technischen Hochschule zu Karlsruhe. Jena, Verlag von Gustav Fischer. 1897. Octavo of 368 pages, illustrated by 40 photographic reproductions and one diagram.

The volume before us represents the first section of a work on bacteriology. It opens with an instructive critical review of those investigations that have played so important a part in the development of our knowledge of the subject, especially as concerns morphology, classification, etc., dwelling at some length upon the historic works of Leeuwenhoek, O. F. Müller, Ehrenberg, Dujardin, Perty, Cohn, Nägeli, and DeBary.

The second section contains a discussion of the morphology, structure, modes of development and reproduction, chemical constitution, and metabolic activities of bacteria; while the third section is devoted to brief considerations of certain specific biological functions of bacteria—such, for instance, as their relation to culture media, their chromogenic functions, their specific properties of fermentation, anærobiosis, phosphorescence, and their relation to light and to temperature.

It is an excellent presentation of these phases of the subject, especially the section relating to the finer structural details of bacteria. Indeed, this portion of the work is particularly elaborate, the subject being treated with much more detail than is usual. In this respect it may serve to satisfy the demands so frequently made by the botanists for more attention on the part of bacteriologists to the morphological side of bacteriology. We must confess ourselves, however, to be of the number who not only find greater entertainment and instruction from the study of the biological functions of bacteria, but who also believe this to be much the more important line along which to develop the work.

This volume contains no reference to the relation of bacteria to the more highly-organized beings, and comparatively little upon their important rôle in the great processes of nature—points that will doubtless receive due attention in the forthcoming second volume of the work.

The literary references are full and are conveniently grouped at the end of each chapter in alphabetical order.

A. C. ABBOTT.

SOCIETIES AND ACADEMIES.

THE 97TH REGULAR MEETING OF THE CHEMICAL SOCIETY OF WASHINGTON, NOVEMBER 11, 1897.

THE first paper of the evening, read by Dr. H. C. Bolton, was entitled 'Hysterical Chemistry,' a term which he applied to the preposterous theories and claims of a certain small group of writers on chemistry who call themselves Monists. They advocate unity of matter and reject identity, replacing the latter by analogies. He gave examples of their method of reasoning, one instance being the following:

"An atom is a hypothesis,
A hypothesis has no weight, therefore
Atomic weight is a nonentity."

The speaker showed that these writers did little or no experimental work, yet claimed to be revolutionizing chemistry by their publications; also that they deserve no serious consideration.

Mr. Wirt Tassin's paper, entitled 'The Preparation of Crystals,' consisted of a review of the several methods of preparing crystals for the determination of their geometrical and physical constants, the methods being grouped under the following heads:

A. Solution, treating of the preparation of crystals of a substance from its solution in a liquid by evaporating and cooling the solution; by the reaction of soluble compounds, or by chemical changes in general. The general rules to be observed being:

1. The crystallization must proceed as slowly as possible.

2. The solution must be of the least viscosity possible.

3. The crystallizing substance must be present in the solution in the greatest quantity.

4. The crystals desired for measurement must be removed from the solution, preferably when it is at its minimum temperature, and must be quickly and completely dried in order to prevent corrosion or etch figures forming.

B. Sublimation, in which case the crystals may be obtained direct, or a non-volatile compound may be obtained as a result of chemical action between two or more volatile substances, or from a volatile substance and a gas.

C. Fusion, where the crystals are secured by slowly cooling a homogeneous magma, or by a

solution of the substance in a molten magma, and the crystals are formed either with or without pressure.

The last paper of the evening was read by Dr. E. A. de Schweinitz, and was entitled 'A Convenient Dropping Bottle.' This bottle was devised especially to be used by ophthalmologists for the purpose of keeping collyria sterile and free from dust, and at the same time one which was very easy to handle, and from which the solution could be dropped into the eye with almost any desired rapidity. It is a small pear-shaped flask with a long tubular neck at a right angle to the bottle. The end of the neck is drawn out to a moderately fine point and provided with three bends, so that the end of the tube dips downward. The object of these bends is to prevent the dust from entering the bottle. At the same time when they are filled with liquid the rest of the solution is sealed. On the side of the flask opposite the neck is a short open arm, to which a small rubber dropping bulb can be attached to regulate the rapidity with which the liquid is allowed to flow out at the bottom. A little cotton should be placed in this arm to keep out the dust. The dropper is adapted for general microchemical and volumetric work.

Professor Chas. E. Munroe made an exhibit of paraformaldehyde and the lamps used in generating formaldehyde from it. This substance is sold in the form of tablets. Contrary to the general belief, it is comparatively readily soluble in hot water. It makes a convenient laboratory source of formaldehyde. The gas is very readily given off from the tablets at comparatively low temperatures.

