Science and the Sea

Astronomy led to celestial navigation, and the more recent science of radio astronomy is on its way to improving the lot of mariners even further. A recent announcement by the Naval Research Laboratory, which worked in collaboration with the Collins Radio Company of Cedar Rapids, gives some details of a "radio sextant" that has been developed to detect radio waves from the sun. The angular coordinates of the sun can be determined during the day from solar noise regardless of the weather in this way, and the information can then be converted to give the ship's position in a conventional manner. The antenna for the device is a three-foot diameter dish which "locks on" the sun and tracks it continuously while it is above the horizon.

A less successful venture of science in conquering the sea occurred in this year's Bermuda Race (for sailboats, run from Newport, Rhode Island, to St. David's Head, Bermuda, a distance of 675 miles). One of the contenders subscribed to a meteorological consulting service for help in predicting the weather to be encountered. Knowing the winds along the way in advance would permit laying out an optimum course, according to plan. The boat, *Desiree*, finished thirty-fifth.

Renouncing unilateralism in the field of measurement, the National Bureau of Standards has just decided to replace the U. S. Nautical Mile of 1853.248 meters with the International Nautical Mile of 1852 meters. The action was taken following an official agreement between the Secretary of Commerce and the Secretary of Defense to use the international mile in their departments. The British and U. S. nautical miles were derived by taking sixty nautical miles per degree of latitude, but the values adopted were not the same. The nautical mile adopted by the British Admiralty equals 6080 British feet, while the U. S. nautical mile has had the adopted value of 1853.248 meters, from which the equivalent 6080.2 U. S. feet has been derived. The British foot is shorter than the U. S. foot by one part in 400 000, an amount, according to NBS, which is of no importance in the ordinary transactions of everyday life but which is very important in precise measurements. Nautical measures that have been used elsewhere in the world have given as few as ten miles per degree. The International Nautical Mile was agreed upon in 1929, at which time it was adopted by most countries other than the United States, Great Britain, and the U.S.S.R.

AEC Research Contracts

Seventy unclassified research contracts with universities and private research institutions have been announced by the Atomic Energy Commission, of which the great majority represent renewals of contracts previously in force. New contracts are as follows: University of Chicago (investigator, C. A. Hutchison, Jr.), for work on paramagnetic resonance absorption, $27 235; Cornell University (F. A. Long), kinetic and equilibrium salt effects, $10 778; University of North Carolina (K. Knox), preparation and properties of compounds of technetium and rhenium, $11 450; University of Notre Dame (B. Waldman), assistance in remodeling of electrostatic generator, $30 000; Vanderbilt University (C. D. Curtis), transfer of ORNL Cockcroft-Walton to Vanderbilt University, no fund contract; University of Virginia (F. L. Hereford), interaction of polarized photons with matter and other research with 1 Mev Van de Graaff, $37 500; and University of Wisconsin (J. O. Hirschfelder), quantum mechanical and semi-empirical determination of intermolecular forces, $19 500.

Gadgetry

A new type of seal-off valve for high-vacuum work has been developed at the National Bureau of Standards that possesses a number of advantages over present methods of sealing off vacuum systems. The valve is designed so that its handle and stem can be removed, leaving only the closed valve seat on the apparatus. A permanent tap is provided that can be connected to a pump. The new valve, which was invented by R. J. Richards of the NBS staff, should prove convenient in many applications requiring the reversible sealing-off of all or part of a vacuum system.

Details of the first electric power plant to be fueled with uranium are given in an article in the July *Mechanical Engineering* by Charles H. Weaver, manager of the Atomic Power Division of Westinghouse. The plant, to be built by Westinghouse for the Duquesne Light Company of Pittsburgh, is designed to produce 60 000 kw of usable power, and will have ten tons of enriched uranium in its reactor core. Ordinary water is to be the coolant and moderator, and the main cooling system will operate at 525° F and 2000 psi to prevent boiling and cavitation. Four separate steam generators are included in the specifications, three providing the rated plant output and the fourth serving as a spare. The Foster-Wheeler Corporation and the Babcock & Wilcox Company will build two apiece, with each firm using a different design in order to evaluate their merits. The terms of the over-all arrangement between Duquesne and the Government provide that Duquesne will provide the site for the project, build the generating plant, contribute $5 million toward the cost of the reactor, and will operate the entire plant at no cost to the Government.

An x-ray microscope able to magnify up to 1500 diameters has been developed at the General Electric Engineering Laboratory at Schenectady by Sterling P. Newberry and Selby E. Summers. Described at the recent London meeting of the International Council of Scientific Unions, the instrument is expected to be of immense value in all branches of science. In the study of alloys, the mixture of materials can be identified by their relative "x-ray absorbing power" and in the study

of heredity, using the fruit fly, internal organs can now be observed in three dimensions—these are only two examples of the uses to which the microscope may be put. While a conventional x-ray source cannot be made less than about one-eighth inch in diameter, the G-E microscope uses an x-ray source only 100 000ths of an inch, achieved by focusing electrons through two electrostatic lenses which are essentially doughnut-shaped metal rings to which voltage is applied. The wavelength of x-rays can be changed without changing focus, making it possible to vary the contrast of pictures. The instrument employs a built-in camera that provides developed photographs immediately after a subject is exposed, and is unaffected by magnetic materials.

William O. Bateson, physicist in the atomic power division of the Westinghouse Electric Corporation of Pittsburgh, died on August 6th at the age of thirty. He served with the Army Signal Corps during World War II and was graduated with honors from Sheffield Scientific School, Yale University, in 1945. He completed his studies at Yale, obtaining his MA in 1946 and his PhD in 1948. He was a member of the American Physical Society.

Isaac H. Godlove, senior physicist for the General Aniline and Film Corporation, died in Easton, Pennsylvania on August 14th. He was sixty-two years old. A graduate of Washington University in St. Louis, he received his PhD from the University of Illinois in 1926 after eleven years of teaching at the Missouri State Normal School and the University of Oklahoma. He then served until 1930 as director of research for the Munsell Color Company of Baltimore, and was later associated with the Color Services Laboratories in Washington and with E. I. du Pont de Nemours & Co. before joining General Aniline's central research laboratory in 1943. A member of the Optical Society of America, Dr. Godlove was a former chairman of the Intersociety Color Council and for the past seventeen years served as editor of the Council's newsletter.

Floyd L. Nutting, professor of physics at Drexel Institute of Technology, died on August 7, at Jefferson Hospital in Philadelphia after a short illness. He was sixty-six. Dr. Nutting came to the Institute as assistant professor of physics in 1929. He was appointed associate professor in 1946 and professor in 1947. Born in Russell, Kansas, Dr. Nutting completed his MS degree in physics at the University of Kansas in 1924 and his PhD in physics at the University of Chicago in 1929. During World War I he served with the U. S. Army Air Force. Before coming to Philadelphia he taught in secondary school in Montana and, from 1926–28, at State College, Conway, Arkansas. He was a member of the American Association of Physics Teachers, the Physics Club of Philadelphia, and several other scientific organizations.