together and fitting the various forms into the single uniform environment where they now occur.

Again take the case of the flying squirrels (*Glaucomys*, etc.): presumably they arose in a region where there were many arboreal squirrels, descendent from those which did the most jumping, rather than isolated, and as a response to some peculiar environment which made it imperative for squirrels to fly.

J. T. NICHOLS

THE AMERICAN MUSEUM
OF NATURAL HISTORY

WEIGHT AND HUMIDITY

THE article entitled "Weight and Temperature" by Dr. P. G. Nutting, which appeared in SCIENCE of December 30, 1927, states that "a consistent difference of 1.2 mg. was found" between the weight of a lump of gold and the weight of the same lump after it had been rolled into a sheet, and that this difference was "probably due to adsorbed moisture." As there is considerable lack of agreement[1] in the literature regarding the influence of humidity upon weight, it seems desirable to publish the results of an investigation conducted some time ago on this subject.

Since the density of water vapor is less than that of air the hygroscopic condition of the atmosphere may be ascertained by comparing its density with that of dry air. If, therefore, a bulb containing dry air which is in communication with an open vessel containing the drying agent is counterpoised by a pointer, after the fashion of a micro-balance, it is possible to arrange the period of the instrument so that ample sensitiveness for hygrometric work may be assured. This method was tried, using a glass bulb. It was found, however, that the deflections of the instrument were much greater for certain changes in humidity than had been anticipated. An investigation was therefore started to determine whether or not the effect was due to the adsorption of water vapor. The materials used were glass, aluminium, hard rubber, bakelite and quartz. The glass was in the form of a bulb of surface area about 200 sq. cm., the aluminium, hard rubber and bakelite were in sheets of approximately 500 sq. cm. surface, while for the quartz a cup of surface area about 300 sq. cm. was used.

The object to be investigated was placed on the scale-pan of a highly sensitive Becker balance and counterpoised with standard weights. Inside of the balance case were placed two thermometers and two flat dishes which were filled with sulphuric acid of the proper density to assure certain relative humidities inside the balance case. Readings were taken every morning and the acid changed each time. Thus the weight of the object could be determined at relative humidities varying from 10 per cent. to 90 per cent. Care was taken to keep the temperature constant, and the balance was never allowed to oscillate nor was it ever disturbed in any way in the course of the investigation.

It was found that the glass bulb adsorbed 0.5 mg. after having been washed in boiling water and dried over a flame for one hour and 2.3 mg. after having been washed and then dried in air.[2] The quartz cup gained in excess of 1 mg. The gain in weight of the aluminium was about half as much per square centimeter as for quartz. Hard rubber and bakelite were found to be immensely more hygroscopic than these. *But in all cases the amount of water vapor adsorbed varied with the humidity.* Furthermore it was found that the water vapor is adsorbed much more quickly than it is given up. A dry object will adsorb its definite amount of water vapor in an atmosphere of a definite relative humidity in less than two hours; this same object may require a day to lose its water vapor if placed near concentrated sulphuric acid. It was obvious, then, that due to the adsorption of water vapor and this "hysteresis" effect neither the hygrometer mentioned above nor one based on the hygroscopicity of materials is feasible. A successful, continuously indicating, density-difference hygrometer which avoids these disturbing effects was later constructed.[3]

In conclusion we may say that the apparent weight of an object of relatively large surface varies appreciably with humidity and that this fact, as well as the "hysteresis" effect mentioned, should be taken into account in accurate weighings.

ARNOLD ROMBERG
L. W. BLAU

PHYSICAL LABORATORY,
UNIVERSITY OF TEXAS

[1] (a) Warburg and Ihmori, *Ann.*, 27, p. 481, 1886. (b) Trouton, *Proc. Roy. Soc.*, A, 79, p. 383. (c) Kuhn, *Deutsche Chemikerzeitung*, 34, p. 1097, 1910. (d) Scheringa, *Pharm. Weekblad*, 56, p. 94, 1919. (e) Metzger, *Glueckauf*, 60, pp. 39–44, 54–60, 94–97, 112–116, 1924.

[2] *Loc.* 1 (a).

[3] *J. Opt. Soc. Am. & Rev. Sc. Instr.*, 13, p. 717, 1926.

LEPIDOPTERA OF NEW YORK

To users of the "List of the Insects of New York" (Cornell Memoir 101): I much regret that in the circumstances of the compilation of the Lepidoptera records of this list it was not possible to publish many of the authorities for collection or determination of the material gathered before 1916. These data are preserved, however, in our files at Cornell University.

