ments was adequate, although a forced draft could have been used if desired.

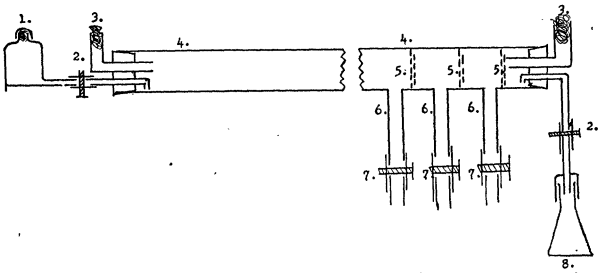

FIG. 2. Experiment II. Fermentation by brewer's yeast. Key: 1. Container for sterile substrate. 2. Screw clamps to regulate inflow and outflow in this case 50 ml per hour. 3. Aeration tubes cotton plugged. 4. Fermentation tube in this case 4 cm × 200 cm and containing 300 ml of substrate. 5. Wire screen baffles to help deposit of yeast cells in side arms. 6. Side arms for partially compacting and removing yeast cells. These side arms were 2 cm by 50 cm. 7. Screw clamps for use in removing semi compacted yeast mass. 8. Container for alcohol containing fluid.

These two experiments are presented with the idea that a useful method has been devised for the massive cultivation of micro-organisms without resort to very large containers with the attendant loss of time for discharge, cleaning and recharging. It is also believed that the technique could be applied to the cultivation of any micro-organism if the proper modifications in the basic apparatus were devised.

It is believed that the method would prevent a large loss of substrate by preventing the formation of mutants and by the possibility of stopping the reaction at any point if contamination should occur with only the loss of the preceding material.

WILLIAM A. MOOR
DEPARTMENT OF OPHTHALMOLOGY,
OSCAR JOHNSON INSTITUTE,
WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS

SOCIETIES AND MEETINGS

THE AMERICAN PHILOSOPHICAL SOCIETY

THE American Philosophical Society and the National Academy of Sciences held a joint meeting in Philadelphia on Friday and Saturday, November 16 and 17, 1945. The open sessions were devoted to a symposium on "Atomic Energy and its Implications." About four hundred members of the two societies and specially invited guests were present. Because of this large number and the fact that the meetings were open the sessions on Friday were held in the auditorium of the University Museum of the University of Pennsylvania, and on Saturday the open session was held in the Old Custom House, Chestnut Street below Fifth, now occupied by the Carl Schurz Foundation. At each of the open sessions there were approximately six hundred persons present.

The following papers were read at the morning and afternoon sessions on Friday:

Henry DeWolf Smyth, Princeton University, "The Scientific Background of the Atomic Bomb."

J. Robert Oppenheimer, California Institute of Technology, "Atomic Weapons."

Robert S. Stone, M.D., University of California, "The Health Protection Activities on the Plutonium Project."

Joseph H. Willits, The Rockefeller Foundation, "The Process of Social Adjustment to Atomic Energy."

Jacob Viner, University of Chicago, "Implications of Atomic Bomb for International Relations."

Irving Langmuir, General Electric Company, Schenectady, "World Control of Atomic Energy."

James T. Shotwell, Carnegie Endowment for International Peace, "The Control of Atomic Energy under the Charter."

Awards made by the National Academy of Sciences at the dinner on Friday evening at the Benjamin Franklin Hotel were announced in SCIENCE for November 30.

Preceding the Friday evening lecture by Arthur Holly Compton on "Atomic Energy as a Human Asset," which was given in the Auditorium of the Edison Building of the Philadelphia Electric Company, Dr. Conklin presented the Benjamin Franklin Medal of the American Philosophical Society on behalf of the society. After reviewing the history of this medal he turned to Dr. Compton and said "To you, Arthur Holly Compton, preeminent in science, distinguished successor of Franklin in exploring the fire from the sky in the form of cosmic rays, philosopher and statesman in education, ethics and international relations the American Philosophical Society awards this Benjamin Franklin Medal."

The following papers were read at the open session on Saturday:

Harold C. Urey, University of Chicago, "Methods and Objectives of Isotope Separation."

Enrico Fermi, University of Chicago, "The Development of the First Chain Reacting Pile."

Eugene P. Wigner, Princeton University, "Resonance Reactions."

John Wheeler, Princeton University, "Problems and Prospects in Elementary Particle Research."