Mr. V. K. Chesnut exhibited specimens of *Amanita muscaria*, the fungus which caused the recent death, in Washington, of Count de Vecchj, and the serious poisoning of Dr. Daniel J. Kelly. Colored plates were shown, which showed how the fungus was mistaken for that of the closely related but edible species, *Amanita cæsarea*. Brief remarks were also made about the poisonous constituents characteristic of the two most poisonous Amanitas and their characteristic action on the human system.

V. K. Chesnut,
Secretary.

BIOLOGICAL SOCIETY OF WASHINGTON—283RD MEETING, SATURDAY, DECEMBER 4.

Mr. Lyman J. Briggs presented a paper on 'The Causes of Water Movement in Soils,' showing that the capillary movement of water in soils depends upon the form of the surface of the water contained in the capillary space between two soil grains in contact. The direction and relative magnitude of the pressure of films of several geometrical forms was considered, and the resultant movement of water in soils under such conditions was pointed out.

Mr. Sylvester D. Judd read a paper entitled 'Protective Adaptations of Insects from an Ornithological Point of View.' Such protectively colored insects as grasshoppers, he stated, are eaten in large quantities by practically all land birds that are to any extent insectivorous. The *Geometrid* caterpillars, which so closely simulate twigs, were found in the stomachs of a score of our commonest birds. Vile-smelling or ill-flavored insects, such as many bugs, *Carabid* beetles and *Chrysomellid* beetles, are greedily devoured by the majority of land birds. Numbers of species of insects exhibiting warning coloration and protective mimicry are selected for food by birds. The Kingbird catches the *Erastalis* fly that imitates a honey bee. It also takes honey bees, but in doing so selects only the drones. The author concluded by saying that the interaction between insects and birds does not afford the best example of the greatest efficiency of the protective adaptation of insects.

Dr. Theo. Gill spoke on 'The Distinctive Characters of the Molinæ and Ranzaniinæ,' saying that the family represented by the gigantic sunfish of the Northern Atlantic (*Mola mola*) is also represented by another smaller species, but which is generally regarded as nearly related—the *Ranzania truncata*. These two resemble each other so much superficially that many (including Dr. Günther) have combined them in the same genus. Anatomically, however, they are so widely different that they should be distinguished as subfamily types at least, if not as families. The subfamilies were distinguished as long ago as 1838, by Prince Bonaparte, but the characters partly transposed. The Molinæ have the skeleton mostly cartilaginous and the dorsal and anal fin rays invested in the com-

mon skin, while the Ranzaniinæ (*Orthragoriscini Bon*) have the skeleton 'Sub-osseous' and the rays distinct. The most important of the other characters were detailed.

Dr. C. W. Stiles presented a paper on 'The Honorary Ph. D.'

F. A. LUCAS, *Secretary.*

U. S. NATIONAL MUSEUM,
WASHINGTON, D. C.

THE 268TH REGULAR MEETING OF THE ANTHROPOLOGICAL SOCIETY, TUESDAY, DECEMBER 7, 1897.

THE evening was devoted to a symposium upon Anthropology at the Field Columbian Museum, by Professor Wm. H. Holmes; at the American Museum of Natural History, by Professor Otis T. Mason, and at the Brussels International Exposition, by Dr. Thomas Wilson.

Professor Holmes described briefly the origin and growth of the Field Columbian Museum, of Chicago, and presented a photographic view and ground plan of the building—the Art Building of the World's Fair. The plan was colored to show the arrangements of the departments of the Museum, and especial attention was given to Anthropology. The arrangement of the collections was pointed out and the more interesting and valuable exhibits described.

Professor Otis T. Mason gave a description of the arrangement of the exhibits at the American Museum of Natural History in New York, and dwelt upon the Polynesian collection and the method of its being brought together, stating that each object, as it was obtained, was labeled with its origin, with its surrounding history and every fact that it was possible to find. He noted the difference between the various methods employed by the heads of the several museums, and believed that a diversity of methods was valuable, as it gave an opportunity for the display of each man's idea, and that stress was thus laid on the subject from many points of view.

Dr. Thomas Wilson gave a review of the Brussels International Exposition, of which Professor J. H. Gore and himself were the United States Commissioners. The Exposition was primarily a commercial one and was intended to show, first, what Belgium had to sell, and secondly, what she had to buy. The scientific department was under the direction of a number of scientific gentlemen, of whom Professor Houze was Chairman or Director-in-Chief. The scientific department was located in the great hemi-cycle, which embraced one of the great or main entrances.

Since the United States was only allowed $5,000 by Congress for its exhibit, no part of which could be expended for salaries of the Commissioners or for defraying the freight expenses of private exhibitors from America, the exhibit from this country was necessarily smaller than usual.

The anthropologic exhibit was not large, but was very good. The Belgian division was unusually fine, the prehistoric finds of the caves and grottos being very full and complete.

J. H. MCCORMICK,
Secretary.

TORREY BOTANICAL CLUB, OCTOBER 27, 1897.

