

The Sand Flora of Eastern Iowa: B. SHIMEK.

The sandy areas in Muscatine and Louisa counties are chiefly discussed. The number of species peculiar to the sands of this region is small, the greater part of the flora being that of the prairies. Notes on seasonal succession on these areas are included.

The White Waterlily of Iowa: HENRY S. CONRAD.

The paper describes the variations of *Nymphaea odorata*, and gives in parallel columns the distinctions between this species and *Nymphaea tuberosa*. It questions the identification of all the waterlilies from the Great Lake region and the Central States, and asks for fuller study to determine the taxonomic value and the range of these forms.

A Section of Upper Sonoran Flora in Northern Oregon: MORTON E. PECK.

The paper gives first a brief account of the climatic conditions, topography, etc., in the neighborhood of Umatilla, Oregon. The several plant associations, with the areas they cover, are next described. The discussion closes with a complete annotated list of the species of seed plants known to inhabit the area under consideration.

JAMES H. LEES,
Secretary

DES MOINES, IA.

THE KENTUCKY ACADEMY OF SCIENCE

THE Kentucky Academy of Science held its third annual meeting at Lexington, in the lecture room of the physics department, University of Kentucky, May 6, 1916, President N. F. SMITH in the chair.

After a business session at which a number of new members were elected, and among other things a resolution was passed favoring the adoption of the bill now before Congress requiring the use of the Centigrade thermometer scale in government publications (H. R. 528), the following program was carried out:

President's Address—Problems and Progress of Twentieth-century Physics: N. F. SMITH.

Twentieth-century physics had its birth in the year 1895, when Roentgen discovered the new form of radiation known as X-rays. There followed rapidly after this a succession of important discoveries chiefly connected with radio-activity. From the many new facts discovered there has gradually developed the electronic theory of matter and electricity. It has been definitely es-

tablished that every electric charge is made up of an exact number of elementary electric charges or atoms of electricity. The magnitude of this elementary electric charge has been determined with great accuracy. From the value of this elementary charge other important physical constants can be accurately determined, among them the mass of an electron, and the masses of different atoms. It has been shown that every electric current is a convection current; the inertia of matter is probably entirely due to its electrical nature and is analogous to self-induction. It has been shown that X-rays are of the same character as light, but with a wave-length about one-ten-thousandth part as great. This has been established by the use of crystals as a diffraction grating. A reasonable theory of the structure of the atoms of the different elements has been established which is in close agreement with observed facts. The electromagnetic theory, as worked out by Maxwell, is incomplete and requires important modification to account for the facts of radiation. On the whole, remarkable progress has been made in the development of physical theory.

Astronomy Applied in Archeological and Historical Research: HENRY MEIER.

The author had collected a large number of events and circumstances mentioned in works on ancient history and given in ancient Greek or Roman classics, which events referred to a probable total eclipse of the sun or moon taking place about the time given and visible in the regions referred to. He then calculated the times of all possible eclipses for the time and place of each event and having thus established accurately the year, month and day of the event given by history he was enabled to determine with certainty other historic dates related to the event.

Likewise from the accurately measured orientations of certain ancient temples in Upper Egypt dedicated either to the sun or to a well-known star, he determined, based upon the facts that the obliquity of the sun's ecliptic is a variable quantity and that the declinations of fixed stars change from year to year, the probable time of construction of each temple, and thus he was able to fix chronologically the events related through inscriptions in each temple.

Some Historic Fish Remains: ARTHUR M. MILLER.

When the writer took charge of the department of geology, State College, in 1892, he found stored in the basement of the old Chemistry Building, some interesting fossil fish remains. He later found that

the labels pasted on them containing the initials "J. S. N." were placed there by J. S. Newberry and that these were the identical specimens described in Vol. 1, Paleontology of the Ohio Geological Survey, under the names *Orodus* and *Ctenacanthus* from the "Waverly Shale" exposed at Vanceburg, Ky. It was the finding in this deposit of the teeth of the fish which had been named *Orodus* in such close juxtaposition with the spines of the fish which had been named *Ctenacanthus*, that led Professor Newberry to conclude that these two structures belonged to one and the same species.

