Boris Ivan Balinsky

10-9-1905 to 1-9-1997

Boris Ivan Balinsky was born in Kiev, Ukraine the older of two sons of Ivan Balinsky, a history teacher and Elizabeth Radzimovsky a biology teacher. They lived in a large flat in the town which was the centre of family life for the extended Balinsky household. A series of English governesses introduced them to the English language, the world of Lewis Carroll, popular nursery rhymes and tennis. History and music were prominent activities. Boris learned to play the piano and this led to his later interest in Wagner operas and ancient Russian folk songs.

Summer holidays were spent in the village of Severinovka, 80km south west of Kiev where his maternal grandfather, a Russian Orthodox priest lived. The country life with bee keeping, farming and harvesting were instrumental in directing his life towards the outdoors. A book which he received in 1916 by Akasov on collecting butterflies marked the beginning of his interest in zoology and the foundations for his future career. It was fortunate that Boris' curiosity in nature was encouraged prior to his formal schooling which started in 1917, the year of the Russian revolution. He found natural history a great disappointment as the teacher was very dull!

In 1923 he commenced his Zoology studies under the famous developmental biologist Prof I I Schmalhausen at the University of St Vladimir, which subsequently became the University of Kiev. A seminar which he presented on an embryological topic was to launch him into his career as an embryologist. He met his future wife, Katya Syngayevskaya at these seminars whom he subsequently married in 1928.

Balinskys undergraduate experiments soon earned him a reputation as a promising scientist. It was during his time at St Vladimir that he published his first scientific paper in 1925. He rose to the status of Professor of Embryology at the university by 1933 and deputy director of the Zoological Institute of the Ukraine Academy of Sciences. In addition to his embryological studies he obtained German lessons from an Austrian Serb, a language which was to stand him in good stead in the future.

From 1917 and for the next two decades life in the future Soviet Union was difficult for citizens. Severe food shortages were a daily uncertainty and friends and relatives were subjected to political repression and persecution by the communists. This culminated in the murder of Boris' much loved grandfather, the man who was so instrumental in fostering Boris' early interest in nature. Thus from the time that Boris commenced schooling, grew into adulthood and matured as a scientist this all occurred against a backdrop of turbulent times. It was fortunate that the President of the Ukrainian Academy of Sciences was held in high esteem by the Communist authorities as well as being a good man and true scientist. With his encouragement Boris' work was fruitful and productive. The personal happiness of Boris and Katya was increased by the birth of their son Ivan (John) in 1934. Sadly this well being came to an end with the Stalinist purges of 1937. Balinsky and his wife were subject to much harassment which culminated in Katya's arrest and internment in a labour camp for 18 months on counter-revolutionary charges . Boris lost his chair but was subsequently able to obtain another in the Medical School at Kiev where he was able to earn a salary and continue with his experiments. In March 1939 Katya was suddenly released with all charges against her withdrawn.

The conditions of life in Russia in the years 1940-1941 markedly deteriorated as compared with previous years. Food queues were usual for meat, butter and bread. Boris Balinskys standing in the scientific world was gradually improving after the setback it received from Katya's arrest. He was asked to edit two monographs, a long chapter on amphibian embryology and he started a textbook on comparative embryology. This last had to be aborted by the beginning of the

war with Germany. In December 1940 he received a formal distinction from the Academy of Sciences of the USSR in Moscow - the Kawalewsky Prize for his work on the determination of the endoderm in amphibian embryos.

The German attack on Russia found the Balinskys on holiday in the country. With no possibility of returning to Kiev they managed to get to Kharkov where fortunately he was able to regain his post as Professor of Zoology with the Kiev Medical School which was evacuated to Kharkov. In addition he was employed by the railways as chief of the rat catching division, a job requirement for this post being biological training! A perilous existence followed when the Germans overran the Crimea. The Balinsky family were ultimately able to return to Kiev where a hand to mouth existence followed in the bombed out city. As the war progressed and a future needed to be planned the idea of emigration to Western Europe and perhaps even to the United States became a consideration. Tragedy struck in early 1943 when Katya died of peritonitis after a short illness. Shortly thereafter Balinsky, his mother and Vania, together with many thousands of other Russians, were evacuated to Posen (formally part of Poland which was then under Nazi occupation). There he worked at the Fisheries Institute, but more importantly the move meant that he was closer to the Western front.

