white colonies. The bacterium liquefies gelatin, gives an alkaline reaction in litmus milk and produces no gas in fermentation tubes containing peptone-water and 1 per cent. solutions of diffused sugars.

The organism is not killed when kept at a temperature of —2° C. for six days. It grows best on agar at about 25° C., and its thermal death point, found by exposing ten minutes in nutrient solution, is between 49° C. and 50° C.

The bacterium is pathogenic on the leaves of sweet pea, lettuce, pepper and sugar-beet and on the leaves and pods of the bean.

Decay of Potatoes Due to Rhizopus nigricans: W. A. Orton, U. S. Department of Agriculture, Washington, D. C.

A study has been made by the Bureau of Plant Industry of potato diseases in the peat lands of San Joaquin County, Cal.

The most prevalent form of decay is a rapid soft rot, caused by *Rhizopus nigricans* Ehrdt. This is characterized by a dull-brown discoloration of the outer skin and a slight brown discoloration of the flesh, which when cut open soon oxidizes to a reddish-brown. The tissue becomes soft, owing to a solution of the cell walls, and on squeezing there is liberated an abundance of clear brown liquid. This feature has given the disease the local name of "leak" or "melters." There is no bad odor until the invasion of secondary saprophytes.

The large, hyaline, non-septate hyphæ of the fungus are abundant in the tissue. No other organism occurs in the typical "leak." Pure cultures are readily obtained, and a similar decay may be produced by inoculation of sterile raw potatoes under suitable conditions of temperature and moisture. Differences were observed in the rate of decay produced by *Rhizopus* from different sources, that from potatoes producing decay in potatoes sooner than a culture from bread.

Rhizopus nigricans is a wound parasite, capable of affecting potatoes only through abrasions of the epidermis. It appears to spread most rapidly during the "sweat" following the digging of early potatoes in warm weather and gives no trouble after frost comes.

The same fungus causes a destructive rot of sweet potatoes, and will quickly liquefy apples and pears. *Rhizopus necans* Mass., a related species, causes a decay of lily bulbs in Japan.

Some Devices to Facilitate Work in Plant Pathology: E. Mead Wilcox, University of Nebraska, Lincoln, Nebraska.

The method recommended in this paper is, in brief, to arrange all of the material used in pathology work according to one method. It has been found very useful to arrange lantern slides, negatives, index cards, herbarium material and publications alphabetically by the scientific name of the diseased plant, with sub-headings for the several diseases. The herbarium specimens are kept in the ordinary envelopes, which are attached to cards arranged behind guide cards in a vertical file case. The color of the card indicates the part of the plant which is diseased. For example, on the green card would appear specimens of leaf disease, etc. The publications bearing on plant pathology are gathered together and bound by subjects; this necessitates in many cases the partial destruction of a larger publication containing articles on several subjects, but the result is a compact mass of literature on one subject.

The following papers were read by title:

The Spraying of Cedars for "Cedar Apples": F. D. Heald, University of Texas, Austin, Tex.

A Fusarium Disease of the Pansy: Frederick A. Wolf, University of Texas, Austin, Tex.

Studies in Sclerotinia; Sclerotinia fructigena (Pers.) Schröt.: J. M. Reade, University of Georgia, Athens, Ga.

Experiments in the Production of an Anthracnose Resistant Clover: S. M. Bain and S. H. Essary, University of Tennessee, Knoxville, Tenn.

Two Interesting Smuts: L. H. Pammel, Iowa Agricultural College, Ames, Ia.

Henry C. Cowles,

SOCIETIES AND ACADEMIES

THE NEW YORK ACADEMY OF SCIENCES
SECTION OF BIOLOGY

A regular meeting of the section was held at the American Museum of Natural History, on March 8, 1909. In the absence of the chairman, Professor Bashford Dean presided for the evening. The following papers were read:

Genetic Relations of the Insectivora to other Orders of Mammals: Mr. W. K. Gregory.

