countries and to many islands. The most extended of these are that carried out by Mr. Stewart in traversing the length of the Amazon River and that by Mr. Sligh in Asia Minor, Turkey, Arabia, Greece, Tripoli, Tunis and Algeria. The director of the department, on his way to meet the *Carnegie* at Colombo, made observations at Tau Island, of the Samoan Group, on the day of the total solar eclipse, April 28, 1911; and also at six other island stations in the course of his voyage.

The office work of computation and compilation of results and of the construction and testing of instruments has proceeded simultaneously with the operations on land and sea. A complete collection of the data obtained since the establishment of the department, including those of the cruises of the *Galilee* and *Carnegie,* will be ready for publication by the end of the present calendar year. Three portable magnetometers have been completed and four others are under construction, while various improvements to instruments and apparatus in use have been made, along with all current repairs, in the construction and repair shop of the department.

INVESTIGATIONS OF RESEARCH ASSOCIATES

Between fifty and sixty research associates have carried on investigations under the auspices of the institution during the year, either by aid of grants made directly to them or for the purpose of publishing results of their investigations. Several of these associates have been connected with the departments of investigation. Many collaborators have also participated in the researches carried on under this head, and the fields of investigation are numerous and of very diverse kinds. An idea of the extent and variety of this work can be best gained by consulting the reports, in the current Year Book, of the individual investigators, by reference to the annual list of publications of the institution and the general bibliography of the year. As indicating the diversity of these investigations, attention may be called to two remarkable publications in widely different fields. One of these is a treatise on dynamic meteorology and hydrography, by Professor V. Bjerknes, of the University of Christiania, and marks a noteworthy advance in this difficult branch of mathematical physics. Part I. of this work has been issued and Part II. is now in press. It is interesting to note, also, that permission has been given to a foreign publishing house to bring out an edition of this work in the German language. The other work referred to is entitled "The Polynesian Wanderings," by Mr. William Churchill. It attempts to trace the migrations of the Polynesians in the Pacific Ocean by means of a critical examination of the philological contents of their language. Mention may also be made in this connection of progress in the publication of the Classics of International Law, one work of which—namely, that of Richard Zouche—having been completed.

CHARLES X. DALTON

THE passing of Charles X. Dalton removes a personality familiar not only to a large circle of scientists throughout the country but to many of Boston's leading business men, with whom he had a large acquaintance owing to his association with that eminent optician, the late Robert B. Tolles.

Born in Philadelphia in 1840, Mr. Dalton learned his trade as an expert mechanician from a German instrument-maker of that city. In his early days he worked in the factory of Joseph Zentmeyer, the well-known microscope manufacturer, and during the Civil War, served as an army nurse. At the close of the war, he entered the employ of Tolles, and later (1867) was associated with him in the Boston Optical Works.

This enterprise, while never profitable financially, owing its existence for many years to the liberality and public spirit of a few wealthy citizens of this city, was epoch making for the industry, nevertheless; for the microscopes and small telescopes produced in its dingy shop attracted the attention of the whole scientific world and set standards not only for America, but Europe as well. To Mr. Dalton was entrusted the making of all the metal work which embodied the intricate designs of the great optician.

The freely spoken encomiums of the best instrument-makers of Europe attesting to the superiority of workmanship of the Tolles objectives have more than once made special mention of the excellence of their metal work. This Boston company was all too short lived, owing to the untimely death of Tolles in 1883, but many of Tolles's instruments, treasured to-day by connoisseurs as still unequalled, remain as fitting memorials of the genius of this master optician, and will also keep alive the memory of the clever mechanician whose deft workmanship contributed so much to their excellence.

For one or two decades preceding and immediately following the Civil War there was a widespread popular interest in the microscope among cultivated people as a form of amusement, although much serious scientific work was done likewise. Microscope clubs were common throughout the land, and in England as well. Many became experts in microscope technique and there was an active demand among the wealthier of these enthusiasts for the best instruments that could be produced, irrespective of cost. This stimulated the instrument-makers of England and America to use the utmost skill and best workmanship, and in the hands of famous opticians, among whom Tolles with his giant genius shone preeminent, the microscope was carried to a high degree of elaboration and efficiency. It was under such conditions that Charles Dalton was inspired to use his skill and cunning as an artificer of metals. Dalton was not a workman for wages only. He had that true love of his craft and a pride in his workmanship which characterized the true craftsman and which is vital for best results. He would never do mediocre work and was his own severest critic of his product. He made many of his tools and appliances and accomplished much by primitive but cunning methods which are a lost art to the mechanician of to-day, or made possible only by the use of elaborate tools.

