wood wasp *Sirex* infests most timber-growing countries. Its larvae bore their way into tree trunks, leaving behind them neat circular tunnels in the wood. The *Sirex* parasite is another fly, *Rhyssa,* with a long ovipositor which it thrusts right through the grain of the wood until it penetrates the body of the wood wasp larva, on which it lays its egg. Three hundred and fifty of these *Rhyssa* larvae have been collected in Devon and shipped to the Cawthron Institute in New Zealand. Australia and New Zealand have also received 30,000 larvae of the pear-slug infected with three species of parasites, collected mainly from northern France. The sheep blow-fly, a big greenbottle, lays its eggs in dirty and matted wool on living sheep, and the maggots that hatch out eat their way into the animal's body. There is, however, a parasite which in turn lays its eggs in the blow-fly maggot and eventually kills it. Hundreds of thousands of these maggots, with their appropriate parasites, are being bred at the laboratories, and some have already been exported in the chrysalis stage to Australia, South Africa and the Falkland Islands, where the blow-fly causes enormous loss of sheep life. Other recent exports include parasites of the woolly aphis of the apple, sent to India and Kenya Colony, and of the earwig, sent to New Zealand and Canada. Three Australian scientific men from the commonwealth department of entomology are carrying out research at the laboratories under the superintendent, Dr. Thompson, who is himself a Canadian. One is working on the sheep maggot, or blow-fly, already mentioned; one on a parasite of the apple-ravaging codling-moth, and one on an insect that attacks a troublesome weed, Saint-John's-wort. Dr. Myers, of the Farnham Royal staff, has gone to the West Indies to deal with tropical parasites, and he will organize shipments of beneficial insects between the various islands and British Guiana.

MINERAL PRODUCTION OF THE UNITED STATES IN 1928

THE total value of mineral production in the United States in 1928 was approximately $5,400,000,000, as estimated by the United States Bureau of Mines, Department of Commerce. This is a decrease of approximately 2 per cent. of the total value of mineral products in 1927 and is due almost entirely to a decrease in the total value of mineral fuels. Of these, the quantity and value of coal decreased; the quantity of petroleum produced changed little, but the value decreased, and the quantity and value of natural gas and natural gasoline increased as compared with 1927. The total value of metallic products shows an increase due to increase in quantity and unit value of copper and an increase in the quantity of iron produced. Decreases were shown for gold, silver, lead and zinc. The total value of non-metallic mineral products shows approximately no change. Decreases for some of these products were offset by increases for others.

The following figures give the estimated total value of metallic mineral products and non-metallic mineral