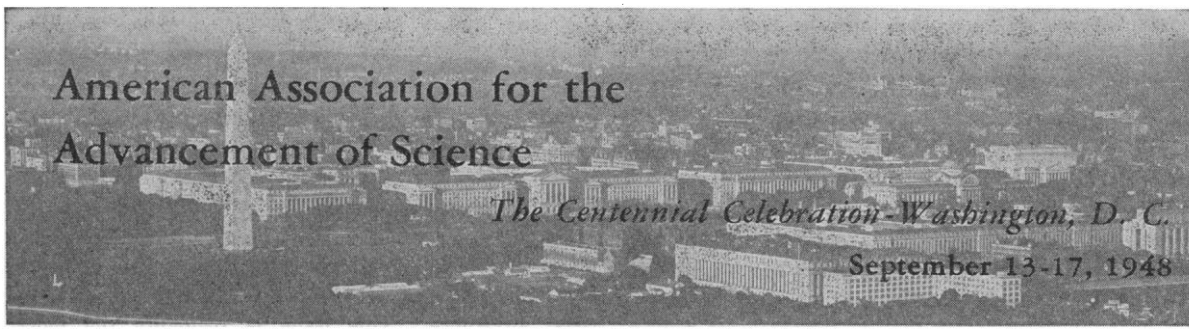

The National Bureau of Standards

The National Bureau of Standards, established in 1901, is the principal agency of the Federal Government for fundamental research in physics, mathematics, chemistry, and engineering. With a staff of 2,800 (including 1,200 scientists and engineers), grounds totaling 68 acres, and 95 buildings (20 major, 75 minor), it consists of 13 scientific and technical divisions, 1 concerned with commodity standards, and 4 concerned with administrative and plant matters.

The activities of the Bureau, coinciding with the range of the physical sciences, are diversified and extensive. Three broad categories summarize the type of work done: research and development; test, calibration, and standard samples; and advisory services. In general, each of the divisions and sections of the Bureau is engaged in all of these phases.

The administrative staff consists of the director, E. U. Condon, and his office: E. C. Crittenden and W. R. Brode (associate directors), D. I. Vinogradoff and Hugh Odishaw (assistants to the director), and T. B. Morrow (executive officer). A few of the projects of the Bureau, listed under divisional headings, will indicate the nature and scope of the work.

Electronics (Harry Diamond, chief): The chief programs involve (1) electron tube research, development, and standardization; (2) physical electronics research; (3) electronic instrumentation; (4) electronic circuits and controls; and (5) electronic computers. Investigations are under way on thermionic and secondary emission, electron microscopy, ultrasmall electronic circuits, high-frequency micrometers, input and output transcribers for digital computing machines, cathode metal impurities, and printed circuits.

Applied Mathematics (J. H. Curtiss, chief): A centralized program in mathematics and electronic computing machines is in progress with the cooperation of the Office of Naval Research and other government agencies. Highly specialized mathematical tables, such as spherical scattering functions for complex arguments, spherical Bessel functions, confluent hypergeometric functions, and tables of intensity functions for complex indices of refraction, are prepared. Considerable work in applying modern statistical inference to complex engineering experiments and sampling problems is performed.

Radio Propagation (Newbern Smith, acting chief): Basic Radio Propagation Predictions are issued monthly. Research projects include basic microwave, frequency utilization, and ionosphere research, behavior of high-frequency direction finders, cosmic and atmospheric noise, sunspot predictions, and fundamental work in standards and measurements.

Mechanics and Sound (W. Ramberg, chief): Projects include thermal-noise thermometers, measurement of hearing-aid gain, oscillation of quartz plates, sound insulation in building structures, liquid oxygen for aircraft use, turbulent boundary layer investigations, flood waves, the development of aeronautical instrumentation of various kinds, and others.

Electricity and Optics (F. B. Silsbee, chief): Projects in electricity include standards of direct capacitance of very small magnitudes, electrical surge measurements, underground corrosion, batteries and dry cells, magnetic measurements, and basic research in the field of resistance, inductance, and capacitance standards and measurements. Work in optics includes a wide variety of investigations in spectroscopy, interferometry, photometry, colorimetry, polarimetry, and optical instruments.

Atomic Physics (E. U. Condon, chief): Work in this field includes tracer micrography, the compilation of atomic energy levels, the development and calibration of beta-ray standards, the preparation of microgram radium gamma-ray standards, investigations of radiation hazards, X-ray protection barriers, the action of penetrating radiation on biological matter, and other basic research in atomic and subatomic physics.

