servations, extending over a period of nearly seven years, of the deformation of the earth under the influence of the moon. The instrument (or instruments, for two were set up) used was a horizontal pendulum, in short a seismograph, placed in a well some eighty feet deep to eliminate the heat effect of the sun. As the theoretical displacement of a pendulum through the attraction of the moon is a definite quantity, readily computed for an absolutely rigid earth, the actual displacement gives a measure of the yielding of the earth itself, *i. e.*, of the degree of rigidity. Hecker's observations confirmed previous determinations made however by different methods, that the rigidity of the earth is somewhat greater than that of steel. The tide of the solid earth is from four to six inches. An interesting point brought out too was, that there is very little lag in this earth tide, *i. e.*, that "high earth" corresponds to the transit of the moon for any place.

Another interesting paper was that of Prince Galitzin on the determination of the azimuth or direction of the epicenter from the comparison of the corresponding amplitudes of two horizontal pendulums at a single station, one mounted in the N.–S., the other in the E.–W. direction. He showed the interagreement of his deduced azimuth for a dozen known earthquake centers with the theoretically computed one.

The method of obtaining the distance to an epicenter has of course for some time been readily available from the time interval between the different phases of an earthquake record; for instance, between the arrival of the first longitudinal waves and the first transverse waves; or the first long waves.

Of any individual question or subject discussed, the one on microseisms elicited the most interest. These microseisms or earth tremors have been observed practically over the whole earth, and are quite distinct from pulsations produced by earthquakes. They last for hours and days, and have a period of about five seconds. The actual amplitude (half range) of the earth particles reaches five microns, or one two-hundredth of a millimeter.

The writer communicated the results of his investigation extending over several years, which shows that they are due in the first instance to areas of low barometer, surrounded by steep gradients, and in the second place, that such an area of low barometer is far more effective in producing microseisms when it is resting or passing over water, that is, the ocean. Experience shows that for the Atlantic coast the microseisms appear more strongly *after* the area of low has passed the recording station and reached the ocean. Per contra, in Europe the reverse should obtain, as in general atmospheric movement between Canada and Europe is easterly, that is, the microseisms there should show themselves *before* the low reaches the land.

A special committee was appointed to further investigate this interesting problem, and to that end it is probable that one or more instruments, especially designed for the purpose, will be set up on the seashore to record the pulsations of the water.

The present mareographs or tide-gauges are not adapted for that purpose, the time-scale being far too small, for one must be able to read at least to five seconds of time on the record. A thousand Marks, or $250, was placed at the disposal of this committee.

The conference was successful in every respect. The members were all housed in the same hotel, and this enhanced the opportunity of "heart to heart" talks which are really the most valuable assets that meetings of scientific men offer.

Otto Klotz

THE GRADUATE SCHOOL OF AGRICULTURE

The fourth session of the Graduate School of Agriculture, which has been in progress for the past four weeks at the Iowa State College at Ames, was brought to a close July 29.

The session was entirely successful from the standpoint of numbers enrolled and character of the lectures given. The total enrollment was 207, in this number 39 states, the

District of Columbia and six foreign countries were represented. This enrollment showed nearly 43 per cent. increase over the previous session in 1908. The number of states represented is very significant of the fact that the American Agricultural Colleges as a whole are coming to realize the benefit of the sessions of the Graduate School to their instructional and experimental staffs and to American Agriculture at large.

The faculty was composed of experts from the United States Department of Agriculture, Agricultural Colleges of the United States and Canada, Biological Departments of several universities, the Carnegie Institution at Washington and from two foreign countries; Dr. J. C. Ewart of the University of Edinburgh, delivered five lectures on Animal Breeding and Dr. Von Tschermak, of the Royal Imperial Agricultural College of Austria, delivered five lectures on Plant Breeding.

Discussions of the latest theories and investigations relating to agricultural development were interesting and very resultful. Men in attendance at this session of the Graduate School have become better acquainted with and have a broader knowledge of the progress of agricultural investigation than ever before. Investigators from the north, south, east and west are now much more united in the problems of agriculture.

W. H. P.

SCIENTIFIC NOTES AND NEWS

DR. JOHN F. ANDERSON has been made director of the Hygienic Laboratory of the U. S. Public Health and Marine Hospital Service to fill the vacancy caused by the removal of Dr. M. J. Rosenau to Harvard University.

PROFESSOR WILLIAM H. WALKER, head of the research laboratory of applied chemistry of the Massachusetts Institute of Technology, has been elected president of the Electrochemical Society.

FOREIGN members of the Royal Society have been elected as follows: Dr. Svante Arrhenius, Dr. Jean Baptiste Édouard Bornet, Dr. Paul Ehrlich, Professor Vito Volterra and Dr. August Weismann.

SIR E. RAY LANKESTER has been elected a foreign associate to the Paris Academy of Sciences to fill the vacancy caused by the death of Robert Koch.

PROFESSOR FILEHNE, the Breslau pharmacologist, has been elected a foreign member of the Paris Academy of Medicine.

THE Steiner prize of the Berlin Academy of Sciences, which is of the value of $1,500, has been awarded to M. Gaston Darboux, of Paris, for his publications in geometry.

THE Astley Cooper Prize has been awarded by the Guys Hospital School to Professor E. Starling, F.R.S.

DR. KARL VON DER MÜHLL, professor of mathematical physics at Basle, has been given the doctorate of laws by that university.

PROFESSOR HENOCH, who for many years was at the head of the department of children's diseases at the Berlin Charité, celebrated the completion of his ninetieth year on July 16.

MR. JOHN RAMSBOTTOM has been appointed assistant in the department of botany of the British Museum of Natural History, where he will devote himself to the fungi.

MESSRS. G. O. SMITH, Waldemar Lindgren, George F. Becker, S. F. Emmons and Whitman Cross will attend the eleventh International Geological Congress at Stockholm from August 18 to 25 as representatives of the U. S. Geological Survey.

AMONG the foreign guests at the recent meeting of the British Medical Association were two Americans, Dr. George Crile, of Western Reserve University, and Dr. R. Tait MacKenzie, of the University of Pennsylvania.

DR. ROSCOE POUND, professor of law in the University of Chicago, known also to students of botany for his contributions to that science, has been selected to deliver the address at the summer convocation of the university. This will mark the close of Dr. Pound's work at Chicago, as he has accepted the offer of a professorship in Harvard University.