sarily separate it from the glacial deposited beds, although it points to such a separation.

If it is wind-blown sand, then the reddish layer between it and the cross-bedded sand and gravel probably represents the upper surface of the Trenton gravel and was the terrace surface during the interval between the accumulation of the glacial gravel and the wind-blown sand. This layer was examined very carefully in the hope of finding proof of its being an old soil. No humus staining, however, was observed, and its absence may be an argument against the view here advanced. It is not a fatal objection, however, since its absence can be satisfactorily explained by the oxidation and leaching which the whole mass has undergone. This action is still going on, for the humus staining is being leached out of the underside of the present soil, as is indicated by its mottled appearance through a zone five or six inches thick.

4. The presence of at least one wind-eroded pebble in the sand lends some strength to this interpretation, although in the light of the studies of Davis and Woodworth on Cape Cod it cannot be regarded as conclusive.

The presence of scattered pebbles in the sand, too large to have been moved by the wind, may at first sight seem to be fatal to this view, but when all the facts are considered it is not so. That man was present is indicated by the artifacts found. The bank from which the pebbles may have been carried by human agencies is hardly more than a hundred feet away. Although the presence of the pebbles may, to some degree, weaken the argument it is not fatal to it.

My conclusions are, therefore, that the artifacts are probably found *in situ*. There is no positive evidence that the sand deposit is water-laid, and there are strong reasons, although perhaps not conclusive, that it is wind-blown. In the latter case it may date from a period much later than the accumulation of the Trenton gravel. It seems most reasonable to suppose that it had accumulated after the river had cut its channel somewhat below the level of the terrace and formed a freehly-cut bluff, from which the sand was derived. The localization of the sand along the present bluff and the reported greater abundance of the artifacts in the sand nearest the bluff supports this conclusion.

Substantially these same conclusions were reached by me at the time of my first visit to this locality, and my later observations served only to confirm them. In a letter to Professor Mercer, written about July 1st, I stated this view as to the origin of the sand, and the same conclusions were expressed to Professor Smock even earlier. Ever since my first visit to this locality I have been of the opinion that these deposits are probably æolian and that they certainly do not represent the closing stages of the Trenton gravel.

HENRY B. KÜMMEL.

LEWIS INSTITUTE, October 25, 1897.

SOCIETY FOR PLANT MORPHOLOGY AND PHYSIOLOGY.

THE first meeting of this Society was held in conjunction with the meeting of the American Society of Naturalists and the Affiliated Societies at Sage College, Cornell University, December 28 and 29, 1897. The following papers were presented:

1. *A Mycorhiza in the Roots of the Liliaceous Genus Philesia.* DR. J. M. MACFARLANE, University of Pennsylvania.

A NEW case of this kind of Symbiosis was fully described and the conclusion reached that while the fungus might for many generations aid the host in the elaboration of protein compounds, ultimately though very gradually the fungus proved a destructive agent.

2. *Studies on some Mycelium, and Fungi from a Coal Mine* (illustrated by lantern views). PROFESSOR G. F. ATKINSON, Cornell University.

THE author described and illustrated by lantern views the remarkable developments of mycelia on the wooden beams, etc., of an abandoned part of a coal mine near Wilkesbarre, Pa. He photographed these by flashlight, and found fruiting specimens by which several of the species were determined.

3. *Is there Basidiomycetous Stage in the Life-History of some Ascomycetes?* DR. E. A. BURT, Middlebury College.

THE author has been unable, by the study of collections made in August, October, November, December, to confirm Massee's observations on the basidiomycetous nature of *Dacryopsis Ellisiana* and, therefore, is unable at present to conclude with Massee that *D. Ellisiana* is a basidiomycetous stage of the Ascomycete *Lecanidion leptosperma*.

4. *Additional Notes on the Bacterial Brown Rot of Cabbages.* DR. ERWIN F. SMITH, Department of Agriculture.

ADDITIONAL studies by the author have shown how the disease is disseminated, how the infections take place, how it persists in localities where it has once appeared, its host plants and how it may be restricted. An account of the economic aspects of the disease has been published by the Department of Agriculture as a Farmers' Bulletin.

5. *Occurrence of Kramer's Bacterial Disease on Sugar Beets in the United States.* DR. ERWIN F. SMITH, Department of Agriculture.

THIS paper calls attention to the existence, in parts of the United States, of a disease of sugar beets resembling, if not identical with, that described by Kramer and Sorauer in 1891–1892, and more recently by Busse. The characteristics of the disease were described.

6. *Are Blepharoplasts Distinct from Centrosomes?* MR. HERBERT J. WEBBER, Department of Agriculture.

BLEPHAROPLASTS, the speaker pointed out, are special organs of the spermatic cells of Zamia, Gingko and some Filicineæ and Equisetineæ, which in certain stages of their development somewhat resemble centrosomes. Two are formed in each generative cell, arising *de novo* in the cytoplasm on opposite sides of the nucleus and about midway between the nuclear membrane and cell wall. The division of the generative cell results in the formation of two antherozoids, one blepharoplast being located in each antherozoid cell. During the division the blepharoplasts burst and the outer membrane becomes gradually extended into a narrow helicoid spiral band from which the motile cilia of the antherozoid are developed.