THE first paper, by Mr. P. A. Rydberg, entitled 'Botanical Exploration in Montana During the Summer of 1897,' discussed the alpine flora of Montana, adding herbarium specimens and drawings. Mr. Rydberg described a collecting trip made by him and Mr. Ernest A. Bessey to Old Hollowtop, a mountain of 10,000 feet altitude in the Pony or South Boulder Mountains. Their characteristic plants, like those of other alpine regions, are remarkable for their small size and their brightly colored flowers. Most of them are but 2–3 inches high; few exceed 5 inches. The mountain side of Old Hollowtop presents a mixture of golden-yellow, indigo-blue, the richest magenta, the most delicate pink, violet and snowy white, with a carpet of the brightest green for a background. The forage plants of these alpine peaks are chiefly small cespitose clovers, and include but few grasses. Among the trees and shrubs of the alpine peaks, the most remarkable were the five small alpine willows collected, forming a light green mat covering the mountain-side above timber line. The smaller willows of the White Mountains and of the Alps and of Siberia are giants compared with these dwarfs of the Rockies. Four of these

Montana willows, with *Salix rotundifolia* from the island of Unalaska, are the smallest shrubs of *Salicaceæ* in the world. Two of these pygmies are new to science; one of which, growing often only half an inch high, is believed to be the smallest species of willow ever known.

Dr. Britton remarked that Mr. Rydberg's Montana trip of last summer was the first expedition sent out officially by the New York Botanic Garden; to which his collection of alpine plants will return.

Professor Burgess referred to a supposed age of thirty-four years for a dwarf willow of about six inches stem from Alaska, and Dr. Rydberg mentioned twelve years as perhaps the age reached by the dwarfs of his present paper, their stems dying along the rooting base too rapidly to permit great age.

Dr. Rusby spoke of Arctic willows as part of the food of beavers in northern Russia, and of reindeer.

The second paper was by Dr. John K. Small, 'On the Genus Eriogonum North of Mexico,' a genus founded by Michaux upon a single species in 1803, and increased to ninety-five in its fourth monograph, that by Dr. Sereno Watson, in 1870.

In discussing this paper, Dr. Allen contributed an entertaining description of his difficulties in bringing growing specimens of *Eriogonum Alleni* from near White Sulphur Springs to the Botanic Garden here.

Dr. Britton reported that the specimens then secured have done well in cultivation at Bronx Park, and have matured seeds.

Dr. Allen spoke of finding two or three species of *Eriogonum* in the Grand Cañon of the Colorado last summer, and described his descent of the cañon by mule trail, and also his journey to California in search of Characeæ.

Dr. Britton reported two cases of naturalization of escapes from greenhouses; the first that of a creeping form of *Ovalis corniculata*, now becoming a noxious weed at Whitestone, L. I.

The second case is that of a fern, apparently an Asplenium from a temperate habitat.

Other cases of fern naturalization which have been previously reported include that of an Adiantum in Rhode Island, by Mr. Davenport, and a Pteris in a rock-cut near the New York Central Railroad tunnel in our own city, noted by Mr. W. A. Clute.

Edward S. Burgess,
Secretary.

SCIENTIFIC JOURNALS.

American Chemical Journal, December. 'Decomposition of Heptane and Octane at High Temperatures,' by R. A. Worstall and A. W. Burwell: A study of the decomposition of these substances when heated in the Pintsch gas plant. The chief products of the decomposition are the olefines, methane, acetylene and the aromatic hydrocarbons. All hydrocarbons, under the same conditions of temperature, seem to yield the same products. 'Anethol and Its Isomers,' by W. R. Orndorff, G. L. Terrasse and D. A. Morton: Preparation and study of properties and molecular weight of nine isomeric substances. 'Action of Sulphur on Silicides, Production of Silicon,' by G. de Chalmot: Conditions under which the silicon is replaced by sulphur. 'Acetylene Diiodide,' by G. de Chalmot. 'The Action of Sodium upon Methylpropylketone and Acetophenone,' by Paul C. Freer and A. Lachman. 'Solubility of Lead in Ammonia,' by H. Endemann. 'The Decomposition of Sulphonic Ethers by Water, Acids and Salts,' by J. H. Kastle, Paul Murrill and J. C. Frazer: A study of the rate of decomposition. 'A Study of Zinc Hydroxide in Precipitation,' by V. J. Hall: Effect of chlorides and sulphates on the precipitation.

J. Elliott Gilpin.

NEW BOOKS.

Repetitorium der Chemie. C. Arnold. Eighth edition. Revised and enlarged. Hamburg and Leipzig, Leopold Voss. 1898. Pp. xii+616.

Les végétaux et les milieux cosmiques. J. Costantin. Paris, Alcan. 1898. Pp. 292. 6 fr.

Suggestions for Laboratory and Field Work in High School Geology. Ralph S. Tarr. New York and London, The Macmillan Co. Pp. 100.

Memory and its Cultivation. F. W. Edridge-Green. New York, D. Appleton & Co. 1897. Pp. 311.