

for the chemical treatment of carbon will have special attention. The exhibition will be held in five halls situated on the exhibition grounds at Essen, which have been completely renovated for the purpose.

THE opening of the Museums of the Peaceful Arts in New York City took place on April 20, following a dinner meeting of the American members of the Newcomen Society. The Museums of the Peaceful Arts, of which Dr. F. C. Brown was recently appointed director, occupy temporary headquarters at the Scientific American Building, 24 West Fortieth Street, where a start has been made in organizing a great industrial technical museum for the city, made possible by a bequest from the late Henry R. Towne. The Newcomen Society is organized for the study of history and technology. Its headquarters are in London, but it has an active group in America. Charles Penrose, American member of the council, presided at the meeting which followed dinner at the Engineers' Club. This meeting was held simultaneously with a meeting in London, and a paper on Marc Sequin and the invention of the tubular boiler was read at both gatherings. Following the dinner the group adjourned to the museums, where they were greeted by Dr. George F. Kunz, president, and surveyed the exhibits so far collected, which include a portion of the lightning rod which Benjamin Franklin erected on St. Paul's Cathedral.

ACCORDING to *Nature* a Danish scientific expedition, under the leadership of Professor C. Olufsen, and supported by the Carlsberg fund, is now on its way to Senegal to explore the upper region of the valley of the River Niger, the Upper Volta, and the south part of the Sahara, especially Air (Asben or Agadiz). The expedition, the main purpose of which will be to collect objects of ethnological interest for the Danish Museums, is to return via Zinder and Kano, through Nigeria, to the Guinea Coast, and thence by sea to Dakar. Professor Olufsen will be accompanied by two Danish scientific workers, Oluf Hagerup (botanist) and Harry Madsen (zoologist).

## UNIVERSITY AND EDUCATIONAL NOTES

UNION COLLEGE, Schenectady, dedicated its new physics laboratory on April 30. The exercises were held in the building, which is nearing completion.

THE will of the late Dr. Walter B. James includes bequests of \$25,000 to Columbia University to the endowment fund of the College of Physicians and Surgeons; \$25,000 to the New York Academy of Medicine, and \$25,000 to the Trudeau Sanatorium, Saranac Lake.

It was announced, April 9, that Samuel Mather has subscribed \$1,000,000 toward the campaign to raise \$6,000,000 by the university hospitals of Cleveland for additions to the medical center. Thirteen years ago, Mr. Mather and his associates secured the land for the medical center, and his gifts to its institutions already total millions of dollars.

PROMOTIONS announced by Columbia University include the following from the grade of associate professor to full professor: Dr. Albert T. Poffenberger, psychology; Dr. Samuel R. Powers, natural sciences; Dr. William D. Reeve, mathematics; Dr. William E. Caldwell, clinical obstetrics and gynecology; Dr. William W. Herrick, clinical medicine, and James K. Finch, civil engineering.

DR. ROSS V. PATTERSON, dean of Jefferson Medical College, has been elected to a full professorship in medicine in the college. Other promotions include Dr. C. E. G. Shannon, to be professor of ophthalmology, and Dr. Fred J. Kalteyer, Dr. E. J. G. Beardsley, and Dr. Elmer H. Funk, professors of medicine.

DR. SIDNEY S. NEGUS, professor of organic chemistry at the University of Richmond, has been appointed to a similar position in the Medical College of Virginia, Richmond.

DR. J. R. HAAG, assistant professor of agricultural and biological chemistry at Pennsylvania State College, has been appointed to a position in the Oregon Experiment Station.

ASSISTANT PROFESSOR ETHEL M. TERRY-MCCOY has resigned from the staff of the department of chemistry at the University of Chicago.

DR. CECIL MCLAREN WEST has been appointed professor of anatomy in the University College of South Wales, in succession to Professor D. Hepburn, who retires from the beginning of October.

E. FOEX, director of the Central Station of Phytopathology, Paris, has been appointed professor of plant pathology at the National Horticultural School.

## DISCUSSION AND CORRESPONDENCE

### NaOH VERSUS Na<sub>2</sub>CO<sub>3</sub>

As a result of recent investigations upon alkali soils in the division of agricultural chemistry of the Arizona Agricultural Experiment Station, it has been shown that very few black alkali soils actually contain sodium carbonate, under field conditions. The alkalinity of such soils is due to the presence of sodium hydroxide, which in turn is derived from the hydrolysis of sodium zeolite.

