Zoologically the tendency is healthy. For the student's time will be set free to investigate collections of specimens from other standpoints than that of assigning each its name, animated by the desire to produce the longest possible list. Variations in a form will be studied as modifications adapted to particular environments. In museums the specimens can then be arranged, not as objects with so many long names as appendages, but as illustrating vital principles of natural history.

J. E. DUERDEN.

JOHNS HOPKINS UNIVERSITY,
BALTIMORE, MD.

GENERAL.

A NEW edition of Stieler's Handatlas to contain 100 copper-plate maps is now in course of publication by Perthes of Gotha, in fifty parts; the price of the complete work being 30 Marks. Half the maps are newly projected and engraved. All of them have relief in brown, in order to make the names in black more legible. In preparation for binding, each sheet has its title printed on the right corner of the back, with on outline map that indicates the location of the sheet and of the neighboring sheets with their numbers. The present edition is the ninth of this valuable work; the first having been completed by Stieler in 1831. Later editions were by Stülpnagel. Petermann, Berghaus and Vogel.

SCIENTIFIC JOURNALS AND ARTICLES.

THE January (opening) number of Vol. III. of the *Transactions of the American Mathematical Society* contains the following papers: 'On a Class of Automorphic Functions,' by J. I. Hutchinson; 'Concerning the Existence of Surfaces Capable of Conformal Representation upon the Plane in such a Manner that Geodetic Lines are Represented by a Prescribed System of Curves,' by H. F. Stecker; 'Zur Erklärung du Bogenlänge und des Inhaltes einer krummen Fläche,' by O. Stolz; 'The Groups of Steiner in Problems of Contact,' by L. E. Dickson; 'Quaternion Space,' by A. S. Hathaway; 'Reciprocal Systems of Linear Differential Equations,' by E. J. Wilczynski; 'On the Invariants of Quadratic Differential Forms,' by C. N. Haskins; 'The Second Variation of a Definite Integral when One End-point is Variable,' by G. A. Bliss; 'On the Nature and Use of the Functions Employed in the Recognition of Quadratic Residues,' by E. McClintock; 'A Determination of the Number of Real and Imaginary Roots of the Hypergeometric Series,' by E. B. Van Vleck; 'On the Projective Axioms of Geometry,' by E. H. Moore.

THE December number (Vol. VIII., No. 3) of the *Bulletin of the American Mathematical Society* contains the following articles: 'The October Meeting of the American Mathematical Society,' by Edward Kasner; 'Modern Methods of Treating Dynamical Problems and in Particular the Problem of Three Bodies,' by E. W. Brown; 'The Hamburg Meeting of the Deutsche Mathematiker-Vereinigung,' by C. M. Mason; 'Some Curious Properties of Conics Touching the Line Infinity at One of the Circular Points,' by E. V. Huntington and J. K. Whittemore; 'Picard's Traité d'Analyse,' by Professor Maxime Bôcher; 'Errata,' 'Notes' and 'New Publications.' The January number of the *Bulletin* contains: 'Note on Mr. George Peirce's Approximate Construction for π,' by Emile Lemoine; 'Concerning the Elliptic $\wp(g_2, g_3, z)$-Functions as Coordinates in a Line Complex, and Certain Related Theorems,' by H. F. Stecker; 'On the Abelian Groups, which are Conformal with Non-Abelian Groups,' by G. A. Miller; 'The Infinitesimal Generators of Certain Parameter Groups,' by S. E. Slocum; 'Shorter Notices'; 'Notes' and 'New Publications.'

SOCIETIES AND ACADEMIES.

CHEMICAL SOCIETY OF WASHINGTON.

THE 130th regular meeting was held December 12. The following program was presented:

'The Solubility of Mixtures of Sodium Chloride and Sodium Sulphate': A. SEIDELL.

The author first gave a brief summary of the status of solubility work in solutions other than very dilute ones, and described in detail the experimental difficulties which have to be met in this kind of work. He then presented

a diagram illustrating the solubility curves for the system $NaCl—Na_2SO_4—H_2O$ at 10°, 21.5°, 25°, 27°, 30°, 33° and 35°. It was shown that at temperatures above 33° the curves represented equilibrium conditions between sodium chloride and anhydrous sodium sulphate, and no abnormalities presented themselves. Between 33° and 17°, however, it was found that in solutions containing but small amounts of sodium chloride and in contact with solid sodium sulphate, the equilibrium conditions were determined by the solid salt being in the form of the decahydrate, and the solubility curves for this decahydrate are very much flatter than the corresponding curves for the anhydrous salt. But as the amount of sodium chloride in the solution increased, at temperatures between 33° and 17°, there was always a sudden change in the direction of the solubility curve for sodium sulphate, which was found to be caused by the sodium sulphate present as solid phase, having gone over to the anhydrous form. In order to check this view, the experiment was made of placing large well-formed crystals of sodium sulphate decahydrate in two test-tubes, one containing a saturated solution of sodium sulphate alone, and the other a solution nearly saturated with sodium chloride, as well as sodium sulphate. Both test-tubes were fitted with cork stoppers carrying thermometers. They were then immersed in a water-bath and the temperature gradually raised. At 28° the crystals in the sodium chloride solution gradually became opalescent around the edges, then rather rapidly became entirely opaque and showed a tendency to fall apart in a loose powder. The material had undoubtedly gone over to the anhydrous salt, although the crystals which were in the tube containing only water and sodium sulphate showed no change until the temperature reached 33°. It thus appeared that the transition temperature for the change of sodium sulphate decahydrate to anhydrous salt had been displaced by the presence of sodium chloride. This was regarded as of considerable significance, and is important in connection with the suggestions on this subject in the study of the change of gypsum to calcium sulphate hemihydrate, made by Van't Hoff and Armstrong, Vater and Cameron.

