berg the study of the economic and social life of County Clare. Many aspects of Irish social life were examined, including the marketing system, land tenure, political institutions, the family, etc. At least two years of full-time work with an enlarged staff will be required before the necessary data are collected.

This year the archeological phase of the work was also successfully begun under the leadership of Dr. Hugh O'Neill Hencken, assistant curator of European archeology in the Peabody Museum of Harvard University, and Hallam L. Movius, Jr., of Harvard University. The excavations were conducted under the auspices of the National Museum of the Irish Free State, which will be the recipient of all archeological finds.

The first site investigated was a crannog or lake-dwelling of the tenth century A. D., at Ballinderry, near Moate, County Westmeath. Here the archeologists completed the most thorough investigation of such remains hitherto carried out in Ireland. The crannog was an immense wooden building erected on a platform of logs in the center of the lake and surrounded by a high palisade of stakes. Among the finds were truck loads of bones of wild and domesticated animals, remains of wooden tubs and barrels, iron knives, axes, bone combs and bronze pins. The most important discoveries were a bronze, heart-shaped oil lamp, ornamented in Keltic style, and a curiously carved Viking gaming-board. Both of these are unique.

Another successful excavation was carried out on the six hundred foot hill of Knockast, where a huge cairn, or stone grave, was explored. This yielded forty-three burials belonging to the Bronze Age, mostly cremations. A considerable assortment of implements was found. Many other sites must be explored in future seasons, since the archeology of Ireland is almost unknown.

The anthropometric or racial survey of the Free State will be under the direction of E. A. Hooton, professor of anthropology at Harvard University, who is also in general charge of the entire Irish project. The field work in physical anthropology will be deferred until the other aspects of the study are well under way.

THE NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING

THE Tenth National Exposition of Power and Mechanical Engineering is to be held at the Grand Central Palace, New York, from December 5 to 10, inclusive, and runs concurrently with the annual meetings of The American Society of Mechanical Engineers and The American Society of Refrigerating Engineers. It will be open daily from 12 noon until 10:30 P. M.

Features of the exposition include the products of three hundred manufacturers of power and mechanical equipment. Among the distinctly new things to be seen will be control devices of unique design, including a three-element water-level control; a new type of temperature control designed to eliminate hunting; a differential draft-control system; a device for controlling the fuel level in ball mills; and a new type of mechanical steam-flow meter. Many new designs of instruments will be seen, including high-pressure steam gages, fluid meters, condensation meters, recording thermometers and gages for distant pressure recording. Two distinctly new types of expansion joints will be shown for the first time. There will also be on view a superheater especially developed for return-tubular boilers.

The results of research will be reflected in many valves and fittings of alloy steels developed to meet the conditions imposed by the trend toward higher steam pressures and temperatures. Also the progress in welding within the last few years will be depicted by the display of welding fittings and fusion-welded boiler drums.

There will be an exhibit of chlorination methods which will give the visitor an opportunity to see by means of the microscope how the marine growths actually accumulate and how they can be effectively eliminated.

Two new types of oil burners will be exhibited, one of the wide-range mechanical-atomizing type and the other of the steam-atomizing type for burning refinery waste.

Among the many other new things may be mentioned a device for removing free air from condenser circulating water; a new type of vibration damper; and a hydraulic coupling for use between motors and fans. One manufacturer will show a thermodynamic motor deriving its power from the surrounding atmosphere.

The subject of atmospheric pollution will be treated from several angles, such as its economic aspect, methods of measurement, effect on the human system, research and progress in abatement. The New York City Department of Health, the Mellon Institute, the New York Meteorological Observatory of the U. S. Weather Bureau, Stevens Institute of Technology, the Pure Air Committee of the American Society of Mechanical Engineers and a number of smoke enforcement bodies are cooperating in this exhibit.

For Saturday morning there is being arranged a specially conducted inspection of the exposition by upperclassmen in several of the universities within convenient traveling distance. This tour will be preceded by addresses from prominent engineers from

the fields of mechanical engineering, refrigeration and heating and ventilation.