Several more relocations followed for the trio before the end of the war in 1945. Boris was appointed Professor of Histology in the temporary university established for displaced persons by the United Nations Relief and Rehabilitation Administration in Munich. It was here that he met and married his second wife, Elizabeth Stengel, in 1947. Later that year the university was closed down and he was offered an appointment in the Institute of Animal Genetics at the University of Edinburgh. During 1949 his daughter, Helen, was born and he also accepted a position as lecturer in the Zoology Department at the University of the Witwatersrand, Johannesburg. He had been attracted to Africa since his childhood days when animals fascinated him. The Balinsky family arrived in Johannesburg in September 1949. Within five years he was promoted to fill the chair of Zoology and headship of the department.

In 1956 Balinsky went to Yale University for his sabbatical leave where he was introduced to the two outstanding pioneers of biological electron microscopy, Drs Palade and Porter of the Rockfeller Institute in New York. With growing excitement he was able to apply the procedures and techniques of ultra-microscopy to his work on limb induction thereby solving a number of problems which had been hampering progress in this field of research. On his return to Johannesburg he was delighted to learn that the University of the Witwatersrand had in the mean time acquired a Siemens Elmiskop 1. This enabled him to continue with and develop his embryological studies using the electron microscope. In doing so he was the first person to practise biological electron microscopy in this country.

Boris Balinsky filled the chair of Zoology and headship of the department until his retirement at the end of 1973. He was Dean of the Faculty of Science from 1965 to 1967 and awarded the degree of DSc *honoris causae,* by the Witwatersrand University in 1978. He was a dedicated and productive researcher until he died. He has published over 100 research papers and a number of books, mainly in the fields of experimental embryology and entomology. A paper on the electron microscopic investigation of frog development was marked as a “citation classic” (most frequently quoted paper in its field) by the journal “Current Contents” in 1984. Even before World War II he had earned for himself a considerable reputation as a scientist. His first book, dealing with the development of the embryo was published in Moscow in 1936, his second on histology was published in Munich in 1947.

It was his experimental work on the induction of supernumary limbs by transplantation in the salamander, *Triturus,* that brought greatest international recognition and acclaim. However, his *magnum opus* a textbook entitled *Introduction to Embryology,* which was first published in 1960 was to cement his international reputation. The book was based on courses given to students at the University of the Witwatersrand. Such was its impact that it has been published in seven English editions, two Japanese, two Italian and one Spanish. It was certainly the most widely used embryology textbook in the world and has influenced the education of countless numbers of students.

One of the great achievements of Boris Balinsky was the manner in which he pioneered the application of the electron microscope to the study of ultrastructure of early development, how he foresaw the relevance of molecular biology to the understanding of development and the way in which he achieved a synthesis of these two approaches.

Balinsky was a man of many talents, many interests and many achievements. His abiding interest in insects which started in 1916 led to ongoing collecting of mainly stone flies, dragon flies, butterflies and moths. This resulted in him identifying, describing and naming several new species of the Families Odonata and Plectoptera. He was elected fellow of the International Institute of Embryology in 1947; fellow of the Royal Society of South Africa and was President of The Electron Microscope Society of Southern Africa for eleven years. In 1957 he was elected Chairman of the Zoology Section of the SA Association for the Advancement of Science. In 1966 he was President of the Entomological Society of Southern Africa. On his retirement he was appointed Professor Emeritus and Honorary Research Professorial Fellow by the University of the Witwatersrand in recognition of his many achievements. In 1984 he was awarded the status of Associate Member of the Transvaal Museum. Even in the last years of his life he pioneered yet another new field of study, the genetics of the butterfly *Acraea horta*.

Among his other interests were music, piano playing, oil painting, gardening and astronomy. He is one of the few people who have observed Halleys' comet twice. His deep love of animals and nature also led to extensive travels in the wilderness areas of Southern Africa , both with his family and with students from the Witwatersrand University.

Professor Boris Ivan Balinsky's contributions to science have been made in the fields of embryology, entomology, genetics and herpetology. He remains one of the best-known and most respected embryologists of the twentieth century.

The information on Balinsky up till 1949 comes courtesy of the Boris I Balinsky Memior, Record Series 15/35/57; University of Illinois at Urbana-Champaign Archives.

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