Reference was made to a previous account of these remains given by Professor Andrews in a volume of the Ohio Survey published in 1870 on work done in 1869, in which these specimens were credited to a Captain James Patterson, who found them in the Upper Black Shale (Sunbury Shale) at Vanceburg, Ky.—presumably in the course of quarrying the shale for oil distillation, an industry started in this country in the fifties or sixties of the last century, but speedily abandoned, when the discovery by Silliman, of Yale, led to the obtaining of paraffin more cheaply from petroleum.

Comment was made in this connection on how paleontology is indebted to commercial operations for some of its more interesting fossil remains.

A New Form of Frequency Meter: N. F. SMITH.

A rotating disc marked off in sectors alternately black and white is illuminated by an A. C. arc light. Since the light comes principally from the positive carbon, the illumination of the disc is intermittent. Therefore a stroboscopic effect is produced, and with proper speed of rotation the disc appears to stand still. From the rate of rotation of the disc, the frequency of the current is at once determined.

The Dr. Robert Peter Herbarium of the University of Kentucky: FRANK T. McFARLAND.

The paper shows the value of the Peter Herbarium as compared with the herbarium of the University of Kentucky.

In the University of Kentucky Herbarium are 4,106 specimens, of which 3,157 were collected by Dr. Robert Peter and Dr. Charles W. Short, of Lexington, from 1832 to about 1835. For the state, Dr. Peter has listed a total of 1,205 species, but only 470 mounted species are in the Herbarium. Only 592 species for the state are listed in the University of Kentucky Herbarium, with which the Peter Herbarium is consolidated, much fewer than the actual number in the state.

"Stem Rot" of Alfalfa and Clovers Caused by Sclerotinia Trifoliorum, Erik: ALFRED HOLLEY GILBERT.

The paper contains reference to previous observations, as reported in Kentucky Experiment Station Circ. No. 8, 1915; also a brief résumé of the history of the disease in Europe and America, and a report of a recent attack upon crimson clover in Kentucky.

Since the causal organism is a soil fungus and sclerotia may remain in the soil, retaining their vitality, possibly, for several years, a rotation of crops in which no one of the several legumes which serve as hosts for the fungus is grown for at least three years, is recommended as a control measure. The host plants so far as known are all the cultivated clovers and alfalfa. A common weed, *Abutilon*, was also observed to act as a host plant.

On the Distribution of Phosphorus in a Section of Bluegrass Soil: ALFRED M. PETER.

Analyses of soil samples from each 6 inches, from the surface to the rock, showed strikingly different percentages of phosphorus, ranging from 0.258 in the second to 6.692 in the twentieth 6 inches, with other maxima in the fifteenth and twenty-fifth 6 inches.

These differences are similar in degree to those existing between different layers of the phosphatic Lexington limestone, and are accounted for by supposing that the calcium carbonate of the limestone has been dissolved away, leaving most of the phosphate in layers of greater or less richness, according as the limestone layers were more or less phosphatic.

Precipitation of Cobalt and Nickel Salts in Gels:

C. A. NASH and JOHN ARDERY.

The following paper was read by title:

"Note on a Specimen of Radioactive Mineral," by J. W. Pryor.

At the afternoon session Dr. F. R. Moulton, of the University of Chicago, delivered an illustrated lecture on "Some Recent Discoveries in the Sideral Universe," in which the present methods of determining the distances and motions of the fixed stars were explained in a popular way.

The election of officers was as follows: Professor A. M. Miller, president; Dr. Garnett Ryland, vice-president; Professor P. P. Boyd, treasurer; Dr. A. M. Peter, secretary.

About forty members of the academy were in attendance and a large number of guests.

A. M. PETER,
Secretary