Cyclopedia of American Horticulture. L. H. BAILEY assisted by WILHELM MILLER and many expert Cultivators and Botanists. In 4 volumes. New York, The Macmillan Company. 1900. Vol. I. A.–D. Pp. xxii + 509. $5.00.

SCIENTIFIC JOURNALS AND ARTICLES.

American Chemical Journal, January, 1900. 'On the Molecular Rearrangement of *o*-Aminophenylethyl Carbonate to *o*-Oxyphenylurethane,' by J. H. Ransom. 'Diazocaffeine,' by M. Gomberg. 'The Action of Ethyl Iodide on Tartaric Ester and Sodium Ethylate,' by J. E. Bucher. This number also contains a note on 'Improvements in the Manufacture of Sulphuric Acid.'

February, 1900. 'On Some Abnormal Freezing-point Lowerings produced by Chlorides and Bromides of the Alkaline Earths,' by H. C. Jones and V. J. Chambers. 'The Preparation of Pure Tellurium,' by J. F. Norris, H. Fay and D. W. Edgerly. The authors first prepared pure basic nitrate and then prepared the tellurium from this. 'The Reduction of Selenium Dioxide by Sodium Thiosulphate,' by J. F. Norris and H. Fay. 'Action of Picryl Chloride on Pyrocatechin in Presence of Alkalies,' by H. W. Hillyer. 'Camphoric Acid,' by W. A. Noyes. 'On the Rearrangement of Imido-esters,' by H. L. Wheeler. 'The Double Halides of Antimony with Aniline and the Toluidines,' by H. H. Higbee. 'On the Rancidity of Fats,' by I. Nagel. A note on 'The Wax of the Bacillariaceæ and its Relation to Petroleum.' J. ELLIOTT GILPIN.

The American Naturalist for January is a little late in making its appearance, but its contents may excuse the delay. The first article, by Henry Fairfield Osborn, is a most important contribution to the subject of 'Intercentra and Hypapophyses in the Cervical Region of Mosasaurs, Lizards and Sphenodon,' and is well illustrated. Ales Hrdlicka describes in some detail the 'Arrangement and Preservation of Large Collections of Human Bones for Purposes of Investigation,' and A. D. Mead has an article 'On the Correlation between Growth and Food Supply in Starfish,' in which he shows that starfishes of the same age may vary greatly in size. E. H. Eaton discusses 'The Zoology of the Horn Expedition' to Central Australia, and its bearing on the faunal affinities and geologic changes of Australia, and Henry Fairfield Osborn notes 'A Glacial Pot-Hole in the Hudson River Shales near Catskill, N. Y.' John H. Lovell in 'The Visitors of the Caprifoliaceæ,' describes the structural peculiarities of various genera and species of the honeysuckle family and notes the species of insects which he has observed to visit them, supplementing his notes by the observations of others. There is a large number of reviews, particularly of zoological papers.

THE *Journal of the Boston Society of Medical Science* for January opens with an article by Harold C. Ernst on 'Instruction in Bacteriology in the Medical Schools of America and Europe,' giving an analysis of the replies received from ninety-eight institutions to a circular letter of inquiry. The remainder of the number is devoted to abstracts of papers presented at the meeting of the American Public Health Association, Section of Bacteriology and Chemistry, held October 30, 1899.

SOCIETIES AND ACADEMIES.

SCIENCE CLUB OF THE UNIVERSITY OF WISCONSIN.

AT a special meeting of the Science Club of the University of Wisconsin, on the evening of January 24th, Mr. T. C. Chamberlin, of the University of Chicago, addressed the Club on 'Some recent studies of fundamental problems in geology.' Mr. Chamberlin was for five years president of the University of Wisconsin, and a large audience gathered to greet him and to listen to his admirable presentation of an exceedingly difficult subject. By reason of the fact that many of his hearers were not specialists in science, the address was semi-popular, and by special request of the president of the Club, Mr. C. R. Van Hise, it treated particularly of Mr. Chamberlin's well-known studies in this field. These studies have already engaged his attention for a number of years and are not yet completed. Some of the most important conclusions reached by Mr. Chamberlin were given to his audience as he explained 'in confidence to his friends,' as they are not

yet in form for publication. The problems discussed—the origin of the solar system, the source of the earth's heat, the earth's physiognomy, its atmosphere, etc., had all been involved in an attempt to frame an adequate working hypothesis to explain the glacial periods.

It was shown that all the hypotheses thus far advanced to explain the glacial periods fail of correspondence with the known facts of geology, particularly the discovery of glacial periods earlier than that of the Quaternary. The kinetic theory of gases applied to the atmospheres of the planets was found to invalidate the La Placian theory of the universe as well as the later theory of meteoric swarms. The atmosphere being the blanket of the earth the explanation of the earth's warm and cold periods was sought in the variation of the amount of carbon dioxide contained, which would materially affect screening or blanketing capacity. Alternate depletion and repletion of the carbon dioxide of the atmosphere might be caused by the variation in the size of land areas and the consequent variation in the carbonation of rocks, and by the separation of carbonates from the littoral portions of the seas. Mr. Chamberlin discussed a theory of the origin of the earth by the slow accretion of solid matter from without, a theory in contrast with that of La Place, in that instead of beginning with an enormously heavy atmosphere, on his theory an atmosphere could not exist until the earth was about one-tenth grown, and would then be extremely attenuated to increase in density with the enlargement of the planet. The exceeding difficulty of securing data for calculation in this field was emphasized, as was the necessity of submitting not one but a number of working hypotheses to the most searching of tests.

