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Physical Chemistry for Beginners. DR. CH. VAN DERVENTER. With an Introduction by PROFESSOR J. H VAN'T HOFF. Translated by BERTRAM B. BOTHROW. New York, John Wiley & Sons; London, Chapman & Co. 1899. Pp. x + 154. $1.50.

SCIENTIFIC JOURNALS AND ARTICLES.

THE *Auk* for January is an unusually large number, and consequently is a little late in making its appearance. It commences with Mr. Chapman's discussion of the 'Relationships of *Ammodramus maritimus* and its Allies,' which is followed by Mr. O. B. Warren's 'Chapter in the Life History of the Canada Jay.' Mr. Oberholser has a paper on 'The Blue Honey-Creepers of Tropical America,' for which the new generic name *Cyanerpes* is proposed, and Dr. Gill considers the generic names *Pediocætes* and *Pooecætes*, concluding that they must give way to *Pedioecetes* and *Pooecetes*. Many new species and subspecies are described, a New *Hylocichla* by Mr. Oberholser, a number of new forms from Mexico by Mr. Nelson, and several new species and subspecies of N. A. *Fringillidæ* by Mr. Ridgway. Under the caption 'Truth versus Error,' Mr. Elliot and Dr. Allen continue the discussion of the propriety of correcting mis-spelled scientific names. Mr. Witmer Stone presents a long report, very encouraging in parts, on 'The Protection of North American Birds,' and, finally, is the Ninth Supplement to the A. O. U. Check List. This contains a long list of changes, the most startling of which, perhaps, is at the outset, where the generic name for the Loons is decided to be *Gavia* and the family name *Gaviidæ*.

THE contents of *The American Journal of Science* for February are as follows:

'Contribution to the Study of Contact Metamorphism,' by J. M. Clements.

'Origin of Mammals,' by H. F. Osborn.

'Chemical Composition of Tourmaline,' by S. L. Penfield and H. W. Foote.

'Littoral Mollusks from Cape Fairweather, Patagonia, by H. A. Pilsbry.

'Thermodynamic Relations for Steam,' by G. P. Starkweather.

'Descriptions of imperfectly known and new Actinians, with critical notes on other species, III,' by A. E. Verrill.

'Volumetric Method for the Estimation of Boric Acid,' by L. C. Jones.

SOCIETIES AND ACADEMIES.

THE TEXAS ACADEMY OF SCIENCES.

THE midwinter meeting of the Texas Academy of Science was held in Austin during the last week of December. The program was as follows:

Tuesday, December 27th.—(1) 'Do the Reactions of the Lower Animals due to Injury indicate Pain Sensations?' Professor W. W. Norman, University of Texas. Numerous experiments upon living animals were described in detail and the conclusion reached that so far as the invertebrates and the lower vertebrates are concerned the reactions due to injury do not necessarily indicate pain. (2) 'Three Recent Gifts to the University of Texas,' Dr. W. J. Battle. The gifts described in this paper consisted of, 1st, a storage amphora from the cellar of the Courts of Justinian in Constantinople; 2d, a stone bearing an inscription recording the gift of a crown to one Lysagoras by the people of Ilium, and 3d, a twelfth century manuscript of the Gospels from the Island of Prinkipos, Sea of Marmora. These interesting objects were presented to the University by the Hon. Alexander Terrell, late Minister of the United States to Turkey.

Wednesday, December 28th.—(1) 'Some New Measurements of Electric Waves,' Regent R. S. Hyer, Southwestern University. This valu-

able paper is already in the hands of the printer and will soon be ready for distribution. (2) 'Variations of Indian Corn when brought from New York to Texas,' Professor H. Ness, Agricultural and Mechanical College of Texas. The experiments here described were begun in 1896 at the suggestion of Professor L. H. Bailey, of Cornell University. Corn, of the same varieties, was planted at Ithaca, New York, and College Station, Texas; comparative notes taken, and the results carefully tabulated. (3) 'An Analysis of the Factors determining the Geographical Distribution of Plants in Texas' (read by title), Dr. William L. Bray, University of Texas. (4) 'Note on the Descent of Erythronium Bulbs into the Soil,' Professor O. C. Charlton, Baylor University. (5) 'A Review of Bulletin, No. 151, of the United States Geological Survey,' 'The Lower Cretaceous Gryphæas of the Texas Region,' by Robert T. Hill and T. Wayland Vaughan, Dr. Frederic W. Simonds, University of Texas.

