

for the assay of vaccines to be used for human inoculations. The rabbit scarification method has considerable advantages: the results have been sufficiently correlated with those of human vaccination. It is economical in that two test vaccines can be directly

compared with a control on three animals, and a minimum amount of training of personnel is required. By the use of the modifications suggested, test results can be determined and expressed in relative terms by simple mathematical means.

## THE ROCKEFELLER FOUNDATION

THE annual report of the Rockefeller Foundation for 1960\* includes, besides the President's review, the more general aspects of which have been discussed in the November 18 issue of *Nature* (192, 587; 1961), reports on the major features of the Foundation's support during the year for work in the medical and natural sciences, the humanities, the social sciences and the agricultural sciences. In agriculture, the Foundation's operating programme is devoted primarily on research to overcome or minimize the hazards to the production of food crops and livestock, and to train competent local scientists to direct their countries' agricultural research services. Of some 2.8 million dollars in aid of research and teaching, 405,350 dollars were for agricultural and veterinary science at eight different institutions in Africa, 300,000 dollars to the Ministry of Agriculture, Peru, and the Agrarian University for co-operative crop improvement programmes. The substantial assistance given to the Mexican, Colombian, Chilean and Indian Agricultural Programmes and the results of these programmes are outlined in the President's review and, besides, in the Inter-American Maize Improvement Project a very successful pattern of co-operation has been established among the six Central American republics which in seven years has greatly increased maize production in these countries and built up a corps of well-trained specialists in maize production. This project is now being organized into regional units beginning with a Central American programme and an Andean zone programme. Among other grants in this field may be mentioned those to the Boyce Thompson Institute for Plant Research for the study of obligate parasitism, to four Polish Institutions for the purchase abroad of equipment for research and teaching in the plant and animal sciences, and to the Kansas State University of Agriculture and Applied Science for research in the biological and physiological changes in wheat during storage.

In the medical and natural sciences, the President reviews more particularly the Foundation's support for virology, to which nearly 1.5 million dollars were devoted in 1960, and especially to the work on arthropod-borne (arbor) viruses, where it now appears that the HeLa cell line, originally isolated from a human carcinoma, can be used for the propagation and study of all the 'arbor' viruses so far tested when cultivated under special conditions. It has already proved extremely useful in studying the chemical and physical properties of Semliki Forest virus, a prototype group A agent. Besides the central laboratories in New York, where the programme is co-ordinated, field stations are maintained in North and South America and in India, and surveys of arbor virus diseases have been made in Mozambique, in Bechuanaland and Angola as well as parts of South Africa. The programme is basically a fact-finding undertaking to

determine the incidence, epidemiology and importance of the various 'arbor' viruses, which are largely regional. Continuity of land surfaces may lead to a wide distribution of agents, as illustrated recently by the dramatic appearance in India of African horse-sickness, the causative virus being transmitted by a species of very small biting midges of the *Culicoides* species.

Among other grants for the medical and natural sciences, in which field more than 4 million dollars were for professional education, are those to the National University of Mexico for its research on the chemistry of natural products; to the University of Valle, Colombia, for research in experimental medicine; to the University of Melbourne for research in experimental physiology; to Kyoto University for behaviour studies in two species of monkeys; to the Population Council, New York, for its co-operative programme on population problems; to Oberlin College, Ohio, for a new natural science building; to the University College of Rhodesia and Nyasaland for research on sleeping sickness and bilharziasis by the Department of Zoology; to University College, London, for research in human genetics; to Harvard University, to establish a Centre for the Study of Nutritional Disease; for research in enzyme chemistry at the Karolinska Institute, Stockholm, and the University of Amsterdam; for studies of cellular metabolism at the University of Oxford; for biochemical research at the University of Rome; and for research in biophysics at King's College, London, and at the Indian Cancer Research Centre, Bombay.

In the social sciences, grants totalling 1.3 million dollars to assist the quest for rapid political and economic development included a grant to enable the International Bank for Reconstruction and Development to furnish basic working libraries on economic development to ministries of finance or economic affairs, development corporations, or central banks in emergent nations. Other grants in this field went to the Centre for International Studies, Mexico City, to the Institute of Public Administration, University of the Philippines, and to Hitotsubashi University, Tokyo, for a study of economic growth in Japan. The 875,000 dollars in support of the social sciences and basic disciplines included grants to the National Bureau of Economic Research, New York, for research on international trade; to the University of Michigan for a study of voting behaviour; and to Harvard University towards the costs of a conference on input-output techniques. The 478,000 dollars in support of studies of the fundamental problems of contemporary society included grants to the Centre for Studies and Research in International Law and International Relations at the Hague Academy of International Law; to the Free University of Brussels for the study of the national economic problems of the West; to the American Council of Learned Societies for a current digest of the Soviet Press and to Harvard University and the Massachusetts Institute of Technology for an arms control seminar.

\* The Rockefeller Foundation Annual Report, 1960. (Rockefeller Foundation, 111 West 50th Street, New York, 1961.)