APPROPRIATIONS OF THE CARNEGIE CORPORATION

APPROPRIATIONS amounting to $5,256,000 to colleges, universities and other educational organizations were made by Carnegie Corporation during its fiscal year ending September 30, 1932, according to the report of President Frederick P. Keppel. These grants were for a wide variety of specific purposes within the fields of library service, adult education, the arts, scientific and educational research and publication.

Library activities received $873,000, one quarter of which was for purchase of books in twenty-one four year liberal arts colleges, scattered in fifteen states. Two colleges—Lafayette and Wesleyan—received $150,000 each for endowment of the college librarianship.

Three other institutions received endowment grants for various purposes: Stanford University, for the Food Research Institute, supported for a decade by the corporation and now turned over to the university, $750,000; Upper Canada College, $150,000, and Atlanta University, for endowment of a professorship in the school of business, $100,000.

The list of gifts devoted to scientific research includes subsidies for investigations of cosmic rays, both by Professor Millikan and by Professor Compton, on leukemia, solar radiation, cortin, vitamins, velocity of light, and in metallurgy; to educational research looking toward the improvement of instruction in colleges and universities, cooperation between secondary schools and colleges, appraisal of techniques of educational guidance, internal administration of colleges, effect on character of different types of education, economic factors in the practice of medicine, mental disorders, the psychology of later maturity, and the like. These account for $656,000.

Adult education, for which the largest grant was $150,000 to the American Association for Adult Education, received a total of $368,500. *The Journal of Adult Education,* now accepted as a standard publication, was aided by a subsidy of $15,000; the American Foundation for the Blind, for experiments in phonographic reproduction of books, $10,000; the University of Minnesota, for study of re-education of the unemployed, $25,000, and the Workers Education Bureau of America, for its program, $12,000.

In the list of institutions receiving aid for development of their fine arts programs are found: The University of Alberta, $30,000; Brown University, for a cooperative arts program with the community, $15,000. For its summer courses for arts teachers, the American Institute of Architects received $15,000; the Museum of the City of New York, $52,500; the New York Botanical Garden, $12,000; the American Federation of Arts, $30,000, and the College Art Association, for various activities, $55,000.

The corporation administers under its charter two funds: a major one, the income of which is to be spent in the United States; the other of $10,000,000, of which the income is applicable in the British Dominions and Colonies. From the latter fund, grants were made in South Africa, Australia, New Zealand, Canada and other places, for purposes similar to those prevailing under the larger funds.

FOREIGN GUESTS AT THE CENTURY OF PROGRESS MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THERE have been printed in SCIENCE (July 24 and August 21, 1931) articles by Colonel John S. Sewell, director of exhibits, describing the plans for the basic sciences at the Chicago Centennial Exposition and for invitations of foreign guests to attend the meeting of the American Association for the Advancement of Science and its affiliated societies to be held in June. The committee on foreign guests appointed at the Cleveland meeting of the association selected, with the cooperation of the sections of the association, the divisions of the National Research Council and the national scientific societies, a distinguished group of scientific men, representing the different sciences and the different nations to whom invitations were sent signed by Mr. Rufus Dawes, president of the exposition, and Professor John J. Abel, president of the association. A joint meeting of officers of the Century of Progress and the committee of the association was held in Chicago on November 12, and it was reported that acceptances had been received as follows:

MATHEMATICS

Leopold Fejér, Budapest
Tullio Levi-Civita, Rome

PHYSICS AND METEOROLOGY

J. Bjerknes, Bergen
Niels Bohr, Copenhagen
Enrico Fermi, Rome
A. Sommerfeld, Munich

CHEMISTRY

F. W. Aston, Cambridge
George Barger, Edinburgh
Robert Robinson, Oxford
P. Karrer, Zurich
T. Svedberg, Upsala
J. N. Brønsted, Copenhagen

GEOLOGY AND GEOGRAPHY

Albrecht Penck, Berlin
J. J. Sederholm, Helsingfors