The recent publications of the Academy are: 'Applications of Non-Euclidean Geometry,' by Dr. George Bruce Halsted; Address before the Academy, by President L. S. Ross; 'The Essential Differences between Man and Other Animals,' by Dr. S. E. Mezes; 'Pedagogical Notes on Mensuration,' by Arthur Lefevre, C.E.; 'Science and the State,' by the President of the Academy, Professor T. U. Taylor.

Frederic W. Simonds.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

The 494th meeting of the Society was held January 21st, at 8 p. m., at the Cosmos Club. An informal communication of an exceedingly interesting character was given by Surgeon-General Sternberg on Radiographs, accompanied by the exhibition of some remarkable photographs by the X-Rays. The first regular paper was by Dr. L. A. Bauer (read by Mr. J. F. Hayford, of the Coast and Geodetic Survey), the subject being 'The Decomposition of the Earth's Permanent Magnetic Field.' This paper was an attempt to resolve the Earth's permanent magnetic field into component ones physically interpretable. The normal distribution of the Earth's magnetism is defined as that which can be regarded as resulting from a uniform magnetization about a diameter inclined to the rotation axis. The normal magnetic components (northerly, easterly and vertical) are next computed for 1800 points on the Earth's surface between parallels 60° N. and 60° S. These are then subtracted from the observed values and thus the residual components are obtained. With the aid of these is mapped out that portion of the Earth's magnetism which cannot be referred to a uniform magnetization (or to equivalent effects) about a diameter inclined to the Earth's axis. The residual field consists mainly of two transverse magnetizations, one magnetic system lying in the northern hemisphere, the north end attracting pole being east of the south end attracting pole, and the second system lying in the southern hemisphere, the direction of magnetization being the reverse of the former. Striking coincidences manifest themselves between the characteristics of the residual field and those of the diurnal variation field as determined by Schuster. The foci of both fields lie near parallels 40° (N. and S.) As the author is conducting other related investigations, he refrains from drawing definite conclusions until these investigations have been completed. The second paper was by Mr. C. F. Marvin and was a description of the apparatus employed at several Weather Bureau stations during the past summer for the purpose of making a preliminary survey of meteorological conditions in the upper air. The results obtained from these investigations are now being classified and worked up. A special form of Hargrave cellular kite was employed and controlled in flight from a convenient form of hand windlass. The automatic records were obtained by means of a special kite meteorograph, of the author's design, and adapted to record the temperature, pressure, and humidity of the air and wind velocity. The meteorograph was attached firmly to the kite. Its weight, complete, was 2.1 pounds; that of the kite, about 8 pounds.

E. D. Preston,
Secretary.

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

The 284th regular meeting of the Anthropological Society was held Tuesday evening, Jan-

uary 3, 1899. The members of the Woman's Anthropological Society were elected to membership in the Society, the former Society as a body being absorbed by the Anthropological Society. Miss Alice Fletcher read a paper on 'A Pawnee Ritual,' in which she laid stress upon the fact that a literal translation of the ritual did not convey the true meaning, did not express the poetic thoughts or the real philosophy of the ritual, and these could only be obtained by a free translation, based upon an intimate knowledge of the Indian's picturesque and poetic expression of his thoughts.

Mr. Francis La Flesche sang a part of the ritual, to show the manner in which the Priest rendered it.

Discussed by Mr. Cushing.

Mr. W. H. Holmes read a paper on 'One Step in the Evolution of the Maya Temple.' Mr. Holmes described the remarkable edifices the ruins of which are found in numerous ancient cities of the Maya territory, and dwelt briefly upon their origin and development, but the chief object of the paper was to indicate the very pronounced influence of the corbelled arch, sometimes called the Maya arch, on the buildings. Without stopping to discuss the question as to whether the suggestion of this method of spanning chamber spaces came from within or without the Maya province, the manner in which it would probably supplant the horizontal beam of wood or the slab of stone was pointed out. Offsetting the upper stones of a wall enabled the builder to span the space with shorter beams or stones and led finally to the exclusive use of stone, a great step in the direction of permanency. The effect of the arch upon the chambers was to widen them considerably and greatly to increase their height; but the most remarkable result was exterior, as the height was more than doubled. The doorways were not changed, however, and the original façade remained the same, being limited above by a heavy cornice representing the ends of the horizontal beams or eaves of the early period. The added upper wall, carried up vertically in Yucatan and at a high angle in more southern sections, was devoted entirely to ornament and became the most remarkable feature of the structures, affording the builders no end of opportunities for displaying their genius for sculpture and their devotion to symbolism.

