spread horizon, indicating in this case also that the movement was from north to south. This culture is dated from 1000 to 500 B.C.

The discovery of these two early Ecuadorian cultures is significant because it provides definite evidence of the north-south direction of movement in this early prehistoric period. Prior to the work of Evans, Meggers, and Estrada, the origin of many traits in Peru could not be adequately explained, and the relationship between the early cultures with similar characteristics in Mexico and Peru could not be determined. The archeological investigations in Ecuador thus represent an important contribution to the solution of major problems in New World prehistory.

Baghdad Nuclear Center

King Faisal of Iraq recently opened the Baghdad Pact Nuclear Center at Shalichiyah, near Baghdad. The center includes a teaching laboratory for post-graduate courses of the same standard as the isotope school at Harwell, England, and has enough electronic and radiochemical equipment for the training of 20 students in peaceful uses of the atom. Britain furnished most of the necessary technical equipment, with Iraq supplying buildings. Instruction began this month.

Sir John Cockroft, Britain's atomic energy chief, has been elected chairman of the Baghdad Pact's scientific council. The first director of the center and four of the scientific staff are from Harwell.

MIT Earth Sciences Lab

Massachusetts Institute of Technology has set up a laboratory of earth sciences to study this planet's solid interior, the atmosphere, the oceans, and the land masses between. The laboratory will be operated jointly by the departments of meteorology, geology, and geophysics and is expected to become a research center for geologists, geochemists, geophysicists, meteorologists, and oceanographers.

Handbook of Mathematical Tables

The National Bureau of Standards has begun preparation of a *Handbook of Mathematical Tables*. In addition to the elementary functions, the *Handbook* will cover almost the entire field of transcendental functions. Expected to be ready before the end of 1958, it will appear as a volume of about 1000 pages—750 pages of tables, 50 pages of graphs, and 200 pages of text.

The project is supported by the National Science Foundation, and is being carried out by the bureau's computation laboratory and numerical analysis group. Correspondence regarding the *Handbook* should be addressed to Dr. M. Abramowitz, National Bureau of Standards, Washington 25, D.C.

Ford Aids Woodrow Wilson Fellowship Program

In an effort to combat the shortage of college teachers, the Ford Foundation has announced a $25-million appropriation for a large-scale extension and development of the National Woodrow Wilson Fellowship Program. This action will support a broad program to attract able college students into the academic profession and will provide graduate fellowships to potential college teachers at the rate of 1000 a year for the next 5 years.

Individual awards, which will be applied to tuition and living expenses for the first year of graduate study, are expected to average $2200 and will require approximately $11 million of the total appropriation. Another $10 million will go to universities for aid to graduate students beyond the first year. A nationwide recruiting program will absorb about $2.8 million, and administrative expenses over the 5-year period are expected to be $1 million.

Out of the total funds appropriated, $200,000 will be made available to the Association of American Universities and its affiliate, the Association of Graduate Schools, to provide for an immediate increase of 100 Wilson fellowships for the fall of 1957—a 50-percent rise over the 200 awarded this spring. The $200,000 will be paid to the University of Michigan as fiscal agent. The present national headquarters of the Woodrow Wilson organization is in Ann Arbor, Mich.

To conduct the expanded recruitment and fellowship program planned for the next 5 years, the organization is being reconstituted as a nonprofit corporation, the National Woodrow Wilson Fellowship Corporation. The independent governing board is to be made up of a combination of laymen and educators. Board members and executive officers will be announced later.

The recruitment program will be conducted largely through a corps of 100 or more faculty members, who will give approximately one-third of their time to stimulating faculty cooperation on approximately 1000 college campuses. Four or five full-time regional field directors will assist in developing and coordinating the program.

Nominations for Woodrow Wilson fellowships will be made by local faculty members, and selection will be made by regional committees and a national committee made up of active university and college faculty members. Fellowship recipients may, in general, attend the institutions of their choice and will be free to select their own fields of study. Awards formerly were made only in the humanities and social sciences. The new program includes the natural sciences and mathematics as well.

The $10 million allocated for assistance beyond the first year will be used for grants of $2000 each to the university at which each fellow enrolls. Three-fourths of this amount must be used for financial aid to graduate students, particularly in their final year. The aid provided by this stipend is at the discretion of the university, and it is not limited to Wilson fellows. The remaining one-fourth may be used by the university for additional fellowships or for strengthening its graduate program generally.

The Woodrow Wilson fellowships were initiated in 1945 by Princeton University. In 1952 a national organization was formed under the sponsorship of the Association of American Universities to conduct an expanded program. Prior to the Ford Foundation action, the Carnegie Corporation and the General Education Board of the Rockefeller Foundation supported it with grants of funds totaling $1,150,000.

Rand on Fallout

A detailed description of how radioactive products of nuclear explosions are borne aloft and fall to earth in the vicinity of the explosion and for several hundred miles downwind appears in a paper published by three scientists of the Rand Corporation of Santa Monica, Calif., in a recent issue of the *Journal of Meteorology,* official publication of the American Meteorological Society. The findings, recently declassified, were reported by William W. Kellogg, Stanley M. Greenfield, and R. Robert Rapp. Their paper, "Close-in fallout," is the result of research by Rand for the Atomic Energy Commission.

Rand has programmed the problem of computing the fallout from an atomic cloud for solution on a high-speed electronic digital computer (IBM-701). The computer is given the appropriate wind structure and atomic-cloud dimensions, and proceeds to calculate the location on the ground of 10,000 radioactive particles which are judged to be representative of the atomic debris. The machine takes approximately 1 hour to make this calculation.

In an effort to equip the civil defense planner with a ready means for estimating the probable distribution of fallout