The blepharoplasts resemble typical centrosomes: (1) in position, being located on the opposite side of the nucleus, and (2), in having the kinoplasmic filaments focused upon them during the prophases of the division of the generative cell. They differ from typical centrosomes, however: (1) in arising *de novo* in the cytoplasm; (2) in growing to comparatively enormous size; (3) in not forming the center of an aster at the pole of the spindle during mitosis; (4) in having a differentiated external membrane and contents; (5) in bursting and growing into a greatly extended cilia-bearing band, the formation of which is evidently their primary function; (6) in their non-continuity from cell to cell.

7. *Spore Formation in some Sporangia.* DR. R. A. HARPER, Lake Forest University.

THIS paper described the homologies in the modes of spore formation in a number of Sporangia.

8. *Two New Organs of the Plant Cell.* MR. WALTER T. SWINGLE, Department of Agriculture.

THE author announced the finding of two new organs or organoids; the one, *Vibrioid*, occurring abundantly in the superficial layers of the protoplasm of some Saprolegniaceæ and Florideæ, and the other a central body in the developing egg of *Albugo candidus*. Both have been observed before but not correctly described. Both are fully described in this paper. The author can suggest nothing as to the function of the former, but thinks the latter plays some part in the delimitation of the egg within the oögonium, and the fusion of the male and female nuclei.

9. *Notes on the Archesporium and Nucleus of Bignonia.* MR. B. M. DUGGAR, Cornell University.

THE author gives a detailed account of his observations on the microsporic and macrosporic archesporium in this genus. The archesporial nucleus is peculiar in possessing a large nucleolar-like structure which does not stain homogeneously.

10. *Some Theories of Heredity and of the Origin of Species Considered in Relation to the Phenomena of Hybridization.* MR. WALTER T. SWINGLE, Department of Agriculture.

OWING to limited time, Mr. Swingle treated only the part of his subject which relates to facts of hybridization and their bearing on theories of heredity. He cited facts from his own observations and from the literature which cannot be explained by Weismann's theory of reduction of the chromosomes. He considers it necessary to assume, in some cases at least, a predetermination of the characters of the hybrid at the time of the fusion of the male and female nuclei. The male and female chromosomes probably persist side by side unchanged in number, and possibly unchanged in quality, during the whole of the ontogeny of the hybrid. It is also necessary to assume that the influence exerted during ontogeny of the hybrid by the material bearers of heredity is, at least in some cases, a function of their relative positions. Xenia is well established and, together with cases where the mother-plant influences the developing embryo, is inexplicable by most of the current theories of heredity, and necessitates the assumption that hereditary influences can be transported from cell to cell for some distance.

11. *Variable Reaction of Plants and Animals to Hydrocyanic Acid Gas.* MR. ALBERT F. WOODS, Department of Agriculture.

PLANTS of various families and in different stages of growth were subjected to varying amounts of hydrocyanic acid gas, and were found to be affected by it in different degrees, according to the kind of plant, its age, and other conditions of growth and development. Animals, mainly insects, were also found to vary, even within the same family, in like manner. Mites were the most resistant of any of the organisms studied, often recovering after several hours of complete paralysis and apparent death.

12. *Effect of Alternating Dryness and Moisture on the Germination of some Seeds.* MR. A. J. PIETERS, Department of Agriculture.

THE experiments recorded are preliminary to more extensive ones now in progress, but they show clearly that for some seeds germination is quickened by thorough drying after a long period of dampness. In most cases after a small percentage of germination for the first one hundred days or more, drying for two weeks followed by wetting resulted in a germination of from 15 to 54 per cent. in a few days. In the check pots, meanwhile, the seeds either did not germinate or only a small per cent. did so.

13. *Experiments on the Morphology of Arisæma triphyllum.* PROFESSOR G. F. ATKINSON, Cornell University.

THE author described his experiments by

which he had been able, by growing male and neuter plants of this species in rich soil, to change them to female plants, and by removing a part of the stored food supply of female plants to change them to male.

14. *On Polyembryony and its Morphology in Opuntia vulgaris, Mill.* DR. W. F. GANONG, Smith College.

THE author has found this species to be polyembryonic, with a double morphological basis; one set of embryos develops from a mass of tissue which he believes to arise from the fertilized egg-cell, while the other arises on the walls of the embryo-sac, but not from the nucellus, but probably from an endosperm cell, which, if true, is a new mode.

15. *Contributions to the Morphology and Biology of the Cactaceæ.* Part II., *The Comparative Morphology of the Embryos and Seedlings.* DR. W. F. GANONG, Smith College.

THIS paper is a continuation of the author's earlier studies on this family. It describes and figures germinated embryos of most of the genera and many important species, discusses germination and growth of the seedlings and the unfolding of the peculiar morphological features of the adults, together with the form, size and color factors of the embryos and seedlings, and what these show of importance for the determination of the phylogeny of the genera.

