tainly it is not clear whether this is something that is controllable or even susceptible to study or whether, once a significant innovation is made, others inevitably follow in an essentially uncontrollable fashion. In large measure, any attempt to control the pace of introduction of a technology involves ethical considerations, and these become of primary importance when the technology is medical. With the Manyfarms project we have not really had to face up to this formidable question. For many delays, of a type to be expected in any field program, resulted in a situation in which we could not have simultaneously introduced the many individual elements of a total program even if we had wanted to do so. Consequently, we have tended to introduce one thing at a time. Moreover, in making our choices we derived considerable freedom from the fact that the governmental and tribal programs are both expanding at such a rate that by the time our long-term studies are completed, any appropriate services from our program can be maintained.

In most development programs in health, however, this question of pace looms importantly, especially in the case of programs devoted to the control of a single disease, such as tuberculosis. Unless we can acquire wisdom in this matter, the possibility of actually doing harm through technologic development programs in health is very real. At the present time, however, we cannot pretend that we have found a way to investigate this question of "rate of introduction" in the Manyfarms studies and can only state that we are devoting considerable attention to attempts to find such a way. In the meantime, in our thinking we try to be guided by the thought expressed several years ago by the distinguished former United States diplomat George Kennan (*6*): "Wherever the authority of the past is too suddenly and too drastically undermined—wherever the past ceases to be the great and reliable reference book of human problems—wherever, above all, the experience of the father becomes irrelevant to the trials and searchings of the son—there the foundations of man's inner health and stability begin to crumble. Insecurity and panic begin to take over, conduct becomes erratic and aggressive. These, unfortunately, are the marks of an era of rapid technological or social change. A great portion of our globe is today thus affected. And if the price of adjustment to rapid population growth is to cut man's ties to the past and to catapult him violently across centuries of adjustment into some new and unfamiliar technological stratosphere, then I am not sure that the achievement is worth the price."

References and Notes

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Science in the News

Scientific Activity in Africa Growing; U.S. Education Aid Rising Slowly

The political and economic changes that are taking place in many African countries as they struggle for independence seem to be stimulating rather than retarding scientific activity.

Munitalp Meteorological Institute

A recent event that augurs well for African science is the announcement that an Institute of Tropical Meteorology is to be established in Kenya with funds provided by the Munitalp Foundation. This news was reported on 1 December by Lord Twining, chairman of the board of the foundation, when he welcomed scientists from 26 countries to the opening of a 17-day symposium on tropical meteorology that took place in Nairobi, capital of Kenya. Kenya is a British colony and protectorate that is seeking independence. The symposium was sponsored by Munitalp and the World Meteorological Organization.

The Munitalp Foundation will contribute £40,000 for capital expenditure on buildings and equipment and £12,000 a year for 10 years to meet operating costs. The institute will probably be located in Maguga, on the outskirts of Nairobi.

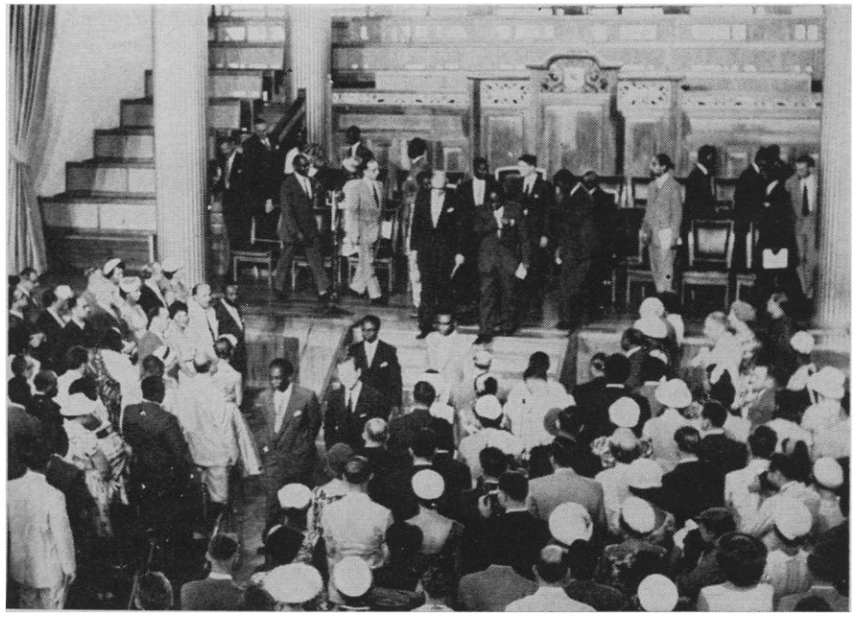
Munitalp ("platinum" spelled backwards), which has now transferred its headquarters to Africa, was incorporated in 1949 in the state of Connecticut. The foundation has long supported basic meteorological research in the United States—research such as the cloud physics investigations of Vincent Schaefer.

