

Weather Bureau: Partnership of Science and Government Nearly a Century Old; New Chief Due

An old-timer in the nursery of science-government relations, though something of a dwarf in a land of giants, is the U.S. Weather Bureau, which has been channeling whatever knowledge science has been able to muster about the weather to specialized clients, as well as to the general public, since 1870. President Kennedy's appointment last week of Robert M. White, a meteorologist who is currently president of a private research center specializing in environmental sciences in Hartford, Conn., as the Weather Bureau's new chief, comes at a time of considerable expansion of the bureau's activities, and of rising activity in meteorology generally, stimulated in part by the government's role in developing meteorological satellites. White was chosen from a list of qualified persons drawn up for the President by the National Academy of Sciences to replace Francis W. Reichelderfer, who is retiring after heading the Weather Bureau for a quarter of a century. If there are no unexpected hitches in the Senate confirmation hearings, White will take over the 5000-man bureau early in October.

Beginning, like many of the government's early scientific functions, in the War Department's Signal Corps, with an emphasis on service to navigators, the Weather Bureau was transferred to the Department of Agriculture in 1891, where it busied itself with reporting rainfall and temperatures to cotton growers, displaying warnings of storms and frosts, and otherwise supporting the country's growing commercial and agricultural enterprises. With the coming of aviation, the bureau assumed responsibilities for supplying meteorological data to pilots as well, and it became part of the Commerce Department, to which control of civil aviation was initially allotted, in 1940. The bureau is still part of Commerce, though the department relinquished its jurisdiction over civilian airspace to a joint civil-military regulating body, the Federal Aviation Agency, in 1958.

Basically, the job of the bureau is to dog the trail of technology and adjust its services to the new public needs that technological change constantly produces. The bureau now does technical work for the U.S. Public Health Service in predicting patterns of air pollution

and radioactive fallout, for example, and it has adapted to the jet age by providing forecasts for the higher altitudes at which jets travel. The increasing relevance of global weather conditions to American aviation, as well as the lively interest of the World Meteorological Organization in international cooperation, have given the Weather Bureau's activities an increasingly cosmopolitan flavor. A recent agreement for the continuous transmission of weather data on a special wire between Washington and Moscow, though details remain to be worked out, is indicative of some of the bureau's current interests, and there has been cooperation with Latin American countries, especially in hurricane forecasting, for a number of years. But the bureau straddles several technological eras, and is still responsible for providing whatever aid it can to those people for whom the old perils of forest fires, storms, droughts, and cold waves remain of greater concern than today's temperature in London.

Within the Commerce Department, the Weather Bureau coexists with about ten other agencies with scientific responsibilities, among which the most important are probably the Patent Office, the Census Bureau, the Coast and Geodetic Survey, and the National Bureau of Standards. Until recently, the climate and organization for science at the Commerce Department were not the most hospitable in government, and the smaller agencies had a difficult time making themselves heard, but with the designation of a new post, the Assistant Secretary of Commerce for Science and Technology, and the appointment, in May 1962, of J. Herbert Hollomon to fill it, the bureau, at least, has had effective support and has been better able to hold its own in competition with some of the more aggressive agencies.

Thanks, in part, to Hollomon's support, the Weather Bureau funds NASA's research and development work on weather satellites, and is essentially the controlling agency in the system of weather satellites that is greatly improving both knowledge of weather patterns and the speed at which such knowledge can be transmitted. Hollomon's usefulness to the bureau, and to its new chief, will doubtless be enhanced by his own recent appointment as chairman of the Administration's interagency committee on atmospheric sciences, a post formerly held by the retired director of the National Science Foundation, Alan T. Waterman.

The growth of the Weather Bureau, as well as the expansion of its scientific domain, is easily measured by its budget which has grown from \$27 million in 1954 to \$110 million requested for 1964, with an even higher point, \$116 million, registered in 1963. Most of the increase comes from the satellite program, which made its first appearance in the budget in 1961, but the bureau's basic research and development expenditures (principally devoted to intramural activities, though some fellowships are offered for outside work) have also risen rapidly. The cutback in the current budget does not indicate a slacking off of the satellite program but the increasing (and unexpected) longevity of the Tiros satellites already launched, from an estimated 3 months to about 6 months. Since shooting a weather satellite up costs about \$11 million, their longer lives have meant a considerable saving; another economy, albeit a less desirable one, has been the delay in readying the second-generation weather satellite, the Nimbus, for launching. The first launching is now scheduled for next winter; seven Tiros satellites have been launched, the latest one on 14 July 1963.