Heat and Power (F. G. Brickwedde, chief): Basic work in thermodynamics, including cryogenics and temperature measurement, automotive and aircraft engines, and lubricants and fuels is conducted. Typical projects involve the analysis of recycle styrene, aviation gasoline hydrocarbons, high-altitude brush wear, jet boring tools, pyrometers for gas turbines, heat capacity of certain gases, and others.

Metrology (W. Souder, chief): Basic length, mass, time, and capacity and density measurement, instrumentation, and standards problems constitute the bulk of activity. New secondary standards of mass, precision plain ring gages, and angle gage blocks, surface strain in plastic dentures, flow nozzles, precision ruling of circles, and thermal expansivity are some of the projects carried on.

Chemistry (G. E. F. Lundell, chief): A wide range of work in organic, analytical, and physical chemistry is performed, including carbon monoxide indicators, heats of formation of certain hydrocarbon compounds, fractionation and analysis of hydrocarbons in petroleum, standard samples of hydrocarbons, benzoic acid thermometric standard, and electrodeposition.

Organic and Fibrous Materials (A. T. McPherson, chief): High polymer research includes studies of the viscosities of dilute solutions of high polymers in solvent-precipitant mixtures, shape of long chain molecules, copolymerization reactions, and the interaction between polymers and liquids. Other typical projects include research on synthetic and natural rubbers, cellulose and cellulose derivatives, water-repellent fabrics, resin-bonded plywood, and performance of plastics.

Mineral Products (H. Insley, chief): Applied and fundamental research is conducted in porcelains, pottery, glass, refractories, enameled metals, concreting materials, masonry and reinforced concrete, lime and gypsum, and building stone. Specific investigations include ceramic coatings for high-temperature protection of low-carbon steel, concretes containing admixtures, exposure of concrete, new optical glasses, wool fibers, and the constitution of mineral products.

Metallurgy (J. G. Thompson, chief): Many studies in ferrous and nonferrous metallurgy are conducted, e.g. influence of boron on steels for armor plate, repair of porous castings, preparation of magnesium castings, resistance to corrosion of light metals for aircraft, stabilization of chromium-nickel steels, basic principles of powder metallurgy, X-ray metallography, and studies of gases in metals.

Building Technology (D. E. Parsons, chief): Simultaneous investigations of the properties of building materials, structural strength, fire resistance, acoustics and sound insulation, heating, ventilating, and air conditioning, durability and the exclusion of moisture, building and electrical equipment, and miscellaneous projects in the building field are carried on.

On Wednesday, September 15, those attending the Centennial Celebration will have an opportunity to tour the Bureau and other laboratories engaged in work in the physical sciences.

NEWS and Notes

Herbert R. Morgan has been appointed associate professor of epidemiology in the Section of Public Health Laboratory Practice, School of Public Health, and assistant professor of internal medicine in the Medical School at the University of Michigan. Dr. Morgan has recently been working as senior fellow in virus diseases, NRC, at the Thorndike Memorial Laboratory of the Boston City Hospital.

Hugh W. Terhune, administrator of the Philippine Fishery Program of the Fish and Wildlife Service, has been appointed honorary adviser on fisheries to the Philippine Government by President Elipidio Quirino. In 1946 he was appointed to organize and administer the Philippine Fishery Rehabilitation Program.

Robert J. Wherry, vice-president of Richardson, Bellows, and Henry, consulting psychologists, has been appointed to the staff of Ohio State University's Psychology Department, effective October 1.

Arthur Bevan, principal geologist of the Illinois Geological Survey and chairman of the Division of Geology and Geography, National Research Council, is continuing during August his field research on the Pleistocene glaciation and geomorphic evolution of the northern Rocky Mountains. The customary field work in Montana will be supplemented this season by special studies in western Alberta and eastern British Columbia.

William E. Gordon, former research consultant for the Minneapolis Regional Office of the Social Security Administration, was recently appointed professor of research at the Nashville School of Social Work, graduate school for professional social workers which is operated cooperatively by Vanderbilt University and Scarritt and Peabody Colleges.

Walton B. Sinclair, staff member of the Division of Plant Physiology at the University of California Citrus Experiment Station, Riverside, for the past 15 years, was recently named head of the Division. Prof. Sinclair succeeds **E. T. Bartholomew,** head of the Division since 1935, who has retired.

Victor A. Drill was recently appointed professor of pharmacology at Wayne University College of Medicine. In his new position Dr. Drill is continuing his previous research in pharmacology and metabolic problems.

Robert M. Chew, of the University of Illinois, has been appointed to the staff of Lawrence College, Appleton, Wisconsin, as assistant professor of biology, effective in September.

Nephi Albert Christensen, dean of engineering at Colorado State College,