In his December announcement, Lord Twining explained that agreement had been reached with the East African High Commission for the new institute to be associated with the East African Meteorological Department and with the East African Agricultural and Forestry Research Organization in Maguga. He emphasized that while the institute would work in close cooperation with these two bodies, it would retain its independence and would be free to carry out work for the benefit of all countries in tropical Africa.

Lord Twining invited the countries and organizations participating in the Nairobi symposium to cooperate with the new organization, pointing out that although the institute will initiate and conduct particular investigations, among its most important functions will be the collection and collation of data and the dissemination of knowledge.

United States Delegate Comments

V. D. Rockney of the U.S. Weather Bureau in Washington, who attended



Prime Minister Nkrumah and Prince Philip, Duke of Edinburgh (center), leave a hall in Accra after inauguration of the Ghana Academy of Science and Learning.

the Nairobi symposium, strongly recommends that the United States detail one or two "really top" meteorologists to work at the new institute. He points out that if a number of countries lend experienced investigators, the institute will quickly be provided with a superior research corps that can make a real contribution to the progress of African science. He stressed the supranational character of the project, pointing out that the organization hopes to attract research workers and students and to secure contracts from many countries in Africa.

Rockney also mentioned that he was impressed by the extent of African participation in the Nairobi symposium. Some 17 states and territories were represented. Each delegation was composed of the chiefs of the state meteorological services, and in most cases at least one of these was a native African. In addition, Rockney made special reference to an unusually effective banquet address of thanks that was delivered on behalf of all the visitors by I. O. Emore of the Meteorological Service of Nigeria.

Ghana Academy Established

Another development that demonstrates a rising interest in science in Africa is the recent establishment of the Ghana Academy of Science and Learning. On 27 November Prince Philip, Duke of Edinburgh, visited Accra to officially open the new academy, which was organized at the initiative of Prime Minister Kwame Nkrumah. Ghana is a newly independent member of the British Commonwealth and will change its form of government from a monarchy to a republic on 1 July.

The objectives of the academy are to promote study and dissemination of knowledge in all fields of science and learning, to establish and maintain standards of endeavor in these fields in Ghana, and to recognize outstanding contributions to the advancement of science and learning in Ghana. The new organization has 20 members. The Duke of Edinburgh has agreed to serve as president for the first 2 years; Prime Minister Nkrumah is chairman.

First Federal Congress Scheduled

Still another evidence of increased scientific activity in Africa is the organization of the First Federal Science Congress, a meeting of international scope that is to be held at the University College of Rhodesia and Nyasaland, Salisbury, Southern Rhodesia, 17–21 May. Salisbury is the capital of the Federation of Rhodesia and Nyasaland, which consists of Northern Rhodesia and Nyasaland, protectorates, and Southern Rhodesia, a self-governing colony. This is the first congress of its kind to be held within the boundaries of the federation; it is being supported by the scientific societies and associations in the federation, as well as by the larger industrial and mining organizations.

The theme of the congress is "Science in Central Africa." There will be three sections, one in the physical sciences, including geology, meteorology, and engineering; one in the biological sciences, including medicine and agriculture; and one in the social sciences, including pre-history and archeology.

More detailed information may be obtained from the secretary general of the congress, Dr. D. F. Mettrick, University College of Rhodesia and Nyasaland, Private Bag 167H, Salisbury, Southern Rhodesia.

United States Aid Increasing

The United States is just beginning to make substantial contributions to the training of African scientists. A Weather Bureau spokesman says that of the 182 people who have come to this country during the last 10 years to be trained in meteorology under government auspices, only seven were from Africa, although meteorology, because of its bearing on agriculture, is one of Africa's most important sciences. He indicated that this proportion was probably typical for other fields of science.

Figures released by the Institute of International Education on public and private United States support of foreign scholars show that although the number of visiting African faculty members in all fields rose between 1957 and 1959, the rise was only from 24 to 42. The majority of these faculty members were scientists, as indicated by the following breakdowns (the first figure is for 1957, the second for 1959): agriculture—0, 2; business administration—2, 3; education—1, 2; engineering—1, 7; humanities—5, 6; medicine—4, 6; natural and physical sciences—4, 11; social sciences—7, 5.

African students in this country in 1957 totaled 1424; 170 of these were in the medical sciences, 213 in the physical and natural sciences, and 48 in sociology, psychology, and social work. In 1959 the over-all figure rose to 1735; there were 165 in the medical sciences, 252 in the physical and natural sciences, and 65 in sociology, psychology, and social work.

Although they show some increases, the numbers are small, especially when the figures are compared, for example, with those for the Near and Middle

East, a somewhat similar area. In 1957 there were 65 faculty members from the Near and Middle East in this country and 5243 students; the 1959 totals are 132 faculty members and 6619 students.

