

## SMITHSONIAN INSTITUTION

## ANNUAL REPORT FOR 1953-54

THE report of the Secretary of the Smithsonian Institution for the year ended June 30, 1954\*, refers to the completion of a new exhibition hall, opened to the public on April 14, 1954, as the first installation of the programme of modernization and reconditioning of exhibitions in the Institution which during the next nine years should transform entirely the outmoded, inadequate and sometimes uninteresting features of the Smithsonian exhibitions so that they can be seen in a modern suitable setting. This first hall displays the development of the archaeology of Central and South America before the coming of Columbus. Much progress was made during the year in developing detailed specifications for the new Museum of History and Technology, and further consideration has also been given to the buildings required for the National Zoological Park and the Natural History Building. The River Basin Programme was sharply curtailed, and the Secretary expresses anxiety lest, if funds are not made available next year, it will be forever too late to pursue the study of the early life of the original Americans, 80 per cent of whose important archaeological remains are in river basins.

For further details of these surveys, the Secretary refers to the report of the Bureau of American Ethnology; this latter report and those of the other nine bureaux administered by the Institution, of the library, of the executive committee of the Board of Regents, and that on publications are appended. During the year 632,243 specimens were added to the collections in the United States National Museum, visitors to which numbered 3,262,150, and in which on an average at least a hundred scientists not on the Smithsonian staff are daily at work. Field-work was conducted in Thailand, Venezuela, Panama, the Caroline Islands, Fiji, Mexico, and many parts of the United States. Dr. M. W. Stirling, director of the Bureau of American Ethnology, continued his studies of Panamanian archaeology, and Dr. H. B. Collins his Eskimo research and other arctic activities, including chairmanship of the committee supervising the preparation of the "Arctic Bibliography" for the Department of Defense. Studies of Olmec archaeological materials from southern Mexico were continued by Dr. P. Drucker, while field activities in the river basin surveys consisted chiefly of reconnaissance or surveys to locate sites that will be involved in construction work or eventually submerged by reservoirs. By June 30, 1954, archaeological surveys or excavations had been made since 1946 in 243 areas in 27 States and 4,345 archaeological sites recorded, of which 852 were recommended for excavation or further testing. Activities of the Missouri Basin project were greatly reduced for lack of funds, but six field parties operated in the Basin during the year. In Tennessee detailed surveys were made of the Cheatham Lock and Dam and Old Hickory Lock and Dam projects on the Cumberland River near Nashville.

The Astrophysical Observatory completed work on the ninth revised edition of the "Smithsonian Physical Tables" and on Vol. 7 of the "Annals of the Astrophysical Observatory". Solar-radiation studies were

\* Smithsonian Institution. Report of the Secretary and Financial Report of the Executive Committee of the Board of Regents for the Year ended June 30, 1954. (Smithsonian Publication 4182.) Pp. ix+175+4 plates. (Washington, D.C.: Government Printing Office, 1955.)

continued at Table Mountain, California, and Mount Montezuma, in Chile; and besides routine work, calibrations were made of a silver-disk pyroheliometer for the Meteorological Service of Canada, a modified Ångström pyroheliometer for the Meteorological Service of the Belgian Congo, and a normal-incidence Eppley pyroheliometer for the United States Weather Bureau. The Division of Radiation and Organisms has shown that the apical stem hook is an excellent and reproducible test object for measuring the effect of radiant energy and chemical factors in the photo-morphogenic response, and that triiodobenzoic acid, which opposes the effect of auxin in many other plant responses, produces an effect on the bean stem hook similar to that of the photo-reaction; studies have been completed of the effectiveness of various wave-lengths on the opening of the bean hook.

Progress was made in transport of the stored collections of the National Air Museum from Park Ridge, Illinois, to improved conditions at Suitland, Maryland, and three hundred and sixty specimens were added during the year. A special exhibit was arranged in December 1953 in connexion with the celebration of the fiftieth anniversary of powered flight, while the Museum's studies of the origin and history of the guided missile in the United States and of the pictorial history of the Wright brothers were materially advanced. Accessions to the National Zoological Park numbered 899 and visitors 3,616,220, but new buildings are urgently needed, as well as new paddocks. During the year twenty-two scientific workers went to the Canal Zone Biological Area for research, but the number of visitors decreased by a quarter.

The number of packages transmitted by the International Exchange Service decreased by 1,429 to 1,020,509; but 3,566 boxes, or 917 more than during 1952-53, were shipped to the foreign exchange bureaux, including sixty-two full sets and forty-three partial sets of United States government documents in exchange for official publications of foreign governments. Additions to the Library totalled 69,484 publications, and 515 new exchanges were arranged, while more than fifteen thousand reference questions were handled despite the fact that understaffing kept the bureau libraries closed except to staff and that overcrowding in the library of the National Collection of Fine Arts urgently needs to be relieved.

## VISCOSITY OF POLYMER SOLUTIONS

AS a continuation of two earlier seminars on polymer science (see *Nature*, 171, 65 (1953), and 172, 102 (1953)), four lectures on the viscosity of polymer solutions were given in the Chemistry Department of University College, London, on March 11. Short abstracts of the lectures were circulated in advance, and this facilitated the discussions which followed the lectures. Prof. P. J. Flory dealt with relationships between the volume taken up by a flexible chain-like polymer and the viscosity of solutions containing such species. In good solvents the polymer molecules expand, and in poorer ones they assume a more nearly statistically unperturbed configuration. Through the use of suitable viscosity measurements, it is possible to