

redounds to others beside the corporations or to the whole of society, as it often does, this circumstance does not alter the fact that the reason of the corporations for maintaining research establishments is primarily to improve their products and performance, and thus render their undertakings more successful for their stockholders. The greater part of the research conducted under the immediate sponsorship of the government is similarly directed toward definitely anticipating practical ends—the protection of the government as a consumer, the development of more effective weapons of defense, the improvement of agricultural methods, the development of cheaper or more abundant sources of power, and so on. The developmental or applied research of both industry and government may and often does contribute significantly to our knowledge and understanding of the universe, but its contribution is incidental to its main purpose.” . . .

“From the point of view of the nation as a whole,” Dr. Bush continued, “the bridge from fundamental discovery to practical application is not always and everywhere effective. Much of the fundamental work is done by universities, research institutions such as our own, and government; and all these are lame in moving forward to applications when they try to do so. It takes the resourcefulness and drive of competitive industrial effort to vault the many hurdles that are always present when novel methods or devices are introduced into the current scene. To introduce a new method or device requires the expenditure of venture capital, which is not available in the ordinary sense to public or semi-public institutions. There is nothing wrong about a fundamental idea's flowing out of laboratories such as ours and later becoming a matter of vigorous industrial exploitation if it is all done within the framework of the law and with proper regard for the public interest. We believe in private enterprise in this country even though some of our citizens often give the contrary impression. But in our system of private enterprise it is not entirely clear where the burden of the initiative lies for bringing a promising idea to the point where it will be exploited. And consequently there is often a long wait before industry on its own initiative takes effective action. We have, in a word, no effective organization in the country as a whole for bringing the fruits of disinterested research to the point where they invite industrial development.”

Illinois Summer School

Semiconductors and Transistors

Detailed plans for the Summer School on Semiconductors and Transistor Electronics to be held at the University of Illinois (Urbana) are nearing completion, according to John Bardeen, professor of physics at the university, who is chairman of the arrangements committee. He is aided by six representatives of cooperating companies—B. H. Alexander of the Sylvania Electric Products Company, O. S. Duffendack of Philips Laboratories, M. H. Hebb of GE, J. A. Morton and

William Shockley of Bell Telephone Laboratories, and Albert Rose of RCA Laboratories—in addition to Professors Robert J. Maurer, John D. Ryder, and Frederick Seitz of the university departments of physics and electrical engineering. The university's division of extension is also collaborating.

In charge of the three courses making up the program of the Summer School are Dr. Maurer (Semiconductor Materials), Dr. Bardeen (Transistor Devices), and Dr. Gilbert H. Fett (Transistor Circuit Fundamentals). Lecturers include the course directors: Dr. Seitz; Dr. Shockley, R. M. Ryder, and R. L. Wallace, Jr. of the Bell Laboratories; R. N. Hall and J. S. Schaffner of GE; a Philips staff member yet to be chosen; Albert Rose and H. Johnson of RCA; E. Conwell of Sylvania; and Erwin K. Weise of the University of Illinois.

The school will be part of the summer session of the university, so that graduate-level academic credit can be given if desired. Inquiries should be addressed to the Department of Electrical Engineering, University of Illinois, Urbana, Illinois.

Miscellany

Division B (physics) of the American Association for the Advancement of Science is under the chairmanship this year of George R. Harrison, dean of science at the Massachusetts Institute of Technology. The post carries with it the title of vice president of the AAAS. Edward U. Condon, director of research at Corning Glass Works, has become president of the Association for 1953, and Warren Weaver, of the Rockefeller Foundation, has been named by the AAAS as president-elect. Dr. Weaver will take office in 1954.

Franklin L. Burr Awards were presented in December by the National Geographic Society to Harold E. Edgerton, professor of electrical engineering at the Massachusetts Institute of Technology, for his invention of the stroboscopic speed light for photography, and to George van Biesbroeck, professor emeritus of astronomy at the University of Chicago, “in recognition of his accomplishment in finding new proof of the bending of light from stars in support of the Einstein theory of relativity”. Dr. van Biesbroeck led an expedition, supported by the Society in cooperation with the U. S. Navy and Air Force, to the Anglo-Egyptian Sudan in order to obtain photographs of the star field behind the sun during the total eclipse of February 25, 1952. He returned to the spot on August 29 and obtained additional photographs of the identical star field at the moment it reached the same position it had occupied at the time of the eclipse. Comparisons of the two sets of photographs, according to the Society, gave evidence that the path of starlight indeed shifts in passing close to the sun.

