The incomplete nuclear divisions, which begin in the young tapetum, result in the formation of nuclei of irregular form, commonly, dumb-bell and kidney-shaped, which have suggested to some workers that the nuclei divide amitotically. The nuclei, as a result of successive incomplete divisions, are polyploid and of unusually large size.

The organization of chromosomes, the presence of spindle fibers and various stages in the reorganization of the resting daughter nuclei are some of the evidences that incomplete divisions, and not amitotic divisions, occur in the tapetum.

The incomplete nuclear divisions herein described have been studied in two *eusporangiate* ferns, namely *Botrychium virginianum* (L.) Swarz and *Ophioglossum vulgatum* L.

A detailed discussion of these nuclear divisions in the tapetum of the ferns studied will be presented in the near future.

W. N. STEIL

MARQUETTE UNIVERSITY

THE FOURTEENTH ANNUAL MEETING OF THE AMERICAN GEOPHYSICAL UNION

THE fourteenth annual meeting of the American Geophysical Union and the sessions of its sections were held at Washington, D. C., on April 27, 28 and 29.

Progress-reports on geodetic work in the United States and Mexico were presented before the Section of Geodesy, as also papers on gravity-work, on application of radio to astronomical longitude-determinations of the Geodetic Survey of Canada, on the moon's influence on latitude and on the expansion and developments in the time-service at the U. S. Naval Observatory.

The Section of Seismology of the union held a joint meeting with the Eastern Section of the Seismological Society of America. An interesting series of progress-reports, papers and informal communications, totaling 39, was presented at the three sessions of this joint meeting, including, among others, progress-reports on developments of seismological instruments and on the work of various seismograph-stations in the United States and Mexico; papers relating to recent earthquakes, to discussion of methods in seismological determinations, and to precise geodetic measurements and their relation to seismological investigations; and an informal discussion of earthquake-code.

At its meeting the Section of Meteorology had the privilege of hearing a paper by Dr. L. Vegard, of Norway, on the auroral spectrum, in addition to papers by members of the union and other guests on meteorological problems in relation to radiation, on trade-winds of the eastern Caribbean, on reduction of meteorological data from Cruise VII of the *Carnegie,* on interesting facts concerning warm and cold waves, on the value of cloud-observations, on the Giao theory explaining the formation of precipitation in relation to fundamental concepts of the polar-front theory, on turbulence-factors of Linke and Ångstrom and their practical applicability, and on the time, type and areal distribution of tornadoes in the United States.

The reports and papers presented before the Section of Terrestrial Magnetism and Electricity included progress-reports on the year's investigations and projects in the United States, Canada and Mexico and on the International Polar Year of 1932–33, while the papers related to cosmic rays, to earth-resistivity measurements, to ozone and the sunspot-cycle, to cosmic radio correlations and to effect of magnetic activity upon secular change.

As in past years, the meeting of the Section of Oceanography consisted mainly of the progress-reports of eight governmental bureaus and private research organizations engaged in oceanographic work in the United States and Canada. Besides these reports, there were papers on the submarine valleys of the Bahamas, on submarine mock valleys, on investigations of submarine valleys, on monthly sequence of sea-surface temperature on the New York-San Juan steamship route, on air- and water-temperatures in the West Indian region, on development of our conception of the Gulf Stream system and on data from borehole on New Providence Island, Bahamas.

In the Section of Volcanology the papers dealt with volcanic explosions and overthrusts, with the Tertiary Volcano at Cripple Creek, Colorado, and the volcano of Santa Maria in Guatemala, with some features of volcanic sequence in the Cascade Region in Oregon, and with volcanic history of the Magdalena District, New Mexico.

The Section of Hydrology devoted three sessions to hearing reports of its nine permanent research committees and 25 papers covering numerous investigations and developments in scientific hydrology throughout the United States. These brought out clearly the effective cooperation existing between the various hydraulic stations and laboratories of the federal government, of the state governments, of universities and of consulting engineering organizations.

At the business session of the general assembly the general secretary reported a total membership of 355, as of April 28, 1933. Among other things, the gen-

eral secretary also reported briefly on relations of the union with the international body and on the progress of the International Polar Year of 1932–33. His report showed that interest in geophysics during the past year has continued its rapid growth—a growth to which the union has made substantial contribution.

