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Rickettsiologist Pavel F. Zdrodovskii: larger than life, and not just for his famous book

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Abstract

This article highlights the biography and scientific accomplishments of Pavel F. Zdrodovskii and his contributions to understanding the biology, pathogenesis, treatment, prevention and epidemiology of brucellosis, rickettsioses and many other infectious diseases.

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Russian rickettsiologist Pavel F. Zdrodovskii (Figure 1) is most known today for his famous book, *The Rickettsial Diseases* [1]. It was the seminal book in rickettsiology written in Russian in 1953 and was a masterpiece which he wrote at the peak of his scientific career; the second edition was translated into English by 1960. Last year was the 125th anniversary of his birth. The purpose of this note is to honor this great rickettsiologist by highlighting Zdrodovskii's biography and scientific accomplishments for contemporary microbiologists, as this detailed work still includes much information of basic interest from the pre-antibiotic and early era of antibiotics.

Zdrodovskii was born on 16 May 1890 in the city of Ural'sk (now in Kazakhstan). He received his primary and secondary education from a religious school and a seminary in Orenburg,

and he taught in a rural school before becoming a medical student at the Kazan University in 1909. When Russia became engaged in World War I in 1914, he was drafted into the army as a physician. After receiving his medical diploma in 1916 and his discharge from the army in 1917, Zdrodovskii directed the diagnostics, epidemic typhus and cholera departments at the Don Bacteriology Institute, Rostov-on-Don. He had a laboratory exposure that led to a severe case of epidemic typhus during that period. He joined the 11th Red Army as an epidemiologist after defending his doctoral thesis in 1920 and was assigned to work on malaria in Baku, Azerbaijan. After 2 years as an army epidemiologist, he proposed establishment of the Baku Institute of Microbiology and Hygiene and become its director in 1925. Zdrodovskii stayed in Azerbaijan until 1930. At the same time he served as an assistant and docent and later as a professor of microbiology at Baku University.

His work on malaria surveillance and control had a significant impact on the region, where 80% of newly arrived army recruits had malaria and paediatric malaria fatality rates reached 74.4%. His fundamental summary of the problem and proposed mitigations were published in *Malaria in Mugani* [2]. He organized massive wetland drainage efforts, leading to malaria elimination in the region. Other efforts focused on eradication of hookworm, which affected almost the entire rural population of Azerbaijan; production of vaccines against smallpox, cholera and rabies, and of immunoglobulins for treatment of whooping



FIG. 1. Portrait of Pavel F. Zdrodovskii.

cough, tetanus, scarlet fever and streptococcal and meningococcal infections [3]. During the same period Zdrodovskii started his exploratory research on brucellosis, among other topics; he focused on development of laboratory diagnostic methods and pathologic experiments in guinea pigs. This effort would be further expanded during his Leningrad (now St. Petersburg) and Moscow periods, when he established a brucellosis laboratory and a national network of brucellosis stations tasked with applied research on development of diagnostics, as well as prevention and treatment methods for brucellosis. This work was summarized in several books, including his groundbreaking monograph on brucellosis [4], which was recognized with The State Prize award in 1949.

From 1930 to 1934 he worked as the head of the epidemiology department at the Institute of Experimental Medicine in Leningrad, where his main focus was whooping cough vaccination and use of anti-*Bordetella pertussis* antitoxin.

In 1934 Zdrodovskii moved to Moscow, where he becomes the head of the epidemiology department in the newly established USSR Institute of Experimental Medicine [5]. At about that time he met his future wife and long-term collaborator, Dr. Helene M. Golinevich. This period was characterized by many accomplishments and new developments by the Institute of Epidemiology and Microbiology (1935–1937): organizing a network of brucellosis stations (1935–1937), establishing a booster whooping cough vaccination program (1935) and mandatory vaccination of army enlisted personnel against tetanus (1937). He was arrested in October 1938 on the basis of fabricated political accusations, and despite his denial he was convicted in 1939 to 10 years of prison with loss of his rights for 5 years and confiscation of his property. While still under arrest in 1940–1941 he was transferred to Kazakhstan to deal with the containment of an endemic focus of brucellosis; he was returned to the work camp after the campaign was completed. In early 1942 Zdrodovskii was relocated to Moscow, where he worked in the special laboratory for epidemic typhus. In 1944 he was released by decision of the Special Meeting of the People's Commissariat for Internal Affairs. In 1956 the Military Collegium of the USSR Supreme Soviet eventually withdrew the original charges for lack of evidence against him.

After the end of World War II in 1945 Zdrodovskii worked in the Institute of Epidemiology and Microbiology of the USSR Academy of Medical Sciences, where he continued his research on the immunology and epidemiology of brucellosis, typhus and other diseases. He was selected as chair of the department of experimental pathology and immunology in 1945, and the same year he was elected as a full member of the USSR Academy of Medical Sciences. He became the head of the newly established department of epidemic typhus and other rickettsioses in 1954

and was in charge of a practice-based research center of rickettsioses until his retirement in 1973.

Zdrodovskii contributed to understanding the biology of rickettsiae; to the ecology, epidemiology, pathology and immunology of rickettsial diseases; and to development of diagnostics and vaccines [6]. During that time his own work and that of the department at large contributed to vaccine development for Q fever and epidemic typhus, including creating live vaccines and establishing standards for the specific prophylaxis of all the rickettsial diseases known in the former USSR. The department established an extended collection of rickettsial isolates, including laboratory mutants. The results of these studies laid the groundwork for his famous book on rickettsiae and rickettsial diseases, later revised in collaboration with his wife, H. M. Golinevich. It was first published in Russia in 1953, and it was subsequently revised and updated in 1956 and 1972. The second edition earned them the Lenin Prize in 1959; it was translated into English and published by Pergamon Press in 1960 [1]. This continuous monumental effort earned Zdrodovskii more recognition both by the USSR government and from international colleagues, including an award from the French National Science Academy for typhus prophylaxis and his appointment as an expert for the World Health Organization.

Zdrodovskii's bibliography includes over 30 monographs and 500 articles, including work on clinical infection and immune responses to zoonotic pathogens; many of these publications are still relevant today, as they summarize fundamental information in the fields of his expertise. They provided the basis for education of two whole generations of productive rickettsiologists until the fall of the USSR. He attended the first international rickettsial meeting, held in Bratislava in 1967; the traditions of his school were continued by the members of his department, and they in turn shared their expertise and experience with Western rickettsiologists through the later rickettsial meetings in 1976, 1984, 1990 and 1996 in Slovakia and in 1987 in Sicily.

Conflict of Interest

None declared.

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