House Committee to Provide Forum for Scientists

A group of scientists has been invited to use a congressional committee as a forum in which they can present their ideas. Chairman Overton Brooks (D-La.) of the House Committee on Science and Astronautics reports that 12 scientists and engineers have agreed to serve on a science advisory panel to aid the committee in its work. The members of the panel will meet with the committee once or twice a year.

The Science and Astronautics Committee, which is entering its second year of operation, is the first committee in Congress to be devoted to science in general. In announcing the new advisory group, Brooks said:

"It is unfortunately true that too many times scientists with important ideas that would help advance the interests of the United States and mankind in general have been unable to find anyone to listen to them. Theirs have been, on too many occasions, voices in the wilderness.

"Now, through this panel, we shall make available to them a public forum in which they can be heard. If their proposals have merit, and I am confident they will, the Committee will give them the utmost consideration and, if necessary, enact such legislation as is required to carry them out."

Panel Members Named

The members of the advisory panel, the fields in which they specialize, and their affiliations are as follows: Edward J. Baldes, biophysics, senior consultant, Mayo Clinic; Clifford C. Furnas, chemical engineering, chancellor of the University of Buffalo; Martin Goland, applied mechanics, Southwest Research Institute, San Antonio, Tex.; W. Albert Noyes, Jr., general chemistry, University of Rochester; Clarence P. Oliver, genetics and zoology, University of Texas; Sverre Petterssen, meteorology, University of Chicago; Roger Revelle, geophysics and oceanography, director, Scripps Institution of Oceanography, University of California, La Jolla; Richard L. Russell, geology, Louisiana State University; H. Guyford Stever, aeronautical engineering, Massachusetts Institute of Technology; James A. Van Allen, nuclear physics and cosmic rays, State University of Iowa; Fred L. Whipple, astronomy, director, Astrophysical Observatory, Smithsonian Institution, Cambridge, Mass.; and Maurice J. Zucrow, jet propulsion, Purdue University.

Canada's Oceanographic Research To Be under New Committee

The Canadian Government has set up a committee to coordinate and direct its work in oceanography and to represent the government internationally in the field of oceanographic research. In a move to insure that Canadian research in oceanography is carried out on an integrated basis and, at the same time, to maintain the necessary international liaison with other countries doing similar research, the Canadian Government has reorganized its Joint Committee on Oceanography and renamed it the Canadian Committee on Oceanography.

Federal agencies interested in oceanography are the Royal Canadian Navy, the Fisheries Research Board, the Department of Mines and Technical Surveys, the Defence Research Board, the National Research Council, and the Meteorological Branch and the Marine Services of the Department of Transport. The new committee will comprise representatives from these agencies as well as from universities interested in this field of work. W. E. van Steenburgh, director general of scientific services of the Department of Mines and Technical Surveys, has been selected chairman of the new committee, and H. B. Hachey of the Fisheries Research Board has been named secretary.

Growing awareness throughout the world of the vital current importance of oceanographic research has focused attention on the necessity for such research in countries like Canada, which possess long coast lines and extensive continental shelves. More recently, Canada's need for a national committee empowered to represent the government on international committees has been evident. In particular, the new committee will represent Canada at the Special Conference on Oceanographic Research (SCOR) of the International Council of Scientific Unions and on the NATO Scientific Committee on Oceanographic Research.

The reorganization of the Canadian Committee on Oceanography, by providing better coordination of federal activities in this field with the work of the universities, will give added impetus to Canada's program in oceanography. A major feature of this program is the establishment on the east coast, under the Department of Mines and Technical Surveys, of a $3-million oceanographic institute, to be known as the Bedford Institute of Oceanography. The new institute, which will have facilities for study in any phase of the science, is being built in Bedford Basin near Halifax. Construction will take 5 years. When the institute is in operation it will have a staff of some 300 oceanographers, hydrographers, submarine geologists, geophysicists, and other scientific personnel, plus supporting staff, and an operating fleet of ten oceanographic and hydrographic vessels.

William M. Cameron, leading Canadian authority on oceanography and director of plans of the Defence Research Board, will direct the expanding oceanographic research program of the Department of Mines and Technical Surveys. He will have charge of the over-all development of the new Bedford Institute.

The Fisheries Research Board and the Department of Mines and Technical Surveys will completely coordinate their oceanographic activities on the east coast; the physical oceanographers of the Fisheries Research Board will be housed in the institute, while the board's biological research activities will continue to be located at St. Andrews, New Brunswick.

A multi-million-dollar shipbuilding program will provide the fleet of vessels. The first of these, the $7-million *C.G.S. Hudson*, is expected to be commissioned in 1961.

On the west coast, Canadian oceanographic investigations are carried out by the Pacific Oceanographic Group of the Fisheries Research Board; this group will maintain close liaison with the committee.

In the Arctic, Canada has already initiated a broad program of research along the hundreds of miles of continental shelf that comprise the rim of the Arctic Basin. One phase of the study deals with the oceanography of