

obituary

Professor Heinrich Kaiser, the distinguished German spectroscopist, died unexpectedly in Dortmund on August 23, 1976, at the age of 69.

Kaiser was born on February 5, 1907, in Bochum. He studied physics, mathematics and chemistry at Münster, Freiburg and Köln and received his Dr.phil. in 1932. After a time as assistant to F. Försterling, in 1934 he joined the Carl Zeiss Optical Factories at Jena, where he worked on spectrochemical analysis. As a result of collaboration with W. Gerlach, W. Seith and G. Hansen he became involved in the problems associated with the precision of quantitative analysis, its instrumental and other limitations and its mathematical formulation. These problems remained one of his major interests for the rest of his life.

In 1947 he joined the State Institute for Testing Materials in Dortmund, where he set up a spectrochemical laboratory. Because of the lack of modern spectrochemical instrumentation in West Germany at that time, Kaiser set out to convince government and industry of the need for a research institute devoted to chemistry and applied spectroscopy, and in 1952 the 'Institut für Spektrochemie und Angewandte Spektroskopie' was opened in Dortmund with Kaiser as the first director. Kaiser continued to direct the Institute until his retirement in 1975.

Kaiser brought to the direction of the Institute a strong personality and many fruitful policies. Under his guidance, the Institute concentrated on those problems which cannot be solved by industrial or university laboratories alone. He also promoted an interdisciplinary approach, recruiting similar numbers of physicists and chemists for his scientific staff. He arranged 'workshops' for the training of scientists and technicians in new techniques and made welcome in the Institute many visiting scientists from abroad. He played an important role in the English-German cooperation which produced the *Documentation of Molecular Spectroscopy* (DMS). More recently he encouraged the publication of two new spectroscopic atlases: the *UV Atlas* and the *IR-Raman Atlas*. Under his direction the Institute at Dortmund achieved an enviable international reputation and a record of valuable contributions to the science and art of spectroscopy and of service to industry.

Kaiser also continued to make important personal contributions to the

theory of analysis. Himself a physicist, he came to the help of chemists by carefully defining various parameters for analytical procedures in several publications. His definitions of a *complete analytical procedure*, of the *limit of detection*, the *guarantee of purity*, of *selectivity* and *specificity* will probably be accepted as standard definitions in this field.

Kaiser's work received wide recognition. He was Honorary Professor of Physics at Münster University and Ordinarius at Dortmund University. He was president of the Deutscher Arbeitskreis für Spektroskopie and was active in several IUPAC and IUPAP committees. He was also an Honorary Member of the British Society for Analytical Chemistry and the recipient in 1973 of the Hasler Award of the Society for Applied Spectroscopy.

Kaiser had extensive knowledge and great love of music, art, literature and wine which he was happy to share with his friends. This keen interest in the arts manifested itself in many ways. For example he was chairman of the organisation "Friends of New Arts" and a member of the Administrative Board of the Northwest German Radio. Also through his decisive influence the Institute building at Dortmund is a model of good design showing that functionality need not exclude style.

It pleased him to show parallels in the development of science and the arts. For a concert of chamber music arranged for participants at the memorable XVIth Colloquium Spectroscopium International, over which he presided, in Heidelberg, in 1971, Kaiser found time to write a short essay comparing the development of music from Beethoven's *Septet in E flat major* (1799) to Webern's *Six Bagatelles* (1913) with the progress of physics from Laplace's treatise *Mécanique Céleste* in 1800 to Niels Bohr's theory of the hydrogen atom in 1913! And he even attempted a more direct synthesis of spectroscopy and music. For the opening of the new building for the Institute at Dortmund in 1962 he commissioned a musical composition based on a theme derived by an appropriate scaling down of the frequencies in the Balmer series in the spectra of the hydrogen atom. This composition became known as Kaiser's Wasserstoff Musik in affectionate contrast to Handel's Wasser Musik.

Kaiser's scholarship and industry will be much missed. Sadly he did not live to celebrate the 25th anniversary of the

Institute at Dortmund in 1977. Spectroscopists in many countries will hope that the Institute will continue to prosper. There could be no more fitting memorial to Kaiser's work.

D. A. Long

Evgeny Konstantinovich Zavoiskii, the distinguished Soviet physicist, died on October 9, 1976. His contributions spanned several fields of research and some thirty years of productive work. He was born in Mogilev-Podolskii, Ukraine, on September 28, 1907, and educated at the Kazan' State University, graduating in 1930. For the next 17 years he worked at the University, becoming Professor in 1945.

In 1944 he was the first person to observe electron paramagnetic resonance, using radio-frequency techniques and iron salts as the absorbing material. This work was carried out in association with S. A. Al'tshuler and B. M. Kozyrev at the Kazan' State University and exploitation of this powerful technique continued there after his departure to the Kurchatov Institute in 1947, the work being celebrated by a Jubilee Conference at Kazan', June 24-29, 1969.

At the Kurchatov he worked initially on solid scintillation detectors and in 1955 reported the first observations of particle tracks using image converters to amplify the light pulses. The Institute became involved in the quest for thermonuclear fusion, and as a consequence his range of interests extended. As a Division Head he was responsible for much of the early work on turbulent heating of plasmas.

In spite of working at the birthplace of the Tokamak, he was interested in other approaches to a viable fusion reactor and in 1968 suggested that relativistic electron beams could provide the energy input needed. This now ranks as one of the five approaches being actively pursued throughout the world.

He was awarded a Lenin Prize in 1957, was elected a member of the USSR Academy of Sciences in 1964 and received many other awards and honours. His contributions will be remembered by a wide range of scientists throughout the world.

R. N. Franklin