

OBITUARIES

Frits Zernike

The winner of the Nobel Prize for Physics in 1953, Frits Zernike, died on 10 March in Groningen, The Netherlands, at the age of 77. He won the prize for inventing the "phase-contrast" microscope, an instrument that is widely used in biological and crystallographic studies.

Zernike was born in Amsterdam. Both his parents were teachers of mathematics and his interest in science developed early in life. While still in secondary school he devoted his spare time to performing experiments, many of them with home made equipment and chemicals. He entered the University of Amsterdam in 1905 and studied chemistry, with physics and mathematics as minor subjects. A few years later he received a gold medal from the University of Groningen for a prize essay on probability. In 1912 the Dutch Society of Sciences at Haarlem, among whose jury members were Lorentz, Van der Waals, and Haga, gave him an award for a paper on critical opalescence that later formed the basis of his doctor's thesis.

Zernike joined the faculty of the University of Groningen as a lecturer in theoretical physics in 1915. Five years later he was named professor of theoretical and technical physics and occupied that position for the rest of his career.

Many of Zernike's investigations culminated in inventions, including the Zernike galvanometer, electromagnets and instruments for infrared and ultraviolet spectroscopy. He is best known, however, for his invention of the phase-contrast microscope, which exploits interference effects to make transparent objects visible against a transparent background. In the phase-contrast method, the phase shifts undergone by light passing through a "phase object"—that is, one that leaves the amplitude of the passing light virtually unchanged—are used to make the object visible. When Zernike took his invention to the Zeiss Works in Jena in 1932, the scientists and engineers were not very enthusiastic. He was told, "If this had any practical

value, we would ourselves have invented it long ago." Ironically, it was the German Wehrmacht, which was then patrolling the streets of his native Amsterdam, that finally placed the phase-contrast microscope in production as a result of a survey undertaken in 1941 of all inventions that might have military applications. Since then, thousands of the instruments have been manufactured.

Zernike was a member of the Royal Netherlands Academy of Sciences, an Officer of the French Legion of Honor and a foreign member of the Royal Society and a winner of its Rumford Premium.

Friedrich Georg Houtermans

The organizer of the modern physics-research center at the University of Bern, Friedrich Georg Houtermans, died on 1 March. He had gone to Bern as *ausserplanmässiger* professor in 1950.

Houtermans was born in Danzig in 1903 and grew up in Vienna. He studied at Göttingen under James Franck, receiving his PhD there in 1928. For a time he taught at the Technische Hochschule in Berlin, but because of his lack of sympathy for the National Socialist government he emigrated in 1933—first to England and then to Russia, where he served as scientific laboratory leader at a research institute in Kharkhov.

During the "purge" in 1937 Houtermans was arrested on suspicion of espionage for the Germans. He spent the next two and one half years in various prisons, sometimes in solitary confinement. He was never brought to trial. In 1940 he was returned to Germany with other scientists as part of an exchange for a number of Russian scientists held in German prisons. Nearly as suspect in Germany as he was in Russia, he spent the next several years working in areas considered remote from military applications at the private laboratory of Professor Manfred von Ardenne and at the University of Göttingen.

Houtermans wrote his dissertation on gaseous fluorescence. In 1929, in

coöperation with the British astrophysicist Robert d'E. Atkinson, he published a paper showing that energy production in stars could be explained in terms of proton capture by other nuclei, although he was unable to specify actual processes at the time. While in Berlin he did pre-laser work on the enrichment of upper energy levels in radiation fields.

A recurrent theme in Houtermans' research was the determination of the age of objects by measuring their isotopic ratios, and he made fundamental contributions to knowledge of the composition of lead. He estimated the age of meteorites by measuring the total amount of cosmic-ray-excited electrons released by heating the meteorites.

Another of Houtermans' specialties was nuclear theory. While he was working with von Ardenne—the laboratory was doing nuclear-instrumentation and electron-microscopy research for the German Postal Department—he wrote a paper on nuclear chain reactions in which he independently suggested that a reactor might produce a new fissile element (plutonium) that could be separated by standard chemical means.

When Houtermans came to Bern in 1950 the physics facilities there were meager and the activities of the department modest. At the time of his death, the Institute of Physics on Sidlerstrasse, which he directed, was one of the largest physics laboratories in Europe, with active projects in high-energy physics, meteoritic isotope determination, carbon-14 dating and nuclear geology.

Everitt P. Blizard

After a year-long illness, Everitt P. Blizard, director of the Neutron Physics Division at Oak Ridge National Laboratory, succumbed to leukemia on 22 Feb. He had been hospitalized since last November.

Blizard was born in Ottawa, Canada, in 1916. His family moved to Pittsburgh, Pa., a few years later and then to Garden City, N.Y. He received a bachelor's degree in chemistry from Wesleyan University in 1938 and a master's degree in physics from Columbia University in 1941.

Blizard went to ORNL in 1946 after spending the war years as a physicist with the Navy. He was named group