

nearly a hundred, listing their geographical and specialized knowledge. From war agencies 460 requests for information have been received since the Pearl Harbour disaster, and the Institution is also serving as an important source of technical and geographical information. Together with the National Research Council, the American Council of Learned Societies, and the Social Science Research Council, the Institution has participated in the setting up of the Ethnogeographic Board to provide a central clearing house for information to army and navy intelligence and other war agencies in geography, languages and social sciences. An index of published photographs taken by scientific workers of the Institution in all parts of the world is being compiled.

The Institution has also undertaken the publication of a handbook of the Indians of South America, under the editorship of Dr. J. H. Seward, of the Bureau of American Ethnology, as well as of a list of the insects of South and Central America. Volume 6 of the *Annals of the Astrophysical Observatory*, covering its operations from 1920 to 1939, was published during the year and describes in detail the research on the variation of the sun's radiation. The Division of Radiation and Organisms, which was incorporated during the year as a branch of the Observatory, has continued its work on photosynthesis, plant growth and radiation, and the development of apparatus and methods. Experiments were continued on the factors that influence the changes in rates of respiration of plants, and work is in progress on the isolation and separation of two pigments that occur in dark-grown oat seedlings. The general appendix includes in the first place a statement "The 1914 Tests of the Langley 'Aerodrome'", by C. G. Abbot, which terminates the controversy between Dr. Orville Wright and the Institution. Among the original and unpublished papers in this appendix are those by J. A. Fleming on "The Sun and the Earth's Magnetic Field", E. P. Henderson and S. N. Perry on "Meteorites and their Metallic Constituents", and C. M. Packard on "Insect Enemies of our Cereal Crops".

Copper Conductors for Overhead Lines

In a paper read by Messrs. G. W. Preston and H. G. Taylor in London on April 12 before the Institution of Electrical Engineers, the creep of copper conductors and their initial non-elastic extension are considered in relation to their effect on sags and their compensation by an increase in erection tension as an alternative to pre-stressing. Information is given on the annealing characteristics of hard-drawn copper and copper-alloy conductors, with special reference to the effect of impurities in the metal, and maximum safe operating temperatures for such conductors are discussed, together with maximum permissible current loadings. Hollow copper conductors of various types for super-voltage lines are described, and the features of cadmium-copper conductors are dealt with in comparison with other types of high-tensile overhead conductor. Steel-reinforced copper conductors receive special attention, particularly in regard to the protection from corrosion of the steel wires, and results of a long-time investigation are given in full, with conclusions and recommendations. Copper-clad steel wires, their characteristics and use as reinforcement in copper conductors are discussed. Details are given of developments in the application of compressed

sleeve joints to copper and copper-alloy conductors, and suitable joints for cadmium-copper and steel-cored copper conductors are described and test results given.

New Products from Cellulose

ACCORDING to an annotation in the January issue of the *Anglo-Swedish Review*, the Swedish Cellulose Co. recently put on the market a wood-pulp product named 'Cellufix'; its manufacture requires the use of alkali, chlorine and alcohol, all of which are produced in Sweden. It is viscous, soluble in water at any temperature and so highly concentrated that a 3 per cent solution will yield a consistency equal to butter. It is odourless and tasteless, and its present main use is as wall-paper paste, as putty and for part of white-wash. 'Cellufix' is also used in textile mills as size and for other purposes. A specially purified quality of 'Cellufix' called 'Cellugel' is used in the food and chemical industries to give bulk to certain products and is also used as a substitute for glycerine.

Planetaria of the World

MR. ROY K. MARSHALL continues his articles on this subject in the December and January issues of *Sky and Telescope* (see NATURE, 153, 191; Feb. 12, 1944) with a very full description of the Fels Planetarium at the Franklin Institute, Philadelphia. He includes a few photographs of other planetaria also. The technical details of the instrument will prove interesting to many readers. The most complicated feature of the planetarium is the mechanism which reproduces the motions of the sun, moon and planets, and it is remarkable that comparatively few visitors make any inquiries about this. Five projectors are in the sun cage, and two of these are for a glow of light or aureole around the sun's image, simulating the strong scattering of light seen in the neighbourhood of the sun. One is for the zodiacal light, and a pair for the glow of the gegenschein. The precession of the equinoxes is reproduced in the planetarium by rotating the dumbbell portion of the instrument about an axis, and in 75 seconds it is possible to pass through the whole cycle of nearly 26,000 years. On certain occasions demonstrations of a highly dramatic nature have been presented—including a trip to the moon during which very realistic reproductions of lunar craters are produced. In the words of Dr. Philip Fox, describing the first Adler Planetarium, it is "not a trivial plaything, a mimic aping firmament, but the heavens portrayed in great dignity and splendour, dynamic, inspiring, in a way that dispels the mystery but retains the majesty".

Rainfall in the Nile Basin

A SYNOPSIS of rainfall statistics for the Nile Basin up to 1937 forms a valuable volume ("The Nile Basin", 6. By H. E. Hurst and R. P. Black. Physical Dept. Paper No. 43. Ministry of Public Works, Egypt. Cairo, 1943. 10s.). It includes figures from the Sudan, Uganda, Kenya, Tanganyika and the Belgian Congo. There are also figures, though admittedly incomplete, from Abyssinia. The stations are grouped by countries, and within each group are arranged by latitude from north to south. Statistics just outside the limits of the Nile basin are included. As a rule, stations with less than five years records are omitted. Figures from about four hundred stations make it possible to give a large-scale map of the total annual rainfall