The Weather Bureau has been quick to insist on its prerogatives in meteorological satellites, as in most fields that immediately affect the quality of service it offers. But there is some feeling among meteorologists that the bureau has not been equally zealous in pursuing research leads that might ultimately offer greater promise than even the most revolutionary advance limited simply to means of weather forecasting. The criticism is probably a fair reflection of the bureau's basic responsibilities, which turn more on providing the best services current knowledge can offer than on advancing meteorological knowledge per se. But toward at least one field of increasing interest to meteorologists—weather modification and control—the Weather Bureau has maintained a consistently negative attitude ever since 1946, when one of its chief scientists disputed the results of some of the earliest work in the field. Partly as a result of the bureau's lack of interest, the responsibility for directing civilian research in weather modification has fallen, by congressional directive, largely on the National Science Foundation, which has been spending over \$1 million annually in the field since 1957. The difference in the

two agencies' enthusiasm for the subject is well illustrated by their most recent pronouncements. The Weather Bureau's retiring director, Francis Reichelderfer, in replying to a question from a congressman during appropriations hearings last winter, on whether there had been any progress in weather modification, replied, "In a practical sense, the advancement has been very little so far," and he got off the subject as quickly as he could. By contrast, the opening line of NSF's annual report to the President on weather modification, issued 2 weeks ago, bristles with hope: "During recent years the horizons of weather modification have expanded dramatically." But if the gulf between the agencies is great, and if the Weather Bureau has been inclined to take a rather patronizing view of the age-old request that it should please change the weather instead of just predicting it, there are hints from knowledgeable outsiders that under its new director this attitude may change, and there is the glimmer of a possibility that someday the weather may be changeable as well.—ELINOR LANGER

Announcements

A 400-mile section of southeastern Turkey is the center of an **international expedition** to trace man's transition from a hunting to an agricultural stage. The project is scheduled to begin 10 September and will last a year, in the headwater region of the Tigris and Euphrates rivers. It will be directed by Halet Çambel of the University of Istanbul and Robert J. Braidwood, professor of anthropology at the University of Chicago. An international staff of 25 scientists and scholars will participate. The expedition is sponsored by the University of Istanbul and the Oriental Institute of the University of Chicago.

An interdisciplinary advanced study of the **communist system of government** has been established at Stanford University under a 5-year Ford Foundation grant. The research-oriented program will emphasize the community characteristics of the communist system, with comparative studies of individual member communities within the system. (J. F. Triska, Stanford Studies of the Communist System, Stanford University, Stanford, Calif.)

The University of Pittsburgh and Carnegie Institute of Technology plan to begin a cooperative graduate program in **earth sciences** in September. The institutions will work together in administering the program, determining new projects and policies, and choosing new staff members; fellowships received by students may be used at either institution, and credits earned will be accepted at either school.

The Ford Foundation has awarded a series of grants for training, research, and experimental programs on **population problems** in the U.S. and foreign nations. The largest appropriation, \$5 million, has been designated for a family-planning and health program in India, administered by the Indian government through a National Family Planning Institute and an Institute of Public Health and Administration and Education. The project also includes a \$255,000 grant to the Institute of International Education for 30 1-year fellowships to train Indian students for work in the government's family-planning program.

The grants also included appropriations to the Tunisian government, at its request, to establish 12 centers for an experiment in family planning. In the U.S. grants included funds to the University of Chicago for graduate training and research by Americans to help less developed nations plan, set up, and evaluate population-control programs; funds to the Columbia University College of Physicians and Surgeons for research on the functions of the human ovary; a matching grant to the Population Reference Bureau to help expand the distribution in the U.S. and abroad of educational materials on population studies. The grants totaled \$7,558,500.

A joint **investigation of the Amazon River** is being carried out by the U.S. and Brazil in an attempt to measure the river's rate of flow and the amount of sediment it transports to the sea. The project is part of a worldwide study of the salt balance and chemical flux of the world's oceans. A U.S. Geological Survey team is working with the Brazilian navy's hydrographic office and the Centro de Pesquisa de Geografia do Brasil, of the University of Brazil. The U.S. team is headed by Roy E. Oltman of the Survey's water resources division, and the Brazilian effort is being led by Fernando M. de Andrade, a researcher at the University of Brazil.

Meeting Notes

A symposium on **isotope mass effects** in chemistry and biology is scheduled 9–13 December in Vienna. It will be sponsored by the International Atomic Energy Agency and the Joint Commission on Applied Radioactivity. Papers are invited on theory and interpretation of isotope effects, experimental techniques, isotope effects on chemical and biological systems in equilibrium, and kinetic effects. Abstracts of the papers must be 250 to 350 words in length. Deadline for receipt of abstracts: 1 September. (U.S. scientists should direct inquiries to: J. H. Kane, International Conferences Branch, Div. of Special Projects, U.S. Atomic Energy Commission, Washington 25)

The reactions of **proteins** in foods is the theme of a symposium sponsored by Oregon State University, 4–6 September. Topics to be discussed include protein structure, reactions and interactions and their control in man's food supply, food allergens, metabolic antagonists, and possible toxicological aspects of protein complexes. (A. F. Anglemier, Dept. of Food Science and Technology, Oregon State Univ., Corvallis)

The U.S. Public Health Service will present its 13th **instrument** symposium and research equipment exhibit 7–10 October at the National Institutes of Health, Bethesda, Md. Discussion will center around atomic absorption spectroscopy, automation in biochemical analysis, methods of molecular structure analysis, new methods in immunochemistry and immunology, high-resolution microscopy, advanced x-ray and electron technique spectroscopy, molecular separation by size and charge, and physiological monitoring. Advance registration is not required. (J. B. Davis, NIH, Bethesda 14, Md.)

Courses

Wayne State University plans a fall institute on experimental **stress analysis** and mechanical behavior of materials in design. Three separate programs will be conducted, and participants may register for any individual or combination of programs. The following will be included: photoelasticity, 9–13 September, \$200; strain gages, 16–20 September, \$200; and mechanical behavior of