Semen Efimovich Bresler (Obituary)

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Professor Semen Efimovich Bresler—doctor of chemical sciences, a talented scientist whose name is associated with the development of many fields of physics, physical chemistry, biophysics and molecular biology died on May 21, 1983 after a brief but serious illness.

Bresler was born on July 28, 1911. In 1930 he graduated from the Physico-mechanical Faculty of the Leningrad Polytechnical Institute. Already in 1929, having started work in the laboratory of N. N. Semenov, Bresler joined for many years the scientific staff of the Physico-Technical Institute. He regarded A. F. Ioffe, D. L. Talmud, Ya. I. Frenkel' and P. P. Kobeko as his teachers,

At the beginning of his scientific career Bresler worked in molecular physics and primarily on surface phenomena in liquids and at phase separation boundaries. He proposed original method which enabled him to study kinetic processes in monomolecular layers and the phenomena of linear wetting and linear adsorption. The results of this work formed the content of his doctoral dissertation "Molecular Forces in Surface Layers" which he defended in 1940. Together with D. L. Talmud he also published the monograph "Surface Phenomena."

Starting with 1939 Bresler turned to the study of the physics of polymers. His papers devoted to the configurational statistics of polymer chains carried out together with Ya. I. Frenkel' are widely known.

In 1940 Bresler headed a laboratory in the Physico-Technical Institute of the Academy of Sciences of the USSR, and later at the Institute of Macromolecular Compounds of the Academy of Sciences of the USSR. In those years he laid the foundations for the statistical analysis of processes of polymerization by the method of analyzing molecular-weight distributions. For the first time in our country he applied the ultracentrifuge for this purpose and made a significant contribution to the development of the theory and practice of ultracentrifuging synthetic and biological macromolecules. Subsequently he carried out a number of brilliant investigations in the physics and chemistry of polymers. Special mention should be made of the first systematic investigation of the thermal destruction of polymers utilizing, as one of the methods of analysis, the same statistical techniques as in the case of polymerization. Also in the 1960's Bresler together with B. L. Erusalimskiĭ prepared an original course on the chemistry and physics of polymers which is still being used by undergraduate and graduate students of many institutions of higher learning and of scientific research institutes.

Already at the beginning of the 1940's S. E. Bresler worked actively on the study of the structure of protein molecules. In 1944 together with D. L. Talmud he formulated and published a molecular theory of the structure of globular proteins which was many years ahead of similar papers abroad and the fundamental principles of which were invariably confirmed by numerous investigations of subsequent years.

SEMEN EFIMOVICH
BRESLER
(1911–1983)

This brief list of fields of investigation is by no means a complete reflection of the unusually broad range of the scientific interests of S. E. Bresler and provides clear evidence of his fantastic efficiency. It suffices to say that in the years following World War II when the problem urgently presented itself of catching up to the U.S.A. in the field of utilizing atomic energy S. E. Bresler took as his principal task specifically research in this field, primarily in radiochemistry and isotope separation. Much of the research mentioned above was carried out so to speak against the background of this activity which S. E. Bresler as a true patriot regarded as the principal one for himself.

Starting with 1960 S. E. Bresler with his characteristic enthusiasm and energy was one of the first in the USSR to begin, together with his colleagues in his laboratory, work in the field of molecular biology and continued to develop it at an unusually high level of activity until the very last days of his life. During these years he and his collaborators carried

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out well-known investigations in practically all the fundamental divisions of molecular biology. These investigations include: structure of nucleic acids of bacteria and bacteriophages; molecular mechanisms of elementary genetic processes: replication, recombination, reparation, transposition, mutagenesis; the mechanism of regulation of gene expression; mechanism of action; mechanism of reactions of fermentation proceeding with participation of free radicals; the structure and functions of biological membranes,—and this is far from a complete list of the lines of investigation in the laboratory of S. E. Bresler the results of which are held in high regard by specialists both in our country and abroad. Bresler is the author of the first in the USSR textbook "Introduction to Molecular Biology"—a book which has gone through several editions both in our country and abroad.

The tremendous scientific erudition and the research talent of S. E. bresler enables him not only to obtain fundamental theoretical results, but also to solve successfully important problems in the country's economy and in public health. During the Second World War he developed the technology of the production of a special kind of rubber and for this work was awarded the Order of the Red Star (1945). After the war he was the first to propose the use in factory practice of the methods of column chromatography to solve the problem of industrial purification of streptomycin and other antibiotics. From that time onwards all the streptomycin produced in our country is prepared using the technology introduced by S. E. Bresler together with G. V. Samsonov. He proposed to utilize chromatographic methods for the purification of viruses and headed the development of a large-scale production of millions of doses of chromatographic vaccine against the grippe, and later also against tick-transmitted encephalitis. In recent years Bresler directed the development of new methods of refining of petroleum and the creation of active interferon inductors that are safe for humans.

S. E. Bresler is the author of more than 300 articles and 4 monographs. His books have gone through many editions and have been translated into English, German, Japanese, Hungarian and a number of Slavic languages. Bresler participated unusually actively in the scientific life of our country and internationally. In the international scientific community he enjoyed well-deserved authority, was a member of editorial boards of four Soviet and four international journals, repeatedly presented papers and chaired meetings of All-Union and international conferences and symposia, and received invitations to give lectures abroad.

It is difficult to overestimate the contribution that Bresler made to the preparation of scientific manpower. Starting with 1945 he was a professor of the M. I. Kalinin Leningrad Polytechnical Institute. In 1976 he organized the department of biophysics in that institute. Among his pupils there are 8 doctors of science and over 30 candidates of science. In recent years while working at the B. P. Konstantinov Leningrad Nuclear Physics Institute of the Academy of Sciences of the USSR he headed a large scientific group consisting of more than 250 members,—the laboratory for molecular and radiation biophysics.

Bresler's life came to sudden end. It is difficult to become reconciled to the loss of this striking, talented, charming man in whose life science always occupied a most prominent place.

Translated by G. M. Volkoff