The Harpswell Biological Laboratory: Mr. Max Morse.

The speaker showed a series of slides illustrating the Harpswell region and environs. The laboratory was founded by Dr. J. S. Kingsley in 1898 in the little fishing village of South Harpswell, Maine, eighteen miles from Portland. The immediate region is rich in interesting forms of

animal and plant life which are peculiarly adapted to the use of the investigator. The laboratory offers no courses of instruction, being solely for the use of investigators. The old Tide-mill collecting ground and samples of some of the more important animals and plants to be found there, were illustrated. The geology of the Harpswell region has not been worked up and this presents interesting questions, especially in glacial geology. The speaker pointed out the advantages offered by the laboratory over those of our other marine stations.

Early Developmental Stages in Recent and Fossil Corals: Professor A. W. GRABAU.

Paleozoic corals show in their septal development a fundamental tetrameral plan. This is persistent in the earliest known forms, but becomes masked in later species by the secondary assumption of radiality. The development of mesenteries of modern Hexacoralla shows a similar order of appearance. Pairs of mesenteries develop in succession in bilateral disposition. From the position of the muscle strands they are either *dorsads* (musculature turned dorsal-ward) or *ventrads*. The first and second pairs are ventrads. The third (ventral directive) is a pair of dorsads, the fourth (dorsal directive) a pair of ventrads. The fifth and sixth pairs are dorsads forming with the first and second pairs four false pairs of "braces." After that the mesenteries appear in compound pairs, a pair of dorsads and one of ventrads appearing simultaneously. Thus in the corresponding inter-mesenterial spaces a *brace* of new mesenteries appears, the order being comparable even in detail to the order of appearance of the septa in the Paleozoic Tetracoralla.

A REGULAR meeting of the section was held at the American Museum of Natural History, on April 12, 1909. In the absence of Mr. Frank M. Chapman, chairman of the section, Professor Chas. L. Bristol presided. The following papers were read:

Final Report on the Exploration of the Fayûm in 1907: Professor HENRY F. OSBORN.

In the absence of Professor Osborn, this report was given by Mr. Walter Granger, of the American Museum of Natural History. The speaker stated that the collection obtained by the expedition has been prepared and proves to contain representatives of nearly all of the mammalian forms known from this region, together with several new genera and many species. Among the new forms are rodents, recorded for the first time from these beds, and two peculiar small forms of uncertain ordinal positions. The collection contains many fine specimens of described species which add much to the previous knowledge of these interesting mammals. Doubt was expressed as to the relationships of the genus *Megalohyrax* to the Hyracoidea and *Mœritherium* to the Proboscidia. The speaker stated that the collection of 1907 is being increased through the efforts of a representative maintained in the Fayûm.

By chart and slides the geology of the region was illustrated, also the important topographic features and the method employed in prospecting and collecting the fossils.

Studies on Tissue Growth: Dr. CHAS. R. STOCKARD.

The Partulas of the Society Islands and the Problem of Isolation: Professor HENRY E. CRAMPTON.

The speaker presented some of the general results obtained during investigations in 1906, 1907 and 1908, dealing with the variations and distribution of terrestrial snails of the genus *Partula*, inhabiting the Society Islands. The geographical and physiographical conditions were described. The islands of this group are volcanic peaks of a partially submerged range; these peaks occur sometimes in contact, as in the double island of Tahiti, while others have greater or lesser distances between them. It is, therefore, possible to correlate the specific differences between the snails of different cones with the geographical proximity of the cones. As each island peak is furrowed more or less regularly by valleys and as the snails occur only in the moist bottomlands of these valleys, it is possible to correlate the degree of resemblance between the species of neighboring valleys with the degree of geographical isolation. In brief, such correlations are extraordinarily close, as in the case of the classic Achatinellidæ of the Hawaiian Islands described by Gulick.

The varieties of snails growing in different valleys of one and the same island, or in different islands of the group, can not be regarded as produced in different environmental circumstances. Several illustrations were given which established this conclusion. The phenomena of mutation were observed in several islands. Finally the rôle of natural selection was determined to be a much restricted one in the case of these snails.

