

## Remembering Zhores Medvedev, a multi-talented biogerontologist (1925–2018)

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In his life-time, Zhores Aleksandrovich Medvedev succeeded in two careers; firstly, as a research scientist, investigating and understanding the mechanisms of ageing in plants and animals. And the second

was investigative journalism, evolving from the repressive policies instigated by the Soviet government for science research. Here he, to his personal detriment, defended the truth by his determination to expose any misconceptions. He continued both of these interests until the end, saying, there was at least four more years of research and writing before he could finally retire.

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ZM interest in biology began at 15 whilst still at school in Tbilisi, the capital of Soviet Georgia where he first became fascinated by biographies of famous scientists “Microbe Hunters” (1926) by Paul de Kruif. His imagination was further sparked by Metchnikoff’s book on the “Prolongation of Life-optimistic studies” (1908), describing human ageing as a treatable pathology. He pursued his studies on the mechanisms of ageing while studying for his degree in plant physiology at the Timiriazev Moscow Agricultural Academy in 1943. His Professor, Petr Zhukovsky sent him to Yalta Crimea for 6 months to study the sexual processes in plants where he successfully published several papers.

At this time, Soviet science was in turmoil as TD Lysenko, with the full support of the government was opposed to the classical theories of genetic inheritance. Scientists who opposed this dogma were expelled. Professor Zhukovsky was not a supporter of “Lysenkoism”, but recanted to protect his students. In order to secure his position as a researcher, ZM realised he needed to obtain his Ph.D. Within a short time of obtaining his degree, he was able to use the data he had accumulated in the Crimea towards his thesis and was eventually awarded a Ph.D. a few months later in December 1950. He continued his research at the Timiriazev Academy on plant development, eventually extending this to study problems of senescence, focussing on the biosynthesis of proteins and nucleic acids. In 1961 he published the first paper proposing that ageing results from the accumulation of errors in protein synthesis and nucleic acids. These studies led to the publication of his book on “Protein biosynthesis and the Problems of Heredity Development and Ageing” (1963).

The continuing repression of genetic research led ZM to write a history of Soviet science where he criticized Lysenko for his bullying tactics and anti-Darwinian genetics. The manuscript was published underground, being circulated in ‘*samizdat*’. The Soviet authorities further increased applying pressure so ZM moved to conduct his research at the Institute of Medical Radiology in Obninsk in 1962. Here his interests in ageing developed further, as he realised that radiation was causal to ageing. He compared natural ageing to radiation-induced ageing. After “The Rise and Fall of TD Lysenko” was published abroad in 1969, ZM was dismissed from the Institute of Medical Radiology. He wrote and distributed in ‘*samizdat*’, a

collection of articles on the plight of Soviet science, which were eventually published abroad as “The Medvedev Papers” (1971). In May 1970 he was incarcerated in a psychiatric hospital because he was suffering from “paranoid delusions of reforming society”. The authorities released him after 19 days because of strong protests from colleagues abroad and prominent dissenters such as Sakharov and Solzhenitsyn. This experience was recounted in a book written by both Zhores and his identical twin brother, Roy “A Question of Madness” (1971).

ZM corresponded and exchanged ideas with many colleagues from abroad. He was invited to give a lecture at the Congress of Gerontology held in Kiev in June 1972 where he was to present his data on the age changes of nucleic acids and discuss some ideas on the re-iteration of genes for species specificity of lifespan. Soviet harassment persisted and he was banned from attending at the last minute. International colleagues attempted to reinstate him, to no avail. Shortly after, the director of his institute informed him that his invitation to study for 1 year in the laboratory of Robin Holliday at NIMR in London had been accepted. Early in 1973, leaving behind their elder son Aleksandr, ZM, his wife and son Dimitri, arrived in the UK, travelling 3 days by train from Moscow. Later that year when he applied to travel abroad his Soviet passport was confiscated leaving him a stateless citizen. ZM continued his studies on ageing at NIMR, investigating links to senescence and development, and finally concluding that senescence was multifactorial and comprehensive. He received two awards for his research in ageing; in 1984 from the United States Association of Biogerontology and in 1985- Rene Schubert Prize in Gerontology.

Concurrent with his scientific research ZM extensively investigated and exposed the nuclear explosion that occurred in the Urals in 1957 in his book “Disaster in the Urals” (1980). He was able by clever detective investigations; namely, high radiation levels, deteriorating animal populations and vanishing villages to pinpoint the explosion to Kyshtyn. When the Chernobyl explosion occurred in 1986 he detailed the incident and condemned Soviet management for the incident in “Legacy of Chernobyl” (1992). He continued to write extensively on the political situation in the Soviet Union, also publishing several books jointly with his brother Roy.

Upon retirement in 1991, he further pursued his interests on ageing and politics. One of these was to research and write a popular book on ageing, “Nutrition and Lifespan” (2007). This knowledge led ZM and his wife Margarita to maintain an allotment that sustained them with fresh produce and plenty of exercise. ZM a native of Tbilisi, always embraced Georgian culture, so in his home filled with Russian artefacts and many books written by the Medvedev brothers, Z and Margarita entertained their family and friends, providing a feast of Georgian and Russian cuisine with many long discussions on Russian politics and science.

After “*glasnost*” ZM maintained a pro-Russian stance writing many articles predominately in Russian, on the current political situation in Russia. He spent several years writing his autobiography of 115 chapters entitled “Dangerous Profession” published when he turned 90. His last book on ageing, unfinished at 15 chapters was on the problems of longevity. To the end, Zhores continued to follow his passion for knowledge and campaign for truth and integrity in society.

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