

Beritashvili, Ivane

Saturday, December 15 2012, 10:42 AM

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Citation:

Tsagareli, Merab G. (2006), *IBRO History of Neuroscience, Ivane Beritashvili (1884-1974)*, **IBRO History of Neuroscience** [http://www.ibro.info/Pub/Pub_Main_Display.asp?LC_Docs_ID=3443]

Accessed: date

Ivane Beritashvili (1884-1974)

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This article is dedicated to one of the outstanding neuroscientists of the 20th century - Ivane Beritashvili, the founder of the national school of physiology and neuroscience in Georgia. His most significant contribution was the discovery of the mediation of animal psychoneural behavior by image-driven memory. In 1958-60, together with Herbert Jasper, Henri Gastaut, Alfred Fessard and Vladimir Rusinov, he was one of the founders of the IBRO.

Ivane S. Beritashvili, the son of a priest, was born on 31 December 1884 in the small village of Vegini in Kakheti, in the Eastern region of Georgia (at that time part of the Russian Empire). He first studied for the priesthood at the ecclesiastic school in Telavi, the main city of Kakheti, and then at the theological seminary in Tiflis (Tbilisi), capital of Georgia. Because he came to dislike the prospect of becoming a priest, the young Ivane took examinations for the school-leaving certificate at the 2nd Tiflis gymnasium in 1906. In the same year he matriculated into the Natural Division of the Department of Physical and Mathematical Sciences of St. Petersburg University.

Beritashvili began his experimental research early, as a third year student under the supervision of the eminent Russian physiologist Prof. N.E. Wedensky (1852-1922), who was also the son of a priest and who had studied for the priesthood. The international neurophysiological community recognizes Wedensky for his discovery of the phenomena known in Russian as 'optimum' and 'pessimum.' In 1903, Wedensky proposed using the latter inhibitory phenomenon to explain the observation that increasing the frequency of peripheral nerve stimulation initially extended the excitatory response of nerve-muscle preparation but eventually resulted in a single contraction followed by complete relaxation ('Wedensky inhibition'). Beritashvili studied the problem of reciprocal innervation of skeletal musculature in frogs, showing that local strychninization of the dorsal horn did not disrupt the coordination of the 'wiping' reflex. The results of his first work were published in 1911. In the preceding year he graduated from the University and was invited by Wedensky for two and a half years and then for a further two years to work in the University Physiological Laboratory.



Figure 1: Ivane Beritoff as a student of St. Petersburg University (1910).

At the recommendation of Wedensky, Beritashvili left for Kazan in autumn 1911 to work with Prof. A.P. Samoilov (1867-1930) to master the method of registering electric currents in nerves and muscles by the string galvanometer. Samoilov had learned from Willem Einthoven (1860-1927) in Leiden in 1904. Later, in the spring of 1914, again with Wedensky's support, Beritashvili joined Rudolf Magnus (1873-1927) in Utrecht to study the techniques of mammalian neurosurgery (decebration, sectioning the dorsal roots, etc.), the principles of body posture and tonic neck and labyrinthine reflexes in mammals (later the Magnus-de Kleijn reflexes). At the start of World War I Beritashvili had to cease his research and return to St. Petersburg.

Mary A. Brazier recalled in August 1962, during the International Congress of Physiological Sciences in Leiden, when, accompanied by Otto Magnus and William Storm van Leeuwen, Prof. Beritashvili and his wife visited the grave of Rudolf Magnus: "As we stood among the trees, listening to the eulogy, read by Beritashvili in German, the memories of a happy scientific collaboration came across the intervening half-century with poignant nostalgia." And "Magnus's comprehensive book entitled *Körperstellung* had not been translated into English, but on that August afternoon in the Dutch graveyard Professor Beritashvili presented to Magnus's son a complete translation of this famous book into Russian" (Brazier, 1975, pp. 24, 26).

In 1915 Beritashvili had to leave St. Petersburg and move to Odessa as a Senior Assistant to Prof. V.V. Zavyalov, in the Division of Physiology in the Physical and Mathematical Department of Novorossyisk University. This Chair was established by Ivan M. Sechenov (1829-1905), regarded as the founder of Russian physiology, who had held the Chair for six years, from 1870 to 1876. One year later, after Beritashvili was appointed a private-docent, he began giving lectures in the course on the physiology of the nerve-muscle system. During that period he studied defensive reflexes in dogs using the method of V.M. Bechterev (1857-1928).

After the Russian Revolution in 1917, Georgia attained freedom and independence for the short period 1918-21. During this period, in 1918, Ivane Javakhishvili established the first University of Tiflis and Beritashvili received an invitation to organize its physiological department and the course instruction in physiology. In 1919 he set up this department and from then onward he succeeded progressively to develop intensive physiological teaching and research in Georgia. By 1920-21 he had published in Tiflis the first Georgian-language textbook on physiology in two volumes and with a practical guide, and in 1922 in the Russian language. At the same time, he founded a physiological research laboratory and started intensive work. Beritashvili thus realized what had been a mere dream for Ivane R. Tarkhnishvili (Tarchanoff) (1846-1908), the Georgian-Russian physiologist discoverer of the psychogalvanic reflex: to establish a laboratory in his native land. Tarkhnishvili had died in St. Petersburg the same year that Beritashvili came there as a student.

