

## OBITUARY

SERGEI LEONIDOVICH MANDEL'SHTAM  
(2/22/1910-11/26/1990)

After graduation from Moscow University, Sergei Leonidovich Mandel'shtam began his scientific career working under the direction of G. S. Landsberg. His early work (1931-1932 in collaboration with G. S. Landsberg and M. A. Leontovich) was in the area of Raman scattering. Soon he and a group of coworkers shifted their interest to the analysis of atomic spectra, an area of urgent significance for Soviet industry.

In 1933, S. L. Mandel'shtam's first paper appeared. Co-authored with G. S. Landsberg and S. M. Raiskim, the paper is entitled "Quantitative determination of silicon in wrought iron." Up until the 1950's, Mandel'shtam and a group of co-workers worked on a far-reaching series of investigations which resulted in the establishment - well ahead of their time - of methods of spectral analysis of metals, the development of essential analytical apparatus, and the incorporation of spectral analysis methods into various areas of national industry.

The basis of the work of S. L. Mandel'shtam and his laboratory was the study of the processes of excitation of spectral lines and the physical characteristics of plasma sources of excitation. Investigations of flames, arcs, and sparks were the subjects of many papers of Mandel'shtam and co-workers who first studied spectral excitation processes in sparks and established original methods of spectral analysis such as fractional vaporization (associated with the analysis of atomic materials), the spectral analysis of gases in metals, and methods of analysis of roughened metals. At the beginning of the 1960's S. L. Mandel'shtam published several articles illuminating the limiting sensitivity of the analysis of emission spectra. These investigations were especially important in the articles regarding the analysis of pure materials used in several areas of industrial production.

In earlier work on spectral analysis S. L. Mandel'shtam had applied spectroscopic methods developed for astrophysics. Out of the results of space research the possibilities of permeation in the short-wave spectral region were discovered. From work on the spectra of multiply ionized atoms S. L. Mandel'shtam expanded the FIAN (Physical Institute of the Academy of Sciences) by the establishment of the Institute of Spectroscopy of the Academy of Sciences of the USSR. Over his remaining years, S. L. Mandel'shtam developed an interest in two closely related fields of spectroscopy: astrophysics in the x-ray region and laboratory studies of spectra in the vacuum ultraviolet.

Sergei Leonidovich and his co-workers obtained photographs of the sun in the x-ray region, discovered and established the polarization rules of sunlight in the x-ray region. This work received worldwide acclaim.

Much credit is given to Sergei Leonidovich for the development of spectroscopy in our country. For nearly 30 years he headed the Commission on Spectroscopy (Scientific Soviet) and for almost 20 years was the director of the Institute of Spectroscopy of the Academy of Sciences of the USSR, which had grown from a small laboratory of the Commission on Spectroscopy to a first-class institute. S. L. Mandel'shtam did much for the development of international scientific cooperation and was an editorial board member of the journal *Spectrochimica Acta*.

S. L. Mandel'shtam was considered an enormous authority by spectroscopists both in our country and abroad. Among his honors were his selection in 1979 as a corresponding member of the Academy of Sciences of the USSR, the State prize of the USSR in 1946 and 1977, the D. M. Rozhdestvenskii prize of the Academy of Sciences, USSR, and the KOSPAR prize for his space research. He was an honorary member of a series of foreign scientific societies. In addition to other orders and medals, S. L. Mandel'shtam was awarded the Order of Lenin.