16. *The Morphological Significance of the Lodicules of Grasses.* DR. W. W. ROWLEE, Cornell University.

A STUDY of the flowers of Bamboos leads to the conclusion that the lodicules of grasses represent a reduced perianth. The three lodicules in *Arundinaria* alternate with the stamens, and may, therefore, be considered the inner whorl or petals. The stamens are directly opposite the midribs of the carpels, and indicate that the inner whorl of stamens, present in some bamboos, is suppressed in *Arundinaria*. Hackel interpreted the lodicules as distichous bracts.

17. *Observations on the American Squaw-root (Conopholis Americana, Wallr.).* DR. LUCY L. W. WILSON, Philadelphia.

THIS paper contained an exhaustive study of the vegetative characteristics of this parasite and of its relations to its invariable host, the Oak. Because of its extreme degradation and the intimacy of its relation with the host, the author compared it with members of the Balanophoreæ and Rafflesiaceæ rather than with parasitic Scropulariaceæ.

18. *Water Storage and Conduction in Senecio præcox, DC., from Mexico.* DR. JOHN W. HARSHBERGER, University of Pennsylvania.

THIS species, inhabiting volcanic beds in the Valley of Mexico, shows a remarkable method of storing water in the pith, and prevents its too rapid loss in the dry season by protective layers of cork and balsam. The water is conducted to the vegetative points by bundles which project into the pith. The histological characters are fully described.

19. *Notes on the Embryology of Potamogeton.* MR. K. M. WIEGAND, Cornell University.

THE author had studied the origin and development of the embryo-sac, fertilization and development of the embryo in this species. Although the normal number of cells is present in the egg-apparatus and the antipodals they form irregularly. Of particular interest is the fact that the definitive nucleus cuts off a very large basal nucleus, as in Sagittaria, before endosperm formation proceeds.

20. *Recent Experiments and Observations on Fruit-Production in Amphicarpœa.* DR. ADELINE SCHIVELY, Philadelphia Normal School.

THIS paper continues the author's recently published observations on this subject, and

she now shows that aërial flowers, when buried at any period before fertilization, produce the underground kind of fruit, and not the kind they would have produced in their normal position, from which the author draws conclusions as to the very powerful action of the environment upon seed production and structure in this species.

21. *On the Formation of Cork Tissue in Roots of the Rosaceæ.* DR. MARTHA BUNTING, Philadelphia High School.

THE author showed that intercellular spaces exist between the cork cells in all herbaceous and shrubby species of Rosaceæ examined by her, but these are absent in arborescent species; protoplasm, nuclei and starch grains exist in cork zones four to five layers removed from the phellogen.

22. *The Structure and Development of Internal Phloem in Gelsemium sempervirens, Ait.* MISS CAROLINE THOMPSON, University of Pennsylvania.

THE mode of formation of the internal phloem in the pith of this species, and the way in which it crowds out the pith in its growth, together with a remarkable arrangement of the bundles in the petiole, are fully described.

The officers for the ensuing year are: President, W. G. Farlow; Vice-Presidents, J. M. Macfarlane, G. F. Atkinson; Secretary-Treasurer, W. F. Ganong.

The next meeting of this Society will be held in December, 1898, in conjunction with the American Society of Naturalists and the Affiliated Societies.

W. F. GANONG,
Secretary.

REPORT OF THE COMMITTEE ON ANTARCTIC EXPLORATION.

AT the Philadelphia meeting of the American Society of Naturalists, held in December, 1895, a committee was appointed to inquire into the practicability and feasibility of the exploration of the Antarctic Continent. This committee made a report to the Society, which was published in the 'Records' of the meeting of 1896, and the committee was continued, with power to add to its number. The following report was received by the Secretary too late to be presented at the recent Ithaca meeting.

H. C. BUMPUS,
Secretary.

Your Committee on Antarctic Exploration respectfully report that they have further considered the subject-matter which was referred to them, but regret that they are still not in a position to give assuring indications as a result of their inquiries. The seeming impossibility of obtaining a suitable vessel and sailing crew in any of the southern South American ports, and the non-willingness of the Newfoundland fishing and whaling interests to associate themselves with so distant enterprises as would be involved in any form of Antarctic exploration, complicate the problem very materially, or, at least, set so high an estimate upon general costs as to make the realization of an expedition at a period of financial depression somewhat of an uncertainty. It has been found impossible to ascertain what form of assistance might be obtained from the Australian whaling fleets, but the letter which was addressed to your Committee by the late Baron Ferdinand von Müller intimates that little assistance of any kind should be relied upon to come from that quarter.

Your Committee have been in correspondence with Civil Engineer Robert E. Peary, relative to the subject of the inquiry, and have obtained through him valuable data bearing upon general costs and possibilities, notably in a series of estimates that were submitted to him by Mr. H. J. Bull, of Christiania, Norway, intended to cover one or more joint commercial (whaling) and scientific enterprises, and to yield a