

The History of Neurology in St. Petersburg

A.A. SKOROMETTS¹ AND M.A. AKIMENKO²

¹St. Petersburg I.P. Pavlov State Medical University

²The St. Petersburg V.M. Bekhterev Psychoneurological Research Institute

This article expounds the history of the formation and development of neurology in St. Petersburg and emphasizes the original character of St. Petersburg school of neurology. The authors state that many prominent neurologists of St. Petersburg dedicated their work to the development of neurological concepts and have made an important contribution to different areas of neurology, including vascular and demyelinating diseases, diseases of the peripheral nervous system, neuroinfections, epilepsy, etc.

Keywords neurology, St. Petersburg, V.M. Bekhterev

One of the scientists recognized as the founder of neurology in Russia was an outstanding Russian scholar Vladimir Mikhailovich Bekhterev (1857–1927). In 1925, at the ceremony dedicated to the 40th anniversary of his professorship, one of his disciples, Professor M.I. Astvatsaturov noted: “Whereas neurology on the whole owes Bekhterev immensely important and substantial discoveries that further its development, Russian neurology in particular owes Vladimir Mikhailovich its existence.” (Astvatsaturov, 1926). At the beginning of the twentieth century, Bekhterev directed studies in the field of nervous and mental diseases at three St. Petersburg institutions at a time: the Imperial Military Medical Academy, the Women’s Medical Institute, and the Psychoneurological Institute. By the end of the 1920s there were already about 25 institutions and laboratories founded on the initiative and with direct assistance of Bekhterev (Table 1). He had trained about 5000 disciples, 16 of whom subsequently chaired departments of nervous and mental diseases at higher educational institutions in different parts of the then USSR. Owing to this fact, the relevant studies in St. Petersburg and a number of other regions of the country in the first quarter of the century were determined mainly by the investigations conducted by Bekhterev and his school, although another Russian school, the Moscow school of Professor A.Ya. Kozhevnikov (1838–1902) that also trained a lot of talented scientists, existed at that time (Anfimov, 1928).

Development of neurology at the Imperial Military Medical Academy

First of all it is necessary to dwell on the development of neurology at the Imperial Military Medical Academy (currently, S.M. Kirov Military Medical Academy). It is the oldest military academy and medical institute in Russia. Its history goes back to the eighteenth century, when the order was issued by Peter the Great to organize medical assistance for the soldiers (1715). After serial reforms, tsar Pavel I signed an edict in 1798, ordering the

Address correspondence to M.A. Akimenko, M.D., Ph.D., Associate Professor, The St. Petersburg V. M. Bekhterev Psychoneurological Research Institute, 3 Bekhterev Street, St. Petersburg, 192019, Russia. E-mail: sandro@AA8184.spb.edu

Table 1

List of Institutions Founded at the Initiative and with Direct Assistance of V.M. Bekhterev
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In Leningrad (currently St. Petersburg)

- 1893 – Neurological Department at the Clinic of Mental Diseases
 1894 – Physiological Laboratory
 1896 – Experimental-Psychological Laboratory
 1897 – Neurological Clinic and Medical Academy with a Neurosurgical Department
 1907 – Psychoneurological Institute as a scientific and academic institution
 1908 – General Training Courses
 1909 – Pedological Institute
 1910 – Reflexological Laboratory
 1910 – Institute for Alcoholism Studies
 1910 – Pedagogical Department
 1910 – *Medical Department*
 1913 – *Epilepsy Clinic*
 1914 – *Neurosurgical Institute*
 1915 – *Private University of Petrograd*
 1918 – *Pediatric Examination Institute*
 1918 – *Institute of Brain Study*
 1918 – *Institute for Study and Treatment of Morally Defective Children*
 1918 – *Central Institute for Study and Treatment of the Deaf-and-Dumb*
 1918 – *Veterinary Zoothechnical Institute*
 1918 – *Chemical Pharmaceutical Institute*
 1919 – *Subsidiary School for Defective Children*
 1919 – *Pathologo-Reflexological Institute*
 1920 – *Educational-Clinical Institute*
 1921 – *Pedagogical Institute of Social Education*
 1921 – *Nervous Clinic at State Institute of Medical Knowledge*
 1922 – *Society of Reflexology, Neurology, and Biophysics*
 1922 – *Psychoneurological Academy at the former Women's Medical Institute*
 1923 – Neurological Laboratory
 1923 – Reflexological Laboratory
 1925 – Commission for Sexual Education
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Note. Institutions whose names are typed in *Italics* were founded as a result of reorganization of the Psychoneurological Institute in 1918.

creation of Petersburg Medical-Surgical Academy (Figure 1). A six-bedded neurological unit was opened in 1881, and in 1897, a special clinic of nervous diseases was opened on the initiative of Bekhterev. It had a special operating room for "cerebral surgery" and was called the Department of Surgical Neuropathology. Interventions, which soon became routine, were performed by the leading surgeons of St. Petersburg, including N.A. Velyaminov, M.S. Subbotin, R.R. Vreden, and E.V. Pavlov. Bekhterev was the first physician in the history of medicine, who called for "making neuropathology a more surgical discipline" (1898). H. Cushing substantiated the necessity of "deeper immersion of surgeons into neurology" in 1905 (Fulton, 1946). It resulted in the appearance of a new specialty called surgical neuropathology or neurosurgery.



Figure 1. V. M. Bekhterev

After Bekhterev's retirement from the position of the department head in 1913, the department was reorganized into two independent ones: the department of neurology and the department of psychiatry. The position of the head of the department of neurology was given to one of his disciples, M. N. Zhukovsky (1868–1916), whose name received recognition in world neurological practice owing to his description of one of the most informative pathological foot reflexes.¹ In 1916 the position of the department head was taken by another disciple of Bekhterev, M.I. Astvatsurov, who spared no effort to develop his teacher's ideas of creating military neurology in Russia. At that time, subjects of study included war brain and spinal injuries, peripheral nerve injuries, neuroses, diagnosis and examination of epilepsy, etc.

In 1936 the position of the department head was taken by the neurologist-neurohistologist Professor B.S. Doinikov (1879–1948). During Doinikov's directorship two wars occurred — the Russian-Finn war (1939–1940) and the Great Patriotic War with Germany (1941–1945). Therefore, research work was focused mainly on the problems of treatment of peripheral nerve wounds and brain injuries. Military medical examination of the sequelae of craniocerebral injury was conducted according to the old medical aphorism “Nullum capitis vulnus leviter contemni debet” (No brain injury should be considered insignificant). These studies of war pathology laid the foundation of the two-volume *Experience of Soviet Medicine in the Great Patriotic War of 1941–1945*.

In 1948, Doinikov was succeeded by Professor S.I. Karchikian (1890–1965) who substantially contributed to the knowledge of injuries of the central and peripheral nervous system and to neuroses. At that time, most requested was the study of the impact of new weapons of mass destruction on the nervous system as well as the study of the epidemiology, clinic, diagnosis, and treatment of seasonal neuroinfections in the USSR, especially of tick-borne and Japanese encephalitis.

Under Professor A.G. Panov (1905–1978), who headed the department from 1962 to 1973, studies of neuroinfections and disorders of cerebral and spinal circulation of blood were broadened and intensified.

¹More information on the reflex is found in Wartenberg (1945).

Development of neurology at the State (Eleninsky) Clinical Institute

The department of nervous diseases at the Eleninsky² Clinical Institute (currently, the St. Petersburg Medical Academy of Postgraduate Education) was inaugurated on May 13, 1883. It was headed by O.O. Mochutkovsky (1843–1903), a well-known investigator of the clinic, etiology, epidemiology, and therapy of *tabes dorsalis*.³ In 1903 he was succeeded by L.V. Blumenau, (1862–1931), who headed the department until 1931. After graduating from the Medical Military Academy, Blumenau worked together with Professor I.P. Merzheevsky (1838–1908). Merzheevsky published his book on anatomy of the cerebral ventricular system in 1872, where he confirmed the existence of Magendie and Luschka's foramina and described areas of connection between the inferior horns of lateral ventricles and the subarachnoid space. He wrote *On the Importance of Application of Some Operations for the Treatment of Nervous and Psychic Diseases* (1886), in which he discussed the necessity of physiological substantiation of such interventions and advised surgeons and neuropathologists to consider indications very carefully. Blumenau found out that compression of the brain resulted in disorders of its blood circulation, manifesting as venous hyperemia and resulting in atrophy of nerve elements. He defended his thesis *On Studying an Effect of Pressure on the Brain* in 1889. Blumenau was sent abroad, where he worked with Flechsig and Charcot. He worked at the psychiatric department of the Warsaw military hospital. After coming back, he acquired the rank of a privatdocent (unestablished University lecturer) at the Chair of Nervous and Psychiatric Diseases of the Academy. In 1903, Blumenau became professor of the Clinic of Nervous Diseases at the State (former Eleninsky) Clinical Institute. The basic studies there included the anatomy and physiology of the brain, epidemic encephalitis, basilar artery thrombosis, combined lesion of posterior and left spinal trunks, Thomsen's myotonia, atrophic myotonia, acute disseminated sclerosis, and other issues of clinical neurology. The findings of the study of the anatomy and physiology of the brain were summarized in the monograph *Human brain* published as a manual and atlas in 1906, and reedited in 1925 (Kondakov, 2003).

In 1932 the subsequent head of the department was S.N. Davidenkov (1880–1961) (Figure 2). He is considered the founder of clinical neurogenetics in Russia. He was born the son of a schoolteacher in Riga (Latvia). After graduating from the Medical faculty of Moscow University in 1904, Davidenkov worked in Moscow, Kharkov (Ukraine), and Baku (Azerbaijan). In 1932 he moved to Leningrad (St. Petersburg) where he directed the department of neurology for almost 30 years (until 1961). His scientific interests were versatile; however, the genetic trend was prevalent in his investigations. He was the first in the USSR to organize medico-genetic consultations. He was also one of the first to indicate the genetic heterogeneity and polymorphisms of hereditary diseases and formulated a concept of the anticipation phenomenon. He described a new form of progressive scapuloperoneal muscular atrophy (Scapuloperoneal peripheral neuropathy - Davidenkov's Syndrome) — a rare form of hereditary progressive spinal muscular atrophy with system degeneration of the motor anterior horn cells, affecting both sexes and involving mainly

²Named after Elena Pawlowna (Frederika-Sharlotta-Maria) — