Mellon Institute Today

THE annual report, *Scientific Researches of Mellon Institute, 1953–54,* made by the president, Edward R. Weidlein, to the board of trustees, sets forth the investigational work and accomplishments in the institution that took place during the fiscal year ending 28 February 1954.

As an endowed nonprofit organization, the Institute seeks through adequate research in pure and applied natural science to acquire ideas and results that are of advantage to society. All the many investigational programs are for professional and industrial good and for human betterment. During the fiscal year, the expenditures for pure and applied research amounted to $4,375,712. Of this sum, $1,117,934 was spent for supporting projects in pure science on 11 fellowships and in the departments of chemical physics, physical chemistry, physical measurements, instrumentation, organic chemistry, and analytic chemistry.

In all, 131 members of the Institute were engaged in various pure science research programs. The applied science investigations were conducted by 65 other fellowships, on which 383 members have been employed. Two of the fellowships have been proceeding 40 yr; 5 are 35 yr old; 1, 30 yr; 1, 25 yr; 10, 20 yr; 19, 15 yr; and 5, 10 yr. There is a general trend to growth in the size of fellowships, and comprehensive fundamental projects are increasing more and more. The Institute's servicing staff has 208 additional workers. In the calendar year 1953 there came from departments and fellowships of the institute 12 bulletins, 55 research papers, and 56 other scientific articles. In the auditorium and conference and social rooms of the Institute meet many professional organizations of the district and also national scientific societies, allied associations, technical assemblies, and committees.

Pure research investigations have related to vibrational analysis of molecules, methods for calculating structure factors, measurement of crystallinity in elastomers, implementation of special diffraction techniques, and improvement of apparatus for thermal diffusion, distillation, and extraction. A digital computer is under construction, and a department of applied mathematics is being set up. For the *U.S. Pharmacopeia,* aromatic chemicals and surgical supplies are being studied. In microbiological researches, there has been gained a better understanding of the bacterium responsible for enhanced acid production from certain sulfuritic materials associated with bituminous coal and of the microorganisms that cause the deterioration of cellulosic textile fibers. Other pure science investigations have been concerned with air-pollution control, health of factory workers, pharmacology of potentially useful newly available chemicals, new orthopedic devices, basic physics and chemistry of the glassy state, and standardization.

Seven new applied science fellowships have been established during the year: aerosols, bituminous coal, carbon black, cleaning equipment, fatty alcohols, information processing, and Visking products. Twelve fellowships concluded their programs. Continued applied science fellowships are studying problems in watch manufacturing, fluid-flow measurements, selenium power rectifiers, organoclay complexes, structural clay products, and refractories. Dynamic properties of glass, improvement of vitreous enamels, fundamentals of abrasive grinding, and many projects in metallurgy constitute other programs. Nickel catalysts have had comprehensive investigation, and a short cut has been effected in the process for making metallic zirconium and hafnium. Wastes from the coal industry and from the manufacture of steel are securing much attention. The natural gas industry has benefited from gains in research on odorizing and underground storage. There are many important investigations in the field of petroleum: engine deposit studies, cracking research, sulfur investigations, and wax research. Advances have been made in the geriatric food program and in researches on solid adsorbents, insecticides, and corn products. A group of fellowships are investigating textile problems, embracing consumer goods, threads, industrial fabrics, and sleeping-bag fillers. Much advancement has been accomplished in synthetic organic chemistry, especially on new and improved resins and organic coatings, on silicones, and on finding and developing compounds for combating viruses and tumors.

W. A. HAMOR

Mellon Institute, Pittsburgh, Pennsylvania

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