L. HUSSAKOF,
Secretary

AMERICAN MUSEUM OF
NATURAL HISTORY

THE ELISHA MITCHELL SCIENTIFIC SOCIETY OF THE UNIVERSITY OF NORTH CAROLINA

THE 183d meeting of the society was held in Chemistry Hall, Tuesday, April 1909, at 7:30 P.M. The following papers were presented:

"The Linear Classification of the Cubic Surface," by Professor Archibald Henderson.

"Trichlorethylidenediphenamine Compounds," by Professor Alvin S. Wheeler.

ALVIN S. WHEELER,
Recording Secretary

THE AMERICAN CHEMICAL SOCIETY. NORTHEASTERN SECTION

THE ninety-second regular meeting of the section was held at the Twentieth Century Club, Boston, on April 8. Professor W. D. Bancroft, of Cornell University, addressed the section upon "The Reversal of the Photographic Image." The speaker advanced a new theory to account for the appearance of a positive and of a second negative upon the development of over-exposed photographic plates, and showed how, by the aid of this theory, many obscure phenomena connected with reversal are capable of a simple explanation. Dr. H. W. Morse, of Harvard University, addressed the section upon "Some New Methods of Nitric Acid Manufacture." After describing the method of synthesis used in Norway, the speaker discussed in detail the "Ostwald Process" for the oxidation of ammonia to nitric acid by the air with platinum foil as the catalyzer.

KENNETH L. MARK,
Secretary

THE SCIENTIFIC SOCIETY OF NORTH DAKOTA

IN October of last year a general scientific society was organized with headquarters at the North Dakota Agricultural College and Experiment Station. Administration officers are as follows:

President—J. H. Shepperd, dean of agriculture.

First Vice-president—Linwood A. Brown, professor of pharmacy.

Second Vice-president—H. L. Bolley, professor of biology.

Secretary—Roe E. Remington, instructor in food chemistry.

The society meets fortnightly, and the following papers have been presented:

October 7—"Fixation of Nitrogen," Roe E. Remington.

October 21—"Weed Eradication by Means of Chemical Sprays," H. L. Bolley.

November 4—"The Geology of the Stump Lake Region," D. E. Willard.

November 18—"The Relation of some Recently Formulated Biological Principles to Plant Breeding," O. O. Churchill.

December 2—"Some Engineering Problems Connected with Water Filtration," R. H. Slocum.

December 16—"The Sanitary and Bacteriological Purification of Water," T. D. Beckwith.

January 13—"Some New Productions in Plant Life," J. H. Shepperd.

January 27—"Denatured Alcohol, Manufacture and Uses," Grant J. Morton.

February 10—"Darwin and after Darwin," C. B. Waldron.

February 24—"Birds of North Dakota," W. B. Bell.

March 10—"Studies on Soil Toxins," J. W. Ince.

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON

A SPECIAL meeting of the society was held on Tuesday, April 27, 1909, President Fewkes in the chair. The program consisted of a paper by Miss Frances Densmore entitled "The Study of Indian Music" based upon her own recent investigations among the Chippewa of Minnesota. She stated that the object of this study was to find by analysis what constitutes Indian song and musical performance and to make the results of the study available and clear to those who are not musicians but who are interested in the genuine progress of science. Her method of procedure is to make phonograph records of Indian songs, transcribe these, analyze both record and transcription, and tabulate the analyses in accordance with a definite system. Among the interesting results of this work Miss Densmore mentioned the fact that some songs were found to be melodic and some to be harmonic in structure, and also that the rhythm was most peculiar in songs intended to exert a mental influence such as "medicine" songs, certain Mide songs, and also songs intended to incite to war. The paper was illustrated by means of phonograph records and vocal selections to the accompaniment of a drum and the piano. An interesting discussion followed.

JOHN R. SWANTON,
Secretary