

SAUL EPSTEIN AND HEMAN BURR LEONARD: 'On the Definition of Reducible Hypercomplex Number Systems.'

PETER FIELD: 'Quintic Curves for which $P=1$.'

C. L. E. MOORE: 'Classification of the Surfaces of Singularities of the Quadratic Spherical Complex.'

LEONARD EUGENE DICKSON: 'Subgroups of Order a Power of p in the General and Special m -ary Linear Homogeneous Groups in the $GF[p^n]$.'

THE introductory article in the May number of the *American Geologist* is a 'Biographical Sketch,' with portrait, of Benjamin West Frazer by Persifer Frazer. This is followed by Professor N. H. Winchell's article entitled 'Deep Wells as a Source of Water Supply for Minneapolis.' This paper, which is accompanied by several plates, is a presentation of the ever-interesting problem of the water supply of cities. Miss Owen discusses the 'Evidence on the Deposition of Loess.' R. R. Rowley contributes a paper on 'Missouri Paleontology,' which is illustrated by one plate of figures and three new species are described. The concluding article is by Professor Warren Upham on 'Fjords and Hanging Valleys.'

The Museums Journal of Great Britain for May notes that the principal subject for discussion at the coming meeting of the Museums' Association will be 'The Relation of Provincial Museums to National Institutions,' a topic to which American members can contribute little, as here there are no relations, save those of good feeling, each museum being independent of others. Under the head of 'A Notable Gift' is recorded the presentation to the British Museum of the reproduction of the skeleton of *Diplodocus carnegiei*, in the museum at Pittsburgh. Under 'Museum Thefts' is noticed the stealing of some Nelson relics from the Liverpool Museum, primarily due to the fact that a case was left unlocked for some months. Apparently English museums do not suffer from the petty thefts of 'relic seekers' who, in our own museums, take articles of little intrinsic but considerable scientific value, thus doing very considerable damage.

The American Museum Journal for April is called the *Brontosaurus* number, its principal topic being 'The Mounted Skeleton of *Brontosaurus*' recently placed on exhibition. Dr. Matthew tells how this skeleton was obtained, transported and mounted, and discusses the habits and habitat of this enormous brute as indicated by the bones. The two new bird groups, the flamingos and the bird life of the San Joaquin valley are also described and illustrated by full-page plates.

The Popular Science Monthly contains the following articles:

July.

PROFESSOR W. E. CASTLE: 'Recent Discoveries in Heredity and their Bearing on Animal Breeding.'

PROFESSOR J. LAWRENCE LAUGHLIN: 'Present Monetary Problems.'

H. TAYLOR EDWARDS: 'The Vegetable Fibers of the Philippine Islands.'

DR. GUSTAVE MICHAUD: 'The Climate of the Central American Plateau.'

PROFESSOR A. E. DOLBEAR: 'The Science Problems of the Twentieth Century.'

DR. HENRY RUTGERS MARSHALL: 'Human and other Forms of Consciousness.'

PROFESSOR ARTHUR A. NOYES: 'The Preparation and Properties of Colloidal Mixtures.'

August.

PROFESSOR CHARLES DILLON FERRINE: 'An Eclipse Observer's Experiences in Sumatra.'

PROFESSOR JOHN M. COULTER: 'Public Interest in Research.'

JOHN F. CARGILL: 'The Value of Old Age.'

PROFESSOR GEORGE T. LADD: 'A Suggestive Case of Nerve-anastomosis.'

PROFESSOR HUGO DE VRIES: 'A Visit to Luther Burbank.'

PRESIDENT WALTER NGON FONG: 'Some Phases of the Educational Problem in China.'

PRESIDENT KENYON L. BUTTERFIELD: 'The Social Phase of Agricultural Education.'

DR. W. H. MAXWELL: 'Education for Efficiency.' 'President Roosevelt's Address before the National Educational Association.'

SOCIETIES AND ACADEMIES.

THE OREGON STATE ACADEMY OF SCIENCES.

THE need of some general scientific organization has for a number of years been keenly felt by a number of teachers of science and

investigators in Oregon, who, by reason of their great distance from the scientific centers, are unable to attend the annual scientific convocations and congresses. Many other persons, also, who are not engaged professionally in scientific work have realized the need of organized effort in the interest of the development of the scientific resources of the state. In response to this spirit a call was issued by Mr. Edmund P. Sheldon, upon consultation with others, for a meeting to be held February 4, 1905, in the rooms of the John Burroughs Club, Portland.

At this meeting about thirty persons were present. Mr. Edmund P. Sheldon was elected temporary chairman; Dr. Drake, secretary. Plans of organization were discussed and a committee was appointed to draw up constitution and by-laws for an academy of science. Upon this committee were appointed Professor G. E. Coghill, Pacific University, chairman; Professor A. R. Sweetser, State University; Messrs. M. W. Gorman, Schmidt and Ross Nicholas, of Portland. A committee was appointed, also, to confer with the Lewis and Clark Centennial Exposition Commission with regard to arranging for a scientific congress in connection with the Lewis and Clark Centennial Exposition.

Following the business session a paper upon 'The Bacteriology of Water' was presented by Professor A. R. Sweetser. The paper included an account of the author's investigation of the water supply of certain cities and towns of the Willamette Valley. Special attention was given to the water supply of Portland, which was found to be exceptionally free from liability to bacterial contamination. A device for conveying specimens of water long distances at low temperature for bacteriological examination was exhibited and discussed.