A survey conducted by the Southern Association of Science and Industry, according to a story appearing in *The New York Times*, has shown that more than one hundred new laboratories or major research additions

have been established during the past year in the southern states. H. McKinley Conway, Jr., director of the Association, reported that there were no major consulting research institutions in the South ten years ago, but that the region now has some forty consulting laboratories, about twenty-five commercial testing laboratories, and more than two hundred individual scientific consultants. Thousands of professional scientists are employed in the region and southern membership in technical societies, he reported, is now at an all-time high.

The University of Texas is setting up a radiocarbon dating program which will provide the Southwest with its first facilities for making use of the technique in determining the age of artifacts and other specimens of archeological interest. Leon O. Morgan will be in charge of instrumentation for the program.

The universe may be larger than it has looked, according to Harlow Shapley of the Harvard College Observatory. Ever since certain star clusters in the Magellanic clouds were found to resemble globular clusters in our own galaxy, he told members of the American Astronomical Society on December 30th, their apparent discrepancy in luminosity has been puzzling. Proposing tentatively that the globular clusters in the Milky Way and those in the Magellanic clouds be considered to be equally bright and therefore more distant from one another, Shapley suggested that the magnitudes of the Cepheid variable stars may actually be on the average nearly four times greater than has been assumed, with the result that the galaxies may be larger and farther away and that present estimates of their masses may be in serious need of revision.

Education

A survey by F. S. Endicott, director of placement at Northwestern University, has indicated that college graduates with technical training will have little difficulty in finding employment this year, but that employers are concerned over the continuing shortage of graduates in science and engineering. Last year industry was able to hire less than seventy percent of the graduates wanted, and prospects for 1953 are apparently not expected to be much better.

Radiological physics fellowships are being offered by the AEC for graduate study during 1953-54 at Vanderbilt University in cooperation with the Oak Ridge National Laboratory, at the University of Rochester in cooperation with Brookhaven National Laboratory, and at the University of Washington in cooperation with the AEC Hanford Works. In each case, nine months of course work at the university is followed by three months of additional study and field training at the cooperating AEC installation. Application forms for fellowships in radiological physics, which deals with health problems associated with the handling of radioactive materials and which encompasses radiation monitoring, radioisotope measurements, hospital physics, and related activities, may be obtained from the Fellowship Office, University Relations Division, Oak Ridge Insti-

tute of Nuclear Studies, P. O. Box 117, Oak Ridge, Tennessee.

Industrial research fellowships in physics, chemistry, electrical and chemical engineering, metallurgy, ceramics and minerals, and engineering mechanics are again being offered this year by the Armour Research Foundation, Illinois Institute of Technology. Research fellows will attend the Institute half-time and work in the Foundation half-time in a graduate program leading to advanced academic degrees; they will be employed full time by the Foundation during the summer. Awards are made to U. S. citizens under 28 years of age holding a bachelor's degree from an accredited engineering or scientific school or a liberal arts college with a major in the sciences. Application forms can be obtained from the Office of Admissions, Graduate School of Illinois Institute of Technology, 35 West 33rd Street, Chicago 16, Illinois.

Applications for admission to the 1953-54 sessions of the Oak Ridge School of Reactor Technology (which begins next September) must be submitted to the school not later than March 1, according to information from Union Carbide and Carbon Corporation, operator of the AEC's Oak Ridge National Laboratory where the twelve-month course will be given. F. C. Von der Lage, the school's director, points out that the curriculum has been expanded and improved over previous sessions, and the faculty has been increased for the 1952-53 class. The following subjects, in all of which reactor science is emphasized, are currently scheduled to be taught: analysis and mathematics, engineering, chemistry and technology, materials, nuclear physics, experimental physics, and technology. Students are selected by a committee on admissions from two categories: nonsponsored recent graduates, and sponsored students from industries and government agencies. Brochures describing the 1953-54 session and application forms for admission are available upon request from the Oak Ridge School of Reactor Technology, P. O. Box P, Oak Ridge, Tennessee.

Mount Holyoke College has announced the establishment of an agency of the college to be known as Industrial Associates for Women in Science, a collaboration of science, industry, and the liberal arts which will include industrialists, scientists, and members of the college. The agency will seek to develop projects in education, teaching, and research to which industry may contribute both as a public service and in its own interest, and which will advance the educational aims of the college.

Industry

Continued investment in industrial instrumentation in 1952 showed a ten percent rise over 1951, according to a year-end statement by Henry F. Dever, president of the Brown Instruments Division, Minneapolis-Honeywell Regulator Company. All indications, he added, are that the trend will continue toward wider use of instruments and automatic control equipment by