I also regret, although I can not accept personal blame for them, many obscurities in the credits for records received later, and some errors, resulting from the innumerable changes made in the editorial office of the New York State College of Agriculture. They were made in violation of a definite agreement, and they refused to rectify them in proof. I may say that the proof of the "Lepidoptera of New York" (Memoir 68) had received similar treatment, and that the agreement was made in that connection and reiterated in later letters.

Wm. T. M. Forbes

Cornell University

THE EASTLAND HORNED "TOAD"

Much attention has been attracted recently to a Horned "Toad" (*Phrynosoma cornutum*) which is alleged to have been placed in the corner stone of the Eastland County courthouse, Eastland, Texas, in the year 1897. The animal, it is claimed, remained entombed in the granite corner stone until February 18, 1928, a period of thirty-one years. On the latter date it is said to have been removed from the stone alive, before a large crowd of spectators which had gathered for the occasion.

On February 22, 1928, the writer had the opportunity to go to Eastland and make an examination of the external features of the animal in question. It appeared to be a perfectly normal specimen which had undergone winter hibernation. It was probably an old one for the horns about the head region were considerably worn and the right hind leg had been broken but was healed. Otherwise it appeared no different from a normal Horned "Toad" at this season of the year.

Willis G. Hewatt

Texas Christian University

THE BRASSO FOSSILIFEROUS MIOCENE OF TRINIDAD, WEST INDIES

To avoid any possible future confusion, it seems well to note that the Brasso Miocene clay and Brasso conglomerate described by Mr. Gerald Waring, in his Geology of Trinidad, Johns Hopkins Studies in Geology No. 7, pages 69, 71, and Legend of Map, 1926, are entirely distinct from the fossiliferous Brasso Miocene of my report, Miocene of Trinidad, *Bulletin of American Paleontology,* No. 42, pages 10, 16, 1925. The black clays and conglomerates mentioned by Mr. Waring *underlie* the Manzanilla formation. The fossiliferous beds, typical at Brasso Junction, mentioned in my memoir, *overlie* the Manzanilla, and carry a fauna of Middle Miocene Age, related to the Gurabo and Bowden faunas.

Carlotta J. Maury

Yonkers, N. Y.

SCIENTIFIC BOOKS

THE CEPHALASPIDAE

Paleontologists the world over may justly feel a thrill of pride that one of their number, Erik A:son Stensiö:, has produced such a splendid publication containing important, new and much needed information on the earliest known vertebrates, those curious mailed Silurian and Devonian chordates, which we have been calling Ostracoderms.[1] The most striking feature is the abundance of data, mostly new, on the nervous and vascular systems, the special sense organs, the finer anatomy of the skeleton, and suggestions as to habits of life. After examining the work one feels that he has been studying a treatise on modern fishes. The author has combined with the usual paleontological methods, those of the anatomical laboratory. His needle dissections under a binocular, the object immersed in a non-refracting medium; his use of the wax-plate method of serial section, invented by Sollas for fossils, his painstaking correlations with refractory material, form welcome and highly useful methods in Paleontology.

Following the first expedition fitted out by Prince Albert I, of Monaco, in 1906, there have been eleven expeditions to Spitsbergen up to 1925. The remains of the Cephalaspidae studied by Stensiö:, 105 specimens in all, were assembled from the collections of these Norwegian expeditions. This forms one of the most important discoveries of fossil vertebrates ever made.

The historical account, covering sixteen pages, itself an undertaking of no small magnitude, reviews the published accounts of the geological occurrence, taxonomy and anatomy of forms known. This is followed by a discussion of the anatomy of the Spitsbergen species; 205 pages being devoted to this phase of the work. Description of the genera and species occupies fifty-one pages. There are five genera, four of which are new, and twenty-four species, *all* new. A brief discussion of the Tremataspidae, and the general relations of other groups of primitive chordates to the *Cephalaspidae,* concludes the text. A reasonable bibliography of ten pages makes no pretense at completeness, but the interested student can safely use these references as a guide to the field. Personally, I should like the references given to be more exact, and to refer specifically to the part of the work which discusses the Cephalaspidae. It would lighten the labor of future workers. The second volume of

[1] "The Downtonian and Devonian Vertebrates of Spitsbergen." Two volumes octavo, pp. 1–391, 1 map, 103 text-figures, 112 plates. Det Norske Videnskaps-Akademi I Oslo. Resultater av de Norske Statsunderstøttede Spitsbergenekspeditioner. Nr. 12, 1927.