The erroneous idea that many soils contain excessive amounts of sodium carbonate has arisen from

the fact that, in an analysis for water soluble salts, a high ratio of water to soil has been used. Under these conditions sodium zeolite will be hydrolyzed almost completely, and the alkalinity when calculated to the dry-soil basis may represent a relatively high percentage of sodium carbonate. The hydroxyl ions that are derived from the hydrolysis of sodium zeolite have heretofore been thought to be derived from the hydrolysis of sodium carbonate. When, in making an extract, the ratio of water to soil is gradually reduced, the percentage of hydroxyl ions is also reduced, until at a ratio that represents the optimum moisture content of the soil, few, if any, OH ions are found in the soil solution.

The titration curves for pH values of black alkali soils have been compared with curves made from solutions of known alkalis, and in this way the results of the soil investigation have been confirmed. This work, which has recently appeared as Technical Bulletin 13 of the Arizona Experiment Station, entitled "Sodium Hydroxide rather than Sodium Carbonate the Source of Alkalinity in Black Alkali Soils," by J. F. Breazeale and W. T. McGeorge, has an important bearing upon the reclamation of alkali lands by leaching, the application of gypsum and other correctives and to other practical soil problems.

P. S. BURGESS

UNIVERSITY OF ARIZONA

### RESPIRATION OF INSECTS

It has been known for a long time that insects breathe by means of openings called spiracles along both sides of the thorax and abdomen. These openings lead to tubes which branch and rebranch and thus spread to all parts of the body. The abdomen pulsates out and in during respiration.

In order to determine whether some of the spiracles were used for inhaling air and others for exhaling, the following experiments with large active grasshoppers were tried.

The first experiment consisted in placing the body of the grasshopper in a vertical position in a glass vessel. Water was then poured into the vessel until the abdomen was immersed in water and the head and thorax were out of water. The grasshopper was left in this position for twenty-four hours. At the end of that time it was taken out and appeared to be none the worse for its experience. During the course of the experiment I noticed that the abdomen continued to move in a normal manner and that air bubbles kept coming out of the abdomen.

The second experiment consisted in taking another grasshopper and reversing its position so that the head and thorax were under water and the abdomen only was out of water. The grasshopper was left in

this position for twenty-four hours and during this time air bubbles came out around the thorax and rose to the surface of the water. When the grasshopper was liberated it seemed quite normal.

In the third experiment a grasshopper was placed in a vertical position in water with only the head out of water to see if air entered the body by any openings around the head. Air bubbles left the body and in ten minutes the grasshopper was limp and apparently lifeless.

### CONCLUSIONS

These experiments would seem to prove that no special spiracles are used for inhaling and others used for exhaling, but rather that all are alike in this respect, as the abdomen expands air is taken in and as the body contracts the gases are exhaled.

The same thing is probably true of all insects.

D. A. MACKAY

OTTAWA COLLEGIATE INSTITUTE,  
OTTAWA, CANADA

### FOSSIL REMAINS IN THE LOESS OF EASTERN WASHINGTON

IN SCIENCE, page 477, November 12, 1926, announcement is made by O. W. Freeman of discovery of fossil bones of a mammoth (*Elephas primigenius*) in loessial deposits in the vicinity of Cheney, Washington.

This is of interest in connection with the study of the origin, distribution and age of the loessial soil-forming materials of eastern Washington, a subject which has been touched upon at intervals in the pages of this publication. It is particularly suggestive as indicating the age of accumulation of these great deposits from which the loessial soils of this region are derived, though widespread redistribution and modification of the soil materials have since taken and are still taking place.

The purpose of this comment is, however, to call attention to the fact that while reported fossils are rare, the writer, with Messrs. A. T. Strahorn and E. J. Carpenter, of the Bureau of Soils, found some large fossil bones embedded in loessial deposits exposed by a fresh highway cut in September, 1923. The remains were found about thirty miles north-east of Pasco on the Pasco-Kahlotus highway. They were partially removed during the following day under direction of Dr. Kirk Bryan, of the U. S. Geological Survey, and identified as a fossil elephant, and include thigh and pelvic bones, a number of ribs, vertebrae and the lower jaw. These fossil remains are now in the U. S. National Museum at Washington. The upper jaw and skull, however, which now appear essential to complete identification and restoration, were not recovered.