The death of Tolles practically ended the work of the Boston Optical Co. A few instruments designed by Tolles were completed by his workmen, but no successor could be found to give adequate expression to the original genius of the master. For many years Mr. Dalton has carried on the business in the old Hanover Street building, making repairs on the Tolles instruments which have been sent to him as the only one competent to make them and doing a general business in the sale and repairs of optical and other delicate instruments.

The wane in popular interest in the microscope as a recreation for the dilettante and the cheap compact "continental" instrument, of high optical efficiency but reduced to the simplest terms as to finish and accessories, in short a laboratory tool designed solely for the special work at hand has become common in our schools and colleges. Such instruments of good quality are now turned out by the thousands by the great manufacturers, using labor-saving machinery and modern systems of divided labor, and a good microscope is cheaper to-day than formerly. The elaborate instruments of Tolles and other great opticians of the past generation, instruments in which cost was subordinated to every detail which added to convenience and efficiency, masterpieces of ingenious and perfect workmanship, are no longer made, and with them is disappearing the old-time workman whose knowledge and craft partook almost of the dignity of a profession.

No doubt this condition is quite in accord with modern ideas and economics, but there may be some who view the changing times with some regret, some who have known the spirit and moral fiber of the old craftsman

and rejoiced in the fruits of his workmanship. May be there are some who still feel that there is a dignity and fitness in studying the beautiful in science for its own sake even by the untrained, and take the microscope as more than a laboratory tool.

The originality and workmanship of these old instrument-makers are still felt and long will be felt in the industry. European microscopes which till comparatively recently have been of the most primitive types, are gradually changing in design by adoption of many of the original optical and instrumental features of Tolles and his contemporaries, bearing witness to the permanence and soundness of their work.

Mr. Dalton in his later years made most of the repairs on the microscopes and chemical balances of the Harvard Medical School, Massachusetts Institute of Technology, Wellesley College, and in fact of most of the educational institutions in and about the city, his work in this line occasionally taking him as far as Vassar.

Through this business, he had a wide circle of acquaintances and will be missed by many who have looked with pleasure on the coming of the genial little gentleman who with his clear complexion and bright eye looked seventy years young, a man whose scrupulous cleanliness of person but exemplified his own blameless character, a normal man and the highest type of American craftsman.

GEO. W. ROLFE

THE SECOND INTERNATIONAL CONGRESS OF ENTOMOLOGY

THE first International Congress of Entomology, held in Brussels on August 1–6, 1910, was an unqualified success. It was well supported by entomologists of all countries, both theoretical and practical, and also by many governments and institutions, which are at last beginning to realize the profound importance of this science in medicine and in agriculture. The membership was nearly 400, and upwards of 300 actually attended the proceedings. The results of the deliberations are being published in two volumes, the first being devoted to the proceedings and discussions, the second to the numerous memoirs contributed by many authorities upon a great variety of subjects, including papers devoted to pure and to economic entomology. The volume of memoirs (515 pages, 27 plates) is now published and issued to members. The volume of proceedings will follow shortly.

It was decided at the first congress that the second congress should be held in 1912, and the following meetings every three years from that date, so that in future the International Congress of Entomology will be held one year before the International Congress of Zoology. The second congress will therefore be held at Oxford on August 5 to 10, 1912, under the presidency of Professor E. B. Poulton, D.Sc., F.R.S. A reception committee has been formed, consisting of:

Dr. F. A. Dixey, F.R.S. (Chairman).

Professor G. C. Bourne, F.R.S. (Professor of Zoology).

Professor H. L. Bowman, D.Sc. (Secretary to the Delegates of the University Museum).

Professor E. B. Poulton, D.Sc., F.R.S. (President of the Second Congress).

Geoffrey W. Smith, M.A. (Fellow of New College).

Commander J. J. Walker, M.A. (Secretary of the Entomological Society of London).

H. Eltringham, M.A. (Cant.), M.A. (Oxon.), and G. H. Grosvenor, M.A. (Secretaries).

It is hoped that the reception committee will be able to arrange for members of the congress to have rooms in the colleges at a moderate price, but this privilege will be available for gentlemen only. In order to facilitate the arrangements, it is requested that ladies and gentlemen who propose to join and attend the Congress send in their names as early as possible to the general secretary of the executive committee, who will be happy to give any further information. Ordinary members who pay £1 (25 francs) will receive all publications of the congress. Ladies and children accompanying members will, on payment of 10s. (frs. 12.50) each, have all privileges of members except that of receiving the publications. Life members who pay a com-