The following nine resolutions were unanimously adopted:

(I) *Resolution on the death of Robert Lee Faris,* proposed by the Sections of Geodesy and Terrestrial Magnetism and Electricity:

WHEREAS, By the death of Robert Lee Faris on October 5, 1932, the American Geophysical Union has lost one of its original members and a former Chairman of the Section of Geodesy, and

WHEREAS, Captain Faris was interested in many departments of geophysics and helped to advance scientific knowledge not only by his personal efforts in field and office, but also by the influence he was able to exert through the numerous and important administrative positions held by him, and not least by means of his personal character, which won for him the respect and friendship of those with whom he came in contact, therefore be it

Resolved, That the American Geophysical Union, in general meeting assembled, hereby expresses and places on record its sense of loss through his death; and be it further

Resolved, That copies of this resolution be sent to Mrs. Faris, to the Director of the U. S. Coast and Geodetic Survey, and to Chairman of the Mississippi River Commission.

(II) *Resolution on the death of John Ripley Freeman,* proposed by the Sections of Seismology and Hydrology:

WHEREAS, In the death of John R. Freeman the American Geophysical Union has lost a pioneer in the fields of hydrology, geology, and seismology as related to engineering problems, and

WHEREAS, He has rendered notable services to his profession by his generosity in providing traveling scholarships in hydraulics and in financing the translation and publication of foreign books and papers on hydraulics, and by his untiring efforts toward the establishment of a National Hydraulic Laboratory, and

WHEREAS, He through publication and otherwise has greatly stimulated interest in seismology, especially in applications toward saving life and property; therefore be it

Resolved, That the American Geophysical Union expresses its sense of great loss in the death of John R. Freeman, not only because of his high engineering and scientific attainments, but also because of his outstanding personal qualities and his earnest and continuous efforts to advance the profession to which his whole life has brought honor; and be it further

Resolved, That a copy of this resolution be sent to Dr. Freeman's family.

(III) *Resolution on the death of Harlan Wilbur Fisk,* proposed by the Section of Terrestrial Magnetism and Electricity:

WHEREAS, In the death of Harlan Wilbur Fisk the American Geophysical Union has lost a member long identified with the affairs of the Union and active especially, as both member and officer, in the Section of Terrestrial Magnetism and Electricity, and

WHEREAS, He rendered important service to the advancement of geophysics, particularly through his extensive participation in the magnetic survey of the Earth and through the interpretation of the results thus obtained; therefore be it

Resolved, That the American Geophysical Union records this expression of its sense of profound sorrow on the death of Harlan Wilbur Fisk; and be it further

Resolved, That a copy of this resolution be sent to Professor Fisk's family, to the President of the Carnegie Institution of Washington, and to the Acting Director of the Department of Terrestrial Magnetism.

(IV) *Resolution on the death of Louis Winslow Austin,* proposed by the Section of Terrestrial Magnetism and Electricity:

WHEREAS, The death of Louis Winslow Austin has removed from the American Geophysical Union a member always actively interested in the affairs of the Union and one who made notable contribution to geophysics through radio-transmission research and its interpretation in relation to terrestrial magnetism and other geophysical phenomena; therefore be it

Resolved, That the American Geophysical Union records this expression of its sense of great loss in the death of Louis Winslow Austin; and be it further

Resolved, That a copy of this resolution be sent to Dr. Austin's family, to the Secretary of the Department of Commerce of the United States, and to the Director of the United States Bureau of Standards.

(V) *Resolution on International Polar Year,* proposed by the Section of Terrestrial Magnetism and Electricity:

WHEREAS, The American Geophysical Union regards with satisfaction and approval the progress made in carrying out the International Polar Year program and appreciates the great value of the results that have been and will be obtained during the Polar Year; therefore be it

Resolved, That the American Geophysical Union expresses the hope that the International Polar Year Commission will be able to find means for complete analysis, discussion, and distribution of the geophysical data resulting from this magnificent international effort, and that the United States, through its government or otherwise, will be able to assume its proper share in this work; and be it further

Resolved, That copies of this resolution be sent to the President of the International Polar Year Commission and to the President of the National Academy of Sciences with the request that the latter make such disposition of this resolution as he may find most effective.