Discussed by Messrs. Cushing and McGee.

J. H. McCORMICK,
Secretary.

THE NEW YORK ACADEMY OF SCIENCES—SECTION OF PSYCHOLOGY AND ANTHROPOLOGY, JANUARY 23.

THERE was an unusually good attendance at the regular meeting of the Section. From the psychologists there were papers by Chas. H. Judd, of New York University, on 'The Visual Perception of Linear Distances;' by B. B. Breese, of Columbia, on 'Some Experiments in the Voluntary Control of Retinal Rivalry,' and by C. B. Bliss, on 'A Modification of one of the Psychophysical Methods.'

On the part of the anthropologists there was a brief report by the returning members of the expedition sent out by the American Museum of Natural History to study the Gilliak tribes of eastern Asia. A paper was then read by A. Hrdlicka, of the Museum, giving the result of a study of the custom of painting bones.

Two other papers on anthropology contained in the program went over to the next meeting for lack of time.

C. B. BLISS,
Secretary.

SECTION OF ASTRONOMY AND PHYSICS—JANUARY 2, 1899.

THE section was called to order by Chairman Dudley, 19 persons being present. In the absence of the Secretary, Mr. T. G. White was elected Secretary *pro tem.*

The first paper of the evening was by Professor Wm. Hallock, printed on page 210.

In the discussion which followed, Professor D. W. Hering suggested connecting the string or spiral by which impulses are imparted to the ring, to a tuning fork, the rate of vibration of which could be regulated by weighing and which could be operated electrically, for reciprocating motion of small amplitude and of a known rate.

The second paper was by Dr. F. L. Tufts on the 'Absorption and reflection of sound waves

by porous materials.' This paper gave the results of experiments on the transmission and reflection of sound by such materials as flour, sand, sawdust, shot and a few different kinds of cloths. It was stated that when sound waves strike against materials pervious to air they act very much like a pneumatic pressure, and that the amount of sand transmitted through such materials is inversely proportional to the resistance offered by the materials to the passage of a direct current of air. The results of the experiments upon the reflection of sound from the same materials showed that those materials that transmitted the greatest amount of sound reflected the least. The paper also contained an account of some experiments in which the sound waves had to pass through some pervious material, such as the curtains upon a wall, and were then reflected back through the same by the impervious wall.

In the discussion that followed the reading of the paper Professor Hallock suggested the practical application to the improvement of the acoustics of rooms which might result from these investigations, and the futility of the method of string wires in large halls to break up echoes, which had been often advised, but which was disproved by these experiments. Mr. Dudley also spoke of the attempts that had been made to obtain materials absorptive of sound, to deaden the noise in railroad cars.

The third paper was by Mr. P. H. Dudley, on 'Translative curves of counter balance and crank pins in running locomotives.' It was profusely illustrated by lantern views of locomotives in the various positions described. These showed the loci of the center of gravity of the counter weights, crank pins and driving axles in running locomotives. Some of the photographs showed the position of the counter weights in the driving wheels of running locomotives in reference to the stremmatograph under the rail. The counter weights added to the driving wheels to balance the reciprocating parts, crank pins, main and side connecting rods, when the engine is running, besides rotating around the axles, move along the rails per revolution a distance equal to the circumference of the drivers. The locus of the center of gravity of the counter weights six inches from the tread of the tire in a seven-feet driving wheel travels above the locus of the driving axle more than three times as far as it does below. The locus of the center of gravity of the crank pin for 24-inch stroke of piston in a driving wheel of 7-feet diameter travels 44 per cent. more above the locus of the driving axle than below it.

The above cited facts show that the relative velocities of the center of gravity of the counter weights and crank pins are not constant for each portion of a revolution as in the stationary engine, but are unequal and constantly changing. Therefore, the forces generated are unequal, and perfect counter balance does not obtain in the locomotive. Part of the unbalanced forces must be absorbed by the locomotive itself and part by the permanent way. The upper portion of the driving wheel moves much faster than the lower portion running on and in contact with the rail, in striking contrast to the uniform velocity of the rim of the fly wheel of a stationary engine.

