The original use of the name as a class designation in contradistinction from Reptilia has not been noticed, however. Baur only traced it back to 1822. It will interest herpetologists, therefore, to learn that it was formally used as early as 1806.

In 1806 Latreille published the first volume of his work entitled " Genera Crustaceorum et Insectorum " and in his introduction (I., p. 2–3) enumerated the twelve classes of the animal kingdom then recognized by him.[5] The third and fourth classes were vertebrates with a single ventricle (" cor uniloculare, sanguine frigido "), the third class (" Classis III*. Reptilia, Reptiles ") having lungs only (" pulmones ") and the fourth class (" Classis IV*. Amphibia, Amphibies ") having both lungs and gills (" pulmones et branchiæ ").

Of course these definitions do not represent modern ideas of the 'really distinctive characters of the classes in question, but neither does any old definition of any class embody modern concepts of the group intended to be diagnosed.

THEO. GILL

SOCIETIES AND ACADEMIES

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE 681st meeting was held on May 21, 1910, President Woodward in the chair. Two papers were read.

Methods of Measuring the Modulus of Bending of Flat Metal Springs: Dr. R. S. WOODWARD, of the Carnegie Institution of Washington.

This paper explained three methods for measuring the modulus in question. The first two methods assume that the spring is clamped horizontally and rigidly at one end and permitted to assume the shape due to its own weight. This shape is defined by the following differential equation:

$$d^2\psi/d\sigma^2 \mp - a\sigma \cos \psi,$$

wherein ψ is the inclination of the neutral surface of the spring at any point, σ is the quotient of the distance of this point from the free end of the spring by its whole length, and a is a number

[5] In 1804 Latreille adopted the classification of Brongniart (1799) in which the amphibians were ranked as an order of reptiles (" Ordre IV., Batraciens, Batrachii ").

involving the modulus desired. The paper shows how to integrate this equation so as to give ψ, $\cos \psi$ and $\sin \psi$ simultaneously in power series of σ, and hence how to get the coordinates of any point in the elastic curve. When the latter are observed for the free end of the spring two equations result from which a and hence the modulus of bending may be found. Another equation from which a may be found results from equating the internal work of bending the spring to the external work done by gravity on the spring.

The third method of finding this modulus requires the application of a simple device which will bend a spring into a circular curve. The modulus of bending is then equal to the product of the applied bending moment by the radius of this curve.

Solar Radiation Intensities at Washington, D. C.: Professor HERBERT H. KIMBALL, of the U. S. Weather Bureau.

The results given are based on more than 7,350 separate determinations of the intensity of solar radiation made by the author at the Central Office of the Weather Bureau with an Angström pyrheliometer during the five years ending April 30, 1910. The observations were distributed over 272 half-day periods, or rather more than one half day to each week, and the radiation intensities are expressed in gram calories per minute per square centimeter of normal surface according to the Angström standard of pyrheliometry.

The maximum and the mean rates of radiation with a sky free from clouds were determined hourly or half hourly for a day in each month with average declination of the sun for the month. From these rates the daily and the monthly totals received on a surface normal to the solar rays, and also on a horizontal surface, were determined, first, on the supposition that the sky was free from clouds, and second, by taking account of the recorded duration of sunshine.

The maximum observed intensity of solar radiation, 1.44 calories, occurred in April, and the maximum for December, 1.32 calories, is only 8 per cent. less. The greatest monthly noon average, 1.28, occurs in February and the December average, 1.15, is only 10 per cent. less. The greatest daily total of radiation received on a normal surface, 971 calories, occurs in July, the corresponding December total being 60 per cent. as great. The greatest daily total for a horizontal surface, 653 calories, also occurs in July, and the corresponding total for December is only 30 per cent. as great.

The totals recorded by a Callendar horizontal pyrheliometer are very considerably in excess of the totals obtained from the Angström, the differences varying with the atmospheric conditions.

A diagram was presented showing variations in annual averages of radiation intensities at several stations, including Washington, and it was shown that a synchronism exists between minima of radiation intensities, minima of monthly mean temperatures in the interior of continents, minima of sky polarization when measured at the point of maxima, and maxima of distance of the neutral points of Arago and Babinet from the anti-solar point and the sun respectively.

(The abstracts of the foregoing papers are by their authors.)   R. L. FARIS,
Secretary

THE CHEMICAL SOCIETY OF WASHINGTON

THE 199th meeting was held at the Public Library on Thursday, May 12, at 8 P.M., with President Failyer presiding. The following papers were read:

The Exact Determination of Sulphur and of Barium in the Presence of Alkali Salts: I. K. PHELPS.

By precipitating with $BaCl_2$ in a hot, neutral solution the contamination of $BaSO_4$ with foreign negative ions may be almost completely avoided and the precipitate contaminated with such positive ions as K, Na or NH_4 converted into pure $BaSO_4$ by treatment with H_2SO_4, evaporation and extraction of the alkali sulphate with water. In determining sulphur this alkali sulphate is converted into $BaSO_4$ by addition of the water extract to the mother liquor of the first precipitate. This second precipitate of $BaSO_4$ is added to the first and the process repeated. In determining Ba the water extracts are rejected.

The Determination of Nitrogen in the Fæces: I. K. PHELPS.

The difficulties of loss of nitrogen by standing, of obtaining a uniform sample of the heterogeneous material, and of separating the hair from the fæcal matter when dogs are the subjects of study are overcome by preservation of the fæces under alcohol, filtration, dehydration of the solid material with ether and treatment of the solid residue and alcohol-ether filtrate separately. The solid residue is freed from hair by sifting and N determined in the usual way. The alcohol-ether filtrate is sampled and the N determined according to Kjeldahl, using the precaution to allow the alcohol-ether mixture to flow from a dropping funnel into the sulphuric acid heated and maintained at a temperature of 140–160°. Thus the large mass of the alcohol is converted into ethyl ether and excessive carbonization avoided and, at the same time, the acid kept of such concentration that all volatile nitrogen substances are held.

Oil Cement Concrete: A. S. CUSHMAN.

The results obtained in a series of experiments in which oil residuums of an asphaltic and semi-asphaltic nature have been mingled with cement concretes while in a still wet or plastic condition were described. No difficulty has been experienced in getting homogeneous mixtures, and the initial and ultimate strength of the oil concrete appears to be only slightly less than that of ordinary concrete. It is hoped that the results of the investigation will lead to some valuable practical uses of this material, both for road surfacing and for waterproofing concrete in general.

The Complexity of the Humus Extract of Soils: E. C. SHOREY.

This was a summary of the work of the Division of Fertility Investigations of the Bureau of Soils on soil organic matter. The author announced the isolation by him of twenty-three organic compounds from soils. Seventeen of these have been identified and eight types of compounds are represented.

The Separation and Determination of Cadmium in the Presence of Copper: E. A. HILL.

The use of filter paper pulp, pulped with an egg beater, is suggested for use in qualitative analysis for preventing the passages of finely divided precipitates through the filter and facilitating their removal therefrom.

In the solution of precipitates upon the filter the passage of the solvent is arrested by plugging the outlet of the funnel with a cork stopper, thereby giving the solvent time to act.

Cadmium carbonate is precipitated from solutions of copper by using ammonia free as distinguished from the ordinary laboratory $(NH_4)_2CO_3$ reagent in the former of which $CdCO_3$ is practically insoluble. The separation is delicate and complete (if heated) and affords a basis for both qualitative and quantitative methods which will be worked out later.

Arrangements were made to hold a special meeting at the Johns Hopkins University, to be followed by a smoker.

         J. A. LE CLERC,
Secretary