

perspiration, a more rapid pulse, enlargement of the liver, anæmia, and perhaps a rise of body temperature. Hygiene, as is shown by statistics, is effective in reducing the death rate, and thus in making life possible for white men in the tropics. While a strong person may, with proper care, live nearly anywhere in the tropics, he does not become independent of the tropical climate. Accordingly, authorities agree, with only a very few exceptions, that true acclimatization of the white man in the tropics is impossible.

J. M. BOUTWELL,
Recording Secretary.

ACADEMY OF NATURAL SCIENCES, OF PHILADELPHIA.

January 24, 1899. MR. WITMER STONE made a communication on the Academy's collection of birds and its history. He quoted from Selater to the effect that in 1852 the collection was the largest in existence. The work of American ornithologists from Alexander Wilson to those of our own time, most of whom had been more or less intimately associated with the Academy, was commented on and two of Wilson's types were exhibited. They were the only ones known to the speaker to be in existence, all the others having apparently been lost on the breaking up of Peale's Museum, of which they formed part. After commenting on the growth of the collection, Mr. Stone spoke of the modes of preservation and exhibition, dwelling on the advantage of keeping the bulk of the specimens as flattened skins in air-tight drawers. Fine specimens of recent taxidermic work were exhibited and contrasted with the 'stuffed' birds of half a century ago. The communication formed a most interesting contribution to the history of the Academy and will make part of the first number of the *Proceedings* for 1899.

A paper entitled 'Contributions to the Life-History of Plants, No. XIII.,' by Thomas Meehan, was presented for publication.

January 31. PROFESSOR HENRY A. PILSBRY called attention to a small collection of shells from New Mexico and Arizona, received from Mr. Ashmun, whose zeal as a collector had increased the number of species of the region

from about a dozen to over one hundred. The snails are almost entirely confined to the mountains and they exhibit the characters of forms from archipelagoes, only one species of a genus being found on one mountain range. Six species of *Pupa* were from six distinct localities.

DR. P. P. CALVERT commented on the influence of the heat of the room in hastening the development of dragon-flies from nymphæ.

A paper entitled 'A List of Fishes collected at Port Antonio, Jamaica,' by Henry M. Fowler, was presented for publication.

February 7. MESSRS. GEORGE and WILLIAM S. VAUX, JR., made a communication on the Illecillewaet and Asulkan Glaciers of British Columbia. After Mr. George Vaux, Jr., had exhibited a large number of beautiful lantern views of the region, illustrating the distribution of peaks, glaciers and ranges, Mr. William S. Vaux, Jr., read a paper, which was afterwards presented for publication, describing in detail their investigations undertaken to determine the rate of recession of the two glaciers specially under consideration. The paper was also satisfactorily illustrated.

A paper entitled 'A New American Land-Shell,' by Edward G. Vanatta, was presented for publication.

February 14. DR. P. P. CALVERT called attention to the new catalogue of the dragon-flies of New Jersey, the section of the general catalogue of insects of that State confided to him by Professor J. B. Smith. The number of species of these insects has increased since the issue of the first catalogue in 1890 from 39 to 85. Middle-southern New Jersey has been touched but slightly and there is no doubt that other species will be added to the list.

EDW. J. NOLAN,
Recording Secretary.

NOTES ON PHYSICS.

THE MEASUREMENT OF INDUCTANCE.

OF the various electrical measurements which serve in the electrical testing laboratory, the measurement of the inductance (the exact electrical analogue of the moment of inertia of a rotating wheel) of a coil of wire is perhaps the most unsatisfactory. Mr. H. Martienssen (*Wiedemann's Annalen*, 1899, No. 1) has im-

proved the little known method of Puluj for measuring inductance by means of alternating currents. The method of Puluj was devised independently by Professor S. T. Moreland and reported to Section B at the Boston meeting of the American Association. The method, in its simplest form, is to connect two circuits in parallel between alternating current mains and adjust non-inductive resistances until the currents in the two branches are in phase, when the inductances in the two branches are directly as the resistances. To show when the currents are in phase an instrument called a *phase indicator* is used. This instrument is essentially a small induction motor without iron. It consists of two small coils with their planes vertical and at right angles to each other, surrounding a suspended aluminum or copper rod. These coils are connected, one in each circuit, and when the two currents are not in phase with each other the suspended rod is deflected. Martienssen modifies the instrument by winding one coil with two strands of wire, each strand being provided with separate terminals. One of these strands he connects in circuit as before, and the other constitutes a secondary coil in which a current is induced by the current in the primary strand. This induced current is sensibly in quadrature with the primary current, and by the use of an adjustable non-inductive resistance in this secondary circuit the instrument may be used, according to Martienssen, for the accurate measurement of much smaller inductions.

Puluj's method, as modified by Martienssen, is a zero method; it requires only a single adjustment; it does not require harmonic electromotive force, nor does the frequency of the e. m. f. need to be known; and it gives accurate results for inductances ranging from a few hundreds to many millions of centimeters. In short, we seem to have at last a feasible laboratory method for the accurate measurement of inductance.

W. S. F.

NOTES ON INORGANIC CHEMISTRY.

AN interesting discussion has been carried on during the last few years as to the constitution of inorganic compounds, especially of the

metal-ammonium bases, by Professor S. M. Jörgensen, of Copenhagen, and Professor Alfred Werner, of Zurich. Professor Jörgensen, to whom we owe so much of our knowledge of these bases, especially those of cobalt, chromium and rhodium, defends the constitution based on the present ideas of valence, which has been developed in its application to these compounds largely by himself on the basis furnished by Blomstrand. Professor Werner, feeling the insufficiency of the theories of valence to account for most of our complex inorganic compounds, has proposed a new theory of coordinated groupings, in which he seeks to account for the constitution not merely of the metal-ammonium bases, but also of all the complex inorganic compounds, including those containing water of crystallization. The last number of the *Zeitschrift für anorganische Chemie* contains the eleventh paper by Jörgensen and the fifteenth paper by Werner. In the former Jörgensen reviews Werner's theory, replies to all the objections Werner has raised to the valence theory as applied to the metal-ammonium compounds, shows the insufficiency of Werner's theory, and finally, by an ingenious piece of chemical logic, shows that Werner's own theory must, if consistently carried out, lead him to Jörgensen's own formulæ for these compounds. In this paper, and that of Reizenstein, recently mentioned in this column, one may get a good view of the arguments on both sides of the controversy.

WERNER's paper in the same number of the *Zeitschrift* is confined to a study of the application of his theory to the double chlorids. He has tabulated all the double chlorids from the whole field of chemical literature, and grouped them in types according to his theory, considering also the water of crystallization present.

It is yet too soon for any final judgment to be pronounced on Werner's theory, especially because the field to which it applies is so immense. The limitations of the valence theory are, however, only too keenly felt by chemists, and Werner's work is leading in the right direction. At all events, this lengthy controversy is productive of much good. It has turned the