Wm. H. Hobbs.

ZOOLOGICAL CLUB, UNIVERSITY OF CHICAGO, MEETINGS OF DECEMBER, 1899.

The session of December 15th was devoted to a paper by Mr. M. F. Guyer on 'Spermatogenesis of Hybrid Pigeons.' "In the spermatogenesis of hybrid pigeons several abnormalities are manifested. These may be classified conveniently under three heads: (1) abnormalities in the structure of the spermatozoa; (2) abnormalities in mitoses; (3) degeneration of the germinal cells. Abnormalities in the spermatozoan structure were present in sterile hybrids, the most noticeable feature being a varicosity or swelling about the middle of the head. In tracing the development of the spermatozoa, this curious modification was found to be due apparently to a lack of development of the head; the nucleus did not elongate completely as in normal spermatogenesis. Abnormalities in mitosis were marked in both fertile and sterile hybrids. Large numbers of multipolar spindles were present. These were usually of the tripolar type. Occasionally two distinct and separate spindles occurred in one cell. The spermatocytes of the first order were the the cells that showed this phenomenon to the greatest extent. In the normal pigeon the chromosomes in the spermatogonia are sixteen in number and in the primary spermatocyte eight. The latter are laid down in rings and each is evidently double. On the spermatogonia of the hybrid there were sixteen chromosomes and in the primary spermatocytes often more than eight. In the latter there may be several of the large double type and a number of smaller rings, or sixteen small ring chromosomes may occur. If sixteen rings were present they were usually located on two separate spindles, eight to each spindle. Another peculiarity in the mitosis was the frequent inequality in the division of the chromosomes, in some instances only about a fourth of a chromosome going to one pole. It is a well known fact that the descendants of hybrids are remarkably variable, hence the possibility that this irregularity in chromatin distribution of the parent germ cell and the variability of the offspring may be connected in some way immediately suggests itself. As for the degeneration of the germ cells, this phenomenon was observed in sterile birds only."

At the meeting of December 20th, Dr. E. S. Riggs, of the Field Columbian Museum, contributed an illustrated lecture, 'The Fossil Mammals of North America.' A large number of lantern slides were exhibited; among them many reproductions in color of the restorations of fossil mammals executed by Mr. Knight.

C. M. Child.

BIOLOGICAL SOCIETY OF WASHINGTON.

THE 317th meeting was held on Saturday, January 27th. William Palmer exhibited a series of specimens of the Christmas Fern, *Polystichum acrostichoides*, showing variations in growth due to varying conditions of environment. H. J. Webber showed a portion of one of the negatively geotropic roots of the mangrove, *Rhizophora mangle*, stating that their function, like that of the 'knees' of the cypress was that of aëration, and illustrating his remarks with photographs.

Thomas A. Williams presented some 'Notes on a New Species of *Lecidea* from Mexico,' stating that it was related to *L. speirea* Nyl. It is peculiar on account of its *Lecanora*-like fruit, the apothecia presenting a white border when young and being borne on slight elevations of the thallus, after the manner of the species of Bæomyces with sub-sessile fruits. In some instances gonidia were found in the apothecia, but their occurrence seemed to be accidental rather than normal. The bearing of these structural peculiarities on the systematic relationship of this and other *Lecideas* was discussed.

Barton W. Evermann made 'Some Observations concerning Species and Subspecies', basing his remarks upon the species of darters found in the waters of Lake Maxinkuckee and a new species found in Aubeenaubee Creek, the principal tributary of the lake, but not in the lake itself. This fish is evidently derived from *Etheostoma iowæ*, which is found in the lake, but differs from it clearly and constantly, and no intergrading forms are known. Should, for some reason the lake species and that from the creek invade each other's habitat and interbreed, the result would be the production of individuals possessing characters common to the two species and apparently placing them in the relation of species and subspecies, although if this supposed case were definitely *known* to have occurred, we should regard the individuals as hybrids and the other forms as still distinct species. The speaker reviewed the chief categories of subspecies, concluding that many trinomials were in use where a careful examination of the facts would show that the supposed subspecies are really species. The paper will appear in SCIENCE.

T. W. STANTON,
Secretary.

NEW YORK ACADEMY OF SCIENCE.
SECTION OF ANTHROPOLOGY AND PSYCHOLOGY.

