

VENIAMIN GRIGOR'EVICH LEVICH

On the occasion of his 60th birthday



Benjamin Levich was born on 30th March 1917 in Khar'kov where he was also educated. At Khar'kov University he studied under Landau who continued to supervise his postgraduate work at the V.I. Lenin State Pedagogical Institute in Moscow. With Landau he started work on interfacial phenomena. His doctoral thesis, completed at the age of 26, concerned the theory of the processes occurring in an electrolytic cell during the passage of current. This study led on to the general phenomenon of concentration polarization and the development of the rotating disc electrode as an electrochemical tool. This work brought him an international reputation and it probably remains the most widely known single piece of his work. During this period Levich joined Frumkin at the Institute for Colloid Chemistry and Electrochemistry (later the Institute of Physical Chemistry) of the Academy of Sciences of the U.S.S.R.

The first phase of Levich's work culminated in the publication of his book *Physicochemical Hydrodynamics* in 1952. This was revised and enlarged in 1959 and translated into English in 1962. It is a seminal work, since it is no exaggeration to say that this subject was created by Levich. The generalization of the theory developed in the first instance for electrochemical systems to problems of mass and heat exchange in engineering systems resulted from a masterly combination of theoretical physics with experimental science and engineering. This work resulted in his election to the Academy of Science of the U.S.S.R. as a corresponding member, and eventually to the creation for him of a chair of

Physicochemical Hydrodynamics at Moscow State University. He was removed from the latter in 1972.

Levich was also active in the teaching of theoretical physics. He previously held the Chair of Theoretical Physics at Moscow Physical Engineering Institute and it is notable that many of his distinguished associates and co-workers began their scientific life as his pupils. Besides being an excellent lecturer he is vigorous and lively in discussions, stimulating all around him to give their best. In 1954 he wrote an "Introduction to Statistical Physics", to be followed in the 1970's by a major work on Theoretical Physics published in English in translation from an earlier Russian edition.

In the 1960's Levich's work branched out into a great many directions with the help of a large group of co-workers. Some of this work has clear roots in his interest in hydrodynamics, like the theory of industrial catalytic reactors, fluidized beds, the problems of porous electrodes, and of semi-immersed electrodes. Others arise from his interest in theoretical physics like the theory of gas phase collision reactions, the development of a theory of the photo-emission of electrons from electrodes into solutions, the quantum-mechanical theory of electron transfer between ions in solution and between an ion and an electrode. Yet others arise from a combination of these interests with the stimulation of the electrochemical environment in the Institute of Electrochemistry of the Soviet Academy, the theory of noise in electrochemical systems, the theory of faradaic heterodyning, the statistical theory of adsorption at electrodes, the dynamics of charge transfer through the electrical double layer, the theory of the ring-disc electrode and the fundamental nature of biological charge transfer processes. A list of the published papers bearing his name appears at the end of this note. Many more have been stimulated by him.

The readers of this note will not need to be reminded of the present situation of this remarkable man. It is a tragedy that for five years he has been unable to use his great abilities to help his fellow men in his own country or elsewhere. The contributors to this issue hope that this unhappy situation will be resolved soon and that Benjamin Levich will be able to resume his scientific work to the full extent of his notable power. In the meantime they join with his many other friends throughout the world in celebrating his past achievements on his sixtieth birthday.

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