The solubility curves for sodium sulphate heptahydrate in solutions of sodium chloride were shown to be very similar to those for the decahydrate. In the case of the decahydrate at lower temperatures and the heptahydrate, the curves were shown to have minimum points, the significance of which is not apparent at the present time.

'The Evolution of Metallic Retorts' (with samples): W. H. SEAMAN.

Before commencing the paper the speaker showed a very perfect copy, just received from England, of Boerhaave's 'New Method of Chemistry,' in two volumes, second edition, 1741. Boerhaave was born in 1668, died in 1738, was famous as a physician, botanist and chemist, and was one of the first to recognize the independence of the latter science.

The first metallic retorts were copper flasks just like the olive-oil flasks of the early chemists with a gallows screw added. In a lot of scrap of Professor Henry's apparatus about to be sold thirty years ago, the author found two wrought-iron retorts with walls a centimeter thick, and shaped just like a glass tubular retort that are types of this class.

The next retort exhibited was a pear-shaped vessel. It had a feed wheel on top, and was set in an egg stove, the bottom made red hot and $KClO_3$ fed in by the wheel. The O was taken off by the side pipe.

Next was a kettle-shaped retort patented by the author. Its peculiarity is that all parts draw together by the gallows screw, while the top is durable with ground joint, and the bottom, being thin, heats quickly and can be cheaply renewed.

Next we have the cylindrical sheet metal retort which admits of moving the bunsen burner along its length so as to decompose the charge in successive portions.

The latest development is the little frustrum of a cone, with gallows screw top and two pipes, one for delivery and one for the introduction of an inert gas or other purpose that may be desired. In this oxygen may be made, coal distilled, etc. They are sold by the Chicago Laboratory Supply Co., price one

dollar, and are one of the most useful acquisitions we have lately had made to laboratory apparatus.

'Starch as an Adulterant or Drier in Butter, and a Study of Glucose in Butters': G. E. PATRICK and D. STUART.

1. The paper describes first a canned butter which was found to contain, besides about 15 per cent. of glucose, 3.15 per cent. of starch, either potato starch or a variety closely resembling it. The starch was probably added as a drier; it is said to be sometimes used for this purpose in remanufactured butter. The complete analysis of this butter was: water, 27.19; fat, 40.36; ash, 12.65 (all NaCl except .65 impurities); casein (N x 6.25), 0.86; starch, 3.15; other organic matter, 15.8. Assuming .3 per cent. of lactose, there remains 15.5 per cent. of organic matter which was set down as glucose, since no other organic substance was identified. The aqueous extracts, of 100 cc. volume, from 26.05 grams of the butter, that is, a 'normal sugar solution,' polarized 26.2 degrees on the cane sugar scale (Soleil-Ventzke).

2. With four glucosed butters studied, whole 'normal sugar solutions' polarized respectively 7.0, 11.0, 18.5 and 26.2 degrees, and whose percentages of organic matter designated glucose (as in the case above) were respectively 7.0, 7.9, 10.6 and 15.5 per cent., the rotary and copper reducing powers of the aqueous extracts being referred to these amounts of dry matter, the copper reducing power was in every case (possibly excepting one) too low to correspond to the rotary power, according to Rolfe and Defren, if the entire matter were pure glucose. Sucrose was suspected and inversion was tried by means of saccharine, following the method of Tolman. In only two of the four cases was the rotation appreciably lowered. In these two—and these two butters were canned by the same firm—there was a marked reduction of rotation, indicating (of course not proving) the presence of cane sugar to the amount of about 1.3 per cent. on the butters. The increase of copper reduction, by inversion, was not determined at the time; but several weeks later, the small residual samples having been meantime at laboratory temperature, one was tested, and the increased copper reduction after inversion was found to correspond to .83 per cent. sucrose in the butter, while the decrease of rotation by inversion at this time corresponded to only 1.0 per cent. sucrose. As glucose is added to butters in the form of a sirup, and as there are upon the market glucose sirups containing admixture of cane sugar, the presence of the latter in a glucosed butter need not be so very surprising. Aqueous extracts, 'normal sugar solutions' of 49 non-glucosed butters polarized from 0 to .5 degree, averaging .22 degree. Five ladled butters out of 15 examined polarized from 3.4 to 5.7 degrees, showing admixture of glucose. Glucose is frequently used by ladlers to improve the appearance of their product.