THE regular meeting of the Section was held on Monday, January 22d. The first paper of the evening, entitled 'Some Phenomena of Indirect Vision,' was presented by Mr. Clark Wissler. Experiments were made by exposing in the indirect field of vision, while the attention of the observer was fully occupied with objects in the direct field, small letters or numerals. The subjects were not conscious of seeing the characters presented in the indirect field, indeed, one of the subjects whose results were reported did not know until several tests had been made that the characters were there at all. In spite of this failure to receive conscious impressions from the letters and figures, two subjects were found who could by association, and afterwards by memory, give in a large number of cases the correct numeral or letter. These subjects made their associations in the form of visualized images. Many of the errors made were similar to those made in normal vision. Thus, *c* was mistaken for *o*, *35* for *55*, etc. It was held that the experiments suggest a relation between normal phenomena and the abnormal as seen in the hysterical eye, and that they point out a way to more complicated experiments in induced automatic movements.

Professor J. McK. Cattell presented a paper on 'The Relations of Time and Space in Vision.' He described experiments on the perception of moving surfaces, which show that a time series may be perceived as a spacial continuum, and explained that the same phenomena held in the ordinary vision of daily life. Although the eyes, head and body are in continual movement, and the images on the retina are constantly shifting, the field of vision appears to be distinct and stationary. Thus if one glances along a row of books, images follow one another on each retinal element in rapid succession, but these successive and rapid changes result in the perception of a space continuum, all the objects being distinct and arranged side by side.

Professor Buchner read a paper on 'Number Forms.' The paper described with the aid of sketches the fixed visualizations experienced since childhood by a woman 35 years of age.

There are three distinct, uncolored tridimensional forms. The first is half fan-like in shape, lying almost entirely to the left of the mental point of regard, and includes the numbers from 1 to 100. The second includes the names of eight days, from Sunday to Sunday. The third has the names of the twelve months from January to December. The paper pointed out the elements which must appear in any theory of the genesis of the phenomena to which this group belongs.

CHARLES H. JUDD,
Secretary.

CURRENT NOTES ON PHYSIOGRAPHY.

WESTERN NEBRASKA.

A REPORT on the geology and water resources of the westernmost twelfth of Nebraska, by N. H. Darton (19th Ann. Rept. U. S. Geol. Survey, pt. IV., 1899, 721–785, numerous maps and illustrations), presents a very clear picture of an interesting region. The inter-stream areas are generally plateau-like uplands of Tertiary strata, retaining something of their initial smoothness of surface over considerable distances. The sand-hill area of mid-western Nebraska extends west into the broad upland between the North Platte and the Niobrara, where some east-flowing streams are lost. The chief valleys, that of the North Platte being the largest, are cut by streams whose courses seem to be consequent on the general easterly slope given to the region when it was uplifted. Numerous branch streams of unsystematic (insequent) arrangement dissect the valley sides, often producing characteristic bad-lands. The insequent dissection has gone so far between North Platte river and Pumpkinseed creek as to reduce an upland to a narrow ridge with numerous lateral spurs. Pine ridge, trending east and west near the northern border, is the strongest relief in the State; it is a cuesta-like upland whose escarpment is carved into bad-lands by its obsequent streams which descend northward to a denuded area of Cretaceous strata that border the southern flank of the Black hills. The present relation of ground water, springs and streams to a structure and form are well set forth in the later pages of the report. The same author contributes a brief account of the Bad Lands of South Dakota and Nebraska to the September number of the *National Geographic Magazine.*

Mention may be made in this connection of an article by W. D. Matthew on the interpretation of the White river Tertiary strata of Nebraska and South Dakota as an æolian instead of as a lacustrine formation (*Amer. Nat.*, xxxiii., 1899, 403–408).

THE MISSISSIPPI AND MISSOURI RIVERS.

THE annual reports of the commissions on our two greatest rivers (Apps. WW and XX., chief of engineers, United States Army, Washington, 1899) contain a large amount of interesting matter, whose discovery would be much facilitated if the reports were edited with more consideration for their readers. Hundreds of pages without adequate tables of contents and with unchanged page headings make the use of the reports difficult. Numerous measured sections of the Mississippi lead to the conclusion that if the banks are properly revetted to prevent erosion, while levees on the adjacent floodplain restrain the spread of high waters, the channel will be deepened and its capacity to discharge floods increased. The Yazoo basin has 310 miles of levees to protect 7100 square miles of surface. Much money has been spent on the levees by local authorities, and yet it is estimated that the volume of the levees must be increased by more than half in order to bring them up to the proper size. $20,000,000 will be needed to complete the entire levee system; over $2,000,000 having been spent in 1899. The heights of floods, their progress down the river, the locations of levees and areas of overflow are shown on various plates and maps. Besides a new edition of the famous eight-sheet map of the lower Mississippi, a four-sheet map of the upper part of the river was issued during the past year on a scale of 1 : 316,800. No relief is indicated except along the borders of the floodplain, but this suffices to suggest that the valley is the work of a larger river than that now flowing in it; not merely because the valley is wider than the river, but because the curvature of the valley is of a larger pattern than the present river seems capable of producing. The narrow post-glacial rock-walled channel just above Keokuk