(VI) *Resolution on cosmic rays,* proposed by the Section of Terrestrial Magnetism and Electricity:

WHEREAS, The importance of studies of cosmic rays is steadily increasing and the need for their continuous registration has been demonstrated; therefore be it

Resolved, That the American Geophysical Union recommends that support wherever possible be given to the plan of the Carnegie Institution of Washington and cooperating agencies to establish at certain fixed observatories apparatus and equipment for recording cosmic rays photographically and continuously; and be it further

Resolved, That a copy of this resolution be sent to the President of the Carnegie Institution of Washington with the request that he furnish copies to the cooperating agencies.

(VII) *Resolutions proposing an International Commission on the Hydrology of Snow and Ice,* proposed by the Section of Hydrology:

WHEREAS, The hydrology of snow and ice and the methods of making snow-surveys constitute an important field in the science of hydrology, with a considerable number of research workers in the subject wisely distributed in different parts of the world, and

WHEREAS, There is at present no international commission that covers this field; therefore be it

Resolved, That the American Geophysical Union hereby expresses the hope that the International Association of Scientific Hydrology will take appropriate steps at the forthcoming meeting in Lisbon to create a Commission on the Hydrology of Snow and Ice; and be it further

Resolved, That a copy of this resolution be sent to the Secretary of the International Association together with copies of the annual reports for 1932 and 1933 of the Committee on Snow of the Section of Hydrology of the American Geophysical Union.

(VIII) *Resolution on appropriations for scientific investigations by the Federal Government,* proposed by the Section of Seismology:

WHEREAS, There are certain types of investigation which can be carried on effectively only by the Federal Government, and

WHEREAS, Large economies accrue to the Government itself from those investigations, and

WHEREAS, Private engineers, geophysicists, and others are almost absolutely dependent on the results of those investigations for the continuance of their own work; therefore be it

Resolved, That the American Geophysical Union expresses its hope that the scientific work of the Federal Government will not be too much curtailed under the stress of economic conditions; and be it further

Resolved, That a copy of this resolution be sent to the President of the National Academy of Sciences for such use as the Academy may think proper in its capacity as official advisor to the Federal Government.

(IX) *Resolution on Naval Observatory time-signals,* proposed by the Section of Seismology:

WHEREAS, Accurate time-signals sent out from a strong radio broadcasting station many times daily are necessary for seismological and other geophysical observations, and

WHEREAS, The United States Naval Observatory is now broadcasting such signals seven times daily; therefore be it

Resolved, That the American Geophysical Union expresses its appreciation and gratitude for this service; and be it further

Resolved, That this resolution be printed in the transactions and that a copy be sent to the Superintendent of the United States Naval Observatory.

The scientific session of the general assembly was devoted to a symposium on relations of hydrology to other branches of geophysics, and included the following papers: (a) "The Relation of Hydrology to the Botanical Sciences," by R. E. Horton; (b) "Relation of Meteorology to Hydrology," by N. C. Grover; (c) "Distribution of Precipitation in the Cumberland and Tennessee Basins," by M. W. Hayes; (d) "Glaciers and Geophysics," by Harry Fielding Reid; (e) "Some Relations between Ground-water Hydrology and Oceanography," by D. G. Thompson; (f) "Oceanography and Hydrology," by G. F. McEwen; (g) "Relation of Seismology to Hydrology," by N. H. Heck; (h) "Geophysical Interpretation of Ground-water Levels," by O. E. Meinzer; (i) "Associated Problems in Hydrology and Terrestrial Electricity," by O. H. Gish.

The marked success of the fourteenth annual meeting of the union and of its sections hinged largely upon the excellent program developed by the committee on meetings, consisting of Messrs. H. A. Marmer (*chairman*), R. M. Field, R. E. Gibson, F. W. Sohon, S.J., and H. F. Johnston.

The manuscript for the planographed volume of the complete *Transactions* of this meeting is already in preparation, and it is hoped that the volume may be issued during July.

JNO. A. FLEMING,
General Secretary

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A MOUTH PIPETTE AND CONTAINERS FOR SMALLER ORGANISMS

A BIOLOGIST frequently encounters choice specimens for microscopic study in such materials as plankton, bottom deposits or mixed cultures of protozoa. But because of the time required to separate the desired forms from the mass of debris by the ordinary means at hand the specimens are usually sacrificed. For the same reason mixed cultures of protozoa are often tolerated. In my investigation of the soft parts of the foraminifera, many thousands of individuals ranging in size from 40 to 500 μ were isolated. In