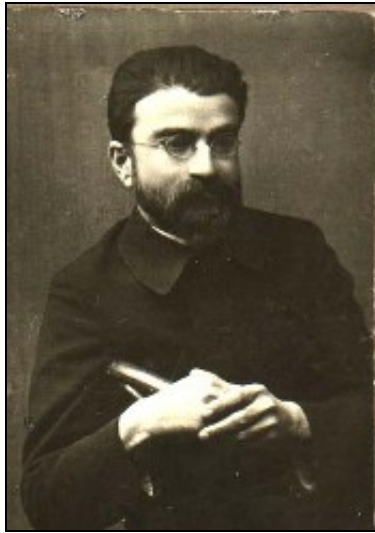


Figure 2: Ivane Beritashvili, a young professor of Tbilisi University (1920)

Later, in 1937, Beritashvili published in Russian a comprehensive handbook in Moscow entitled *General Physiology of Nerve and Muscle Systems*. For this book he was awarded the Stalin Prize in 1941. Later revised and enlarged - in 1947 and 1959 - this book guided many generations of 'Soviet' physiologists. A number of other fundamental handbooks, *General Physiology of the Central Nervous System*, the second edition in 1948 and the third revised and enlarged edition of 1966, and *Structure and Function of the Cerebral Cortex* (1969), were also published in Moscow in Russian.

In 1935, at the Tbilisi State University, Beritashvili established the laboratory of physiology in the Research Institute of Physiology, which now bears his name and honors his dedication to neuroscience. Later, in early 1941, the Institute affiliated with the Georgian Academy of Sciences. The Institute soon became a leading center for physiology and nervous system research in the Soviet Union and Eastern European countries. At the same time Beritashvili organized the publication of the *Transactions (Proceedings) of the Institute of Physiology*, the first volume of which appeared in 1936.

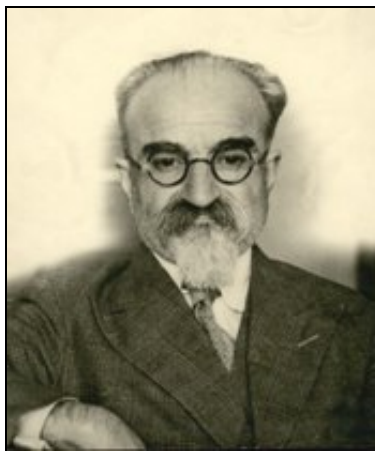


Figure 3: Ivane Beritashvili, founder of the Institute of Physiology (1935).

During this period Beritashvili was one of the organizers and founders of the Georgian Academy of Sciences. He was initially Head of the Biological Division of the Caucasian Branch of Academy of Sciences of the USSR (1933-41), and after the foundation of the Georgian Academy of Sciences he was Head of its Department of Biomedical Sciences (1941-74).

In 1938 Beritashvili was awarded the Pavlov Prize for important contributions to the study of the peripheral and central nervous systems, higher brain function, and animal behavior. In 1962 he was also awarded the Sechenov Prize for his book *Neural Mechanisms of Higher Vertebrate Behavior*,

which, with the support of H. Jasper, was translated from Russian into English and published in Boston (Beritashvili, 1965).



Figure 4: A group of participants at the 15th International Physiological Congress, Moscow (1935). Front row: I. Pavlov (2nd from left); I. Beritashvili (4th from left).

In 1939 Beritashvili established the Georgian Society for Physiology, Biochemistry and Pharmacology (since 1957 the Georgian Physiological Society). In the same year he was elected an Academician of the Academy of Sciences of the USSR, and in 1944 became a founding member and an Academician of the Academy of Medical Sciences of the USSR.

After World War II, Beritashvili arranged meetings in the style of symposia, later well known as 'Gagrskie Besedi' ('Gagra Talks'). The symposia took place in Gagra, one of the most picturesque resorts on the Black Sea coast in the west region of Georgia.



Figure 5: Participants at the first Gagra symposium (1948): I. Beritashvili (centre, fourth from left).

The third Gagra symposium, on the formation of temporary nervous connections in conditioned reflexes, was held only a few months before the exciting Moscow Colloquium in 1958 and served as a preparatory workshop or seminar for this Moscow meeting. The resolution formulated at the end of the Colloquium to establish an international organization for the study of the nervous system, signed by I. Beritashvili, H. Jasper, H. Gastaut and V. Rusinov, and passed by a unanimous vote of Colloquium delegates, is considered to be the foundation of IBRO (Marshall, 1996).

During his long life Beritashvili was the author of almost 400 research and review papers, many chapters in books, a dozen monographs, and the comprehensive three-volume handbook and the two-volume textbook that were re-published many times. He wrote his first book in 1916, at the age of 32, and his last, revised and expanded, was published in 1974, the year of his death when he was almost 90 years old. Shortly after his death, the first self-edited comprehensive book of Beritashvili's selected works was published in Moscow (Beritashvili, 1975), and the second enlarged selection, devoted to his centennial, was released in Tbilisi (Beritashvili, 1984).

Ivane Beritashvili died of acute pneumonia on December 29, 1974, two weeks before his 90th

birthday. He was buried in the square of Tbilisi State University, alongside the founder of the University, Ivane Javakhishvili.



Figure 6: I. Beritashvili, December 18, 1974, 12 days before his death. In his later years he proudly wore the embroidered black felt skull cap characteristic of the Kakhetian people of the east region of Georgia.

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