Dr. Dudley also showed lantern views of running locomotives, in which the lower spokes of the driving wheels were sharply defined, while the upper ones, running so much faster, were not stopped for the same exposure.

Reginald Gordon,
Secretary.

The Academy of Science of St. Louis.

At the meeting of the Academy of Science of St. Louis of January 23, 1899, a paper by Professor A. S. Hitchcock, entitled 'Studies on Subterranean Organs, Part I, Compositæ of the vicinity of Manhattan, Kansas,' dealing with the structure of a number of rootstocks with reference to their environment, was presented in abstract. Mr. C. H. Thompson also spoke of some plants the flowers of which originate endogenously. He mentioned several species of *Rhipsalis* in which the much reduced leaves grow on triangular or cylindrical very succulent stems, their axillary buds originating deep down in the soft tissue and sometimes having a passage-way extending toward the surface. In two species of *Rhipsalis* (*R. paradoxa* and *R. floccosa*) there is no such passage-way, and the bud, in developing, breaks

through the epidermis. In *Rhipsalis glaucosa* a number of accessory abortive flowers were found. *Cuscuta glomerata* was mentioned as the only other plant in which, so far as the speaker knew, subepidermal flowers occur.

One person was elected to active membership.

WILLIAM TRELEASE,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

ZOOLOGICAL NOMENCLATURE.

EDITOR OF SCIENCE: I fear that the subject may verge on becoming tedious to your readers, but will ask the privilege of concluding my part in the discussion by a few comments on two points raised in Mr. Bather's communication of January 10th (p. 154).

It will hardly be denied that the date of printing will always be useful to the systematist in noting a period earlier than which publication of a paper *cannot* be claimed, even if we ignore the obvious fact that in nearly every case it will now-a-days closely approach the date of distribution or actual publication. Hence, the committee should consider well before minimizing its value.

Secondly, it has been held, with some plausibility, that the distribution by favor alone should not constitute publication, but that the ability of any one interested to procure a paper by purchase is essential to an effective publication. If now, by a doctrine of ethics which is certainly novel to me, the committee decides that no paper can be regarded as published until the society which prints it is ready to sell the complete volume of which it may form a part, it is obvious that the committee has it in contemplation to put a quietus on the prompt publication of separate papers, unless this is done commercially by the society in question, in the first place. To this proposition I believe it will be impossible to obtain the assent of workers in systematic natural history, and justly so.

The reasons are obvious and need not be enlarged upon. I think it is not unfair to add that most libraries in this country would rather pride themselves on procuring, even at the cost of seven shillings, at the earliest practicable moment, a paper demanded by their readers; and would consider its belated acquisition in the miscellaneous volume of a scientific society, subsequently, as no reflection upon their performance of their duties to the public.

WM. H. DALL.

THE RED-BEDS OF KANSAS.

THE correlation of the Red-Beds of Kansas has hitherto been impossible to satisfactorily settle, as has been stated by Professor Prosser in his admirable report upon them in the second volume of the University Geological Survey of Kansas. Many persons have diligently sought for fossils in them, but entirely without success until recently. About two years ago Mr. C. N. Gould discovered a horizon just south of the Kansas line and at the base of the Kansas series, containing large numbers of a small phyllopod crustacean, examples of which, when referred to Professor T. Rupert Jones, through Professor Prosser, were determined as *Estheria minuta* with some doubt, as stated in his paper in the *Geological Magazine* (1898, p. 291).

Associated with these crustacean remains, the blocks sent with the skeleton showing numerous specimens, was a large part of the skeleton of an amphibian. This specimen is now in the University of Kansas collection, but so far has been only partly freed from its matrix, a work of much tediousness. The parts already brought to light, however, enable me to determine it as *Eryops megacephalus* Cope, a form described from the 'Permian' of Texas.

This identification settles once for all the horizon whence it came as Permian, if the Texas beds be really of that age. There are several hundred feet of deposits in Kansas above this horizon that still possibly may be considered as Triassic, but there is no reason for so doing. *Estheria minuta* is a Triassic species, but, even if correctly determined, its value is slight in comparison with that of the vertebrate in the correlation of the beds. It must be remembered, however, that *Eryops* is by no means necessarily characteristic of the Permian.

S. W. WILLISTON.

MEN OF SCIENCE AND ANTI-VIVISECTION.

IF, according to my critic (SCIENCE, Dec. 16, 1898, p. 873), the efforts of the anti-vivisection-