All the papers read at this meeting will be published in No. 1 of Volume 90 of the Proceedings of the American Philosophical Society.

President Frank B. Jewett, of the National Academy of Sciences, telegraphed President Truman that the council of the academy at its meeting on November 15 in Philadelphia in connection with the joint meeting of the academy and the American Philosophical Society on "Atomic Energy and its Implications" expressed unanimous approval of the published text of the Declaration on Atomic Energy issued that day (November 15) jointly by President Truman and Prime Ministers Attlee of Great Britain and Mackenzie King of Canada.

The members of the American Philosophical Society in executive session on November 17, at the time of the joint meeting of the society and the National Academy of Sciences, adopted the following resolution to be presented to the President of the United States:

WHEREAS, the growth of knowledge is an important source of the nation's strength, and whereas, the greatest freedom for study and discussion is essential to the effective growth of knowledge and of the national welfare, it is *Resolved* that no legislation should interfere in any manner with basic scientific research and its publication in any field, and in particular with relation to atomic energy.

It was the general agreement of all those present at the meeting that it was one of the most important and successful meetings ever held by either society.

L. P. EISENHART

HALL OF THE AMERICAN PHILOSOPHICAL SOCIETY

DISCUSSION

THE SMALL MOUNDS OF THE GULF COASTAL PLAIN

IN various parts of the United States and in other parts of the world, areas of abundant small mounds have been frequently discovered and reported.[1,2,3] Of these, the mounds of the Gulf Coastal Plain are among the best known. During 1942 and 1943, the writer made almost daily airplane flights over various parts of the United States, but especially in the coastal areas of Texas and Louisiana, which afforded an opportunity to observe the excellently developed small mounds of the Gulf Coast. A further study was made on the ground where aerial observation showed these mounds to be well developed. Inasmuch as the writer has arrived at conclusions concerning their origin which differ from any theory that to his knowledge has been previously proposed, a discussion of these mounds is briefly presented here.

The mounds are present by the hundreds of thousands in a broad belt along that part of the Gulf Coastal Plain extending from near the Corpus Christi region of Texas eastward to the vicinity of Lafayette, Louisiana, where the mound-containing sediments are abruptly truncated by Mississippi alluvium. They are best developed and are nearly everywhere present in southeast Texas and southwest Louisiana on level or almost-level ground, where they form the so-called "pimple prairies." They are most commonly present and they are of most perfect form immediately to the landward of coastal lagoons, whereas inland the mounds are generally more scattered and less well-preserved. Mounds, of the type referred to here, are completely absent from the barrier beaches and related beach deposits and, also, are absent from the extensive area covered by wind-blown sand in the region between Corpus Christi and the Rio Grande River. In fact, the mounds are wholly confined to areas which appear to be brackish-swamp-deposited facies of the two extensive Quaternary formations, the Beaumont and the Lissie.

The mounds are symmetrical in form and rather uniform in size and shape. They are circular in ground plan and in vertical section they have the shape of a low flattened dome. Although they may vary in diameter from ten to one hundred feet, and in height from one to five feet, they average about thirty to fifty feet across and about two or three feet in height. Where the hillocks are well developed, they are scattered at intervals of about one hundred feet and occupy from ten to twenty-five per cent. of the land.

The mounds consist of dark gray loamy sand which at a depth ranging from two to four feet grades into a loamy clay similar to that of the inter-mound areas. No gravel is present either in the mounds or in the areas between them. No fossils or artifacts are found in these hillocks; however, inasmuch as layers of calcareous concretion are found in the subsoil, it is likely that fossils have been leached from the mounds. They are nearly always topped with a thick growth of tall dark-green weeds which makes them easy to see from the air. The mounds have no elongate axes and they do not have any other apparent orientation but rather are scattered at random. However, collectively, the mounds tend to be distributed in irregular belts parallel to the coast line. Commonly associated with the mounds are circular patches of sand which are commonly referred to locally as "sinks" or "slick spots." No vegetation grows upon these sandy

[1] A. C. Veatch, U. S. Geological Survey Prof. Paper 46, pp. 55–59, 1906.

[2] W. A. Dalquest and J. G. Scheffer, *Jour. Geol.*, 50: 1, 68–84, 1942.

[3] J. C. Branner, SCIENCE, n.s., 21, 514–516, 1905.