The second meeting for organization was held February 18, Mr. Sheldon presiding; Professor C. E. Bradley, secretary. Constitution and by-laws were adopted, and the organization was formally completed under the name of 'The Oregon State Academy of Sciences.' The following officers were elected:

President—Edmund P. Sheldon, superintendent of forestry, fish and game, Lewis and Clark Exposition Commission.

Vice-Presidents—A. R. Sweetser, professor of biology, University of Oregon; A. B. Cordley, biologist of the Oregon Agricultural College; Catherine McConnell, teacher of chemistry and physiology, Portland High School.

Recording Secretary—J. A. Lyman, professor of chemistry, Portland Academy.

Corresponding Secretary—G. E. Coghill, professor of biology, Pacific University.

Treasurer—M. W. Gorman, botanist, Portland.

Librarian and Director of Museum—L. L. Hawkins, capitalist, Portland.

Trustees—L. L. Hawkins; Dr. James Withycombe, director of the experiment station of the Oregon Agricultural College; Edward A. Beals, U. S. Weather Bureau, Portland.

The constitution provides for monthly meetings, and for special meetings which will no doubt be held annually with a view to calling together the scientists of the northwest.

Two of the regular meetings have already been held. On March 18 a paper was presented by G. E. Coghill on 'The Taste Organs of Vertebrates.' On April 18 Mr. Edmund P. Sheldon read a paper on 'Forestry in the United States.' The paper considered the methods and aims of the forester, the significance of forestry to the nation, and to the state of Oregon especially. Mr. Sheldon's excellent treatment of the subject called forth a spirited discussion of our local and national methods of dealing with the forestry problem.

GEORGE E. COGHILL,
Corresponding Secretary.

THE TORREY BOTANICAL CLUB.

THE meeting of May 31 was held at the American Museum of Natural History, President Rusby in the chair and eleven persons present.

The first paper on the scientific program was by Dr. C. Stuart Gager, and was entitled 'Preliminary Notes on the Effect of Radioactivity on Plants.' Plants grown in the presence of radium are subject to four different influences: (1) The α -rays, composed of a stream of material particles bearing a charge of positive electricity; (2) the β -rays,

made up of a stream of particles $1/2000$ the size of those of the α -rays and carrying a charge of negative electricity; (3) the γ -rays analogous to X-rays, but much more penetrating; (4) the emanation, which in a process of 'decay,' gives off α -rays as described, and eventually the β - and γ -rays mentioned above. The emanation behaves as a very heavy gas and may be condensed on a solid surface at a temperature of -150° C. The influence of radium upon plants, therefore, is of the nature of radiant energy.

The radium was employed in the form of the salt, radium bromide, of three strengths of activity, 1,500,000, 10,000 and 7,000 enclosed in sealed glass tubes, and also in the form of celluloid rods and cylinders covered with Lieber's radium coating of 10,000 and 25,000 activity. The glass shuts off practically all the α -rays, the β -rays penetrate through the glass more easily, while the γ -rays pass through glass very readily. By the use of the coated rods and tubes all three kinds of rays are available as well as the emanation.

The experiments indicate that the rays act as a stimulus, which varies in intensity with the strength and amount of radium used, the thickness of the seed-coats, distance of exposure and the intervention of moist soil between the radium and the plant. If the stimulus ranges between a minimum and an optimum germination and subsequent growth are accelerated. Within these limits the rate of alcoholic fermentation is at first increased, but continued exposure may result in overstimulation and consequent decrease in rate.

By over-stimulation germination and growth of seeds, gemmæ of Hepaticæ, and pollen grains are retarded and may be completely inhibited. Under the influence of the rays chloroplasts change their position in the cell, as under too intense illumination, and they are eventually destroyed, as is embryonic tissue in stems and roots.

Results similar in kind to the above are obtained by the use of radio-tellurium in a sealed glass tube. The influence here is confined chiefly to the α -rays. Experiments with

a rod coated with polonium, which gives off α -rays exclusively, have thus far given negative results.

Growth is retarded and may be inhibited by growing plants in an atmosphere containing the radium emanation, such as may be drawn from a cylinder lined with Lieber's coating.

Photographs of the experiments and specimens of the various radio-active preparations were exhibited.

The second paper, entitled 'Some Interesting Plants from Colombia,' was by Dr. H. H. Rusby.

In view of the lateness of the hour Dr. Rusby stated that he desired to reserve his paper as planned for some future meeting, when he could take the time to treat it more adequately, and for the present he would show some of the more interesting specimens and briefly comment on the same.

The collections were made by Herbert H. Smith, who spent four years collecting in the United States of Colombia near the town of Santa Marta, which is about fifty miles from the coast in the Sierra Nevada Mountains. Although this territory was collected over quite extensively by Karsten, whose collections are at St. Petersburg and consequently not readily accessible, and by Wm. Purdy, and various orchid collectors, Mr. Smith's efforts disclosed many novelties.

The total collection studied contained about 3,000 numbers, embracing between 2,300 and 2,400 species, of which number about fifteen per cent. are likely to prove new to science.

The specimens exhibited were most interesting, embracing arborescent Violaceæ, handsome twining Senecios, showy Vacciniaceæ, numerous anomalous Compositæ, and many other things undreamt of by collectors in temperate climes.

EDWARD W. BERRY,
Secretary.

DISCUSSION AND CORRESPONDENCE.

EXOGLOSSUM EAST OF THE DELAWARE BASIN.

TO THE EDITOR OF SCIENCE: In the issue of June 30, last, Mr. H. W. Fowler, of Philadelphia, writes on the occurrence of *Exoglossum*