L. S. MUNSON,
Secretary.

ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

THE 324th meeting was held December 7. Mr. Paul Beckwith presented a type series of Philippine swords, from the National Museum, with description of their use, and stated the rank and people to which each sword belongs.

President W. H. Holmes presented some rare examples of ancient Mexican art, lately acquired by the National Museum. These consisted of pottery and stone carvings, showing exceptional artistic feeling in their treatment.

The paper of the evening was on 'Le Culte des Pierres en France,' by M. Paul Sebillot, translated and read by Mr. Jos. D. McGuire. Some months ago an arrangement was made between the Société d' Anthropologie de Paris and the Anthropological Society of Washington to exchange communications for one meeting during the winter. M. Sebillot's paper is the result of this intersociety comity. M. Sebillot has made extensive historical and observational researches on the great body of folk-lore and customs connected with the megalithic monuments of France, which really constituted a cult of stones coming down from ancient times. In general the customs are divinitory and may be grouped under the head of lithomancy, the idea being to look into the

future, for instance, the maids as to marriage and the matrons as to fecundity. On the whole the Cult des Pierres seems to be feminine. The strange customs long inhibited are still secretly practiced in France and M. Sebillot has handled this delicate subject with great detail and frankness. The paper was illustrated by a large series of photographs of the megalithic monuments, lent by Dr. Thomas Wilson.

Dr. J. Walter Fewkes in discussing the paper said that he appreciated this great contribution to knowledge, and further that a number of customs among the Zuni and Moki are similar to those mentioned by M. Sebillot. Mr. W J McGee and Dr. Thomas Wilson also discussed the question of the worship of stones in America.

The Society passed a vote of thanks to M. Sebillot and requested the publication of the paper in the *Anthropologist.*

WALTER HOUGH.

DISCUSSION AND CORRESPONDENCE.

NOTES ON CUBAN FOSSIL MAMMALS.

TO THE EDITOR OF SCIENCE: The reported occurrence in Cuba of certain fossil mammals has been used by several geologists, the first of whom was Manuel Fernandez de Castro, as evidence of former land connection between Cuba and the continent of North America in Pleistocene time.

The fossil mammals reported from this island belong to the genera *Hippopotamus, Equus, Mastodon* and *Megalocnus,* a subgenus of *Megalonix.* Leidy* examined specimens sent him by Poey, and published the opinion that the remains of the horse appear not to differ from the corresponding parts of the recent animal, and it is even doubtful if they are to be considered indigenous fossils. Concerning the hippopotamus remains, which consisted of isolated canines, he says that 'they probably also belong to the recent animal.' The same opinion was expressed by Pomel.† Vertebrate paleontologists do not consider isolated horse teeth sufficient data for the determination of species. So far as I have been able to glean from the literature, the remains of the so-called fossil horses from Cuba, reputed to be of Pleistocene age, are fragmentary, and therefore cannot be considered as possessing any paleontologic value. It has been shown that the *Mastodon** remains were not indigenous to Cuba, but were contained in a box of fossils from Honduras sent by del Monte to the Royal Academy of Sciences of Havana.

These notes seem to show conclusively that the three mammals considered above were not indigenous to the island of Cuba.

The fourth genus, *Megalocnus,* remains to be considered. According to de Castro's first notice,† this specimen was collected at Ciego Montero, a place noted for warm baths, in the jurisdiction of Cienfuegos, by José Figueroa, a young student of the Royal University. This reference is given as a quotation from a note read by Poey to the Havana Academy in 1861. I have not seen this note by Poey in print. The subsequent publications until 1892 are simply quotations of the above given locality. In the *Anales de la Real Academia de la Habana,* Vol. III., page 656, April, 1871, a note is inserted by Poey asking for information concerning the locality of certain large fossils which were sent to de Castro. On page 698 of the same volume it is stated that this box of fossils was sent by Leonardo del Monte to the Havana Academy of Sciences and contained three fossils from Honduras. According to the note of Poey‡ this box contained specimens of *Mastodon humboldti,* but Poey himself does not verify the locality whence the *Megalocnus* came.

As there have been so many extraneous fossils confused in the so-called Cuban fossil mammalian fauna, it has occurred to me that

* *Proc. of the Acad. of Nat. Sci. Phila.*, Vol. XX., 1868, pp. 179.

† *Comptes Rendus,* Paris, Vol. LXVII., 1868, p. 850.

* For note by Poey regarding the original locality of the *Mastodon, M. humboldti,* see *Anal. Real. Acad. Cien. Habana,* Vol. VIII., pp. 124–126, August, 1871.

† *Anal. Real. Acad. Cien Habana,* Vol. I., p. 58, Sept., 1864.

‡ *Anal. Real. Acad. Cien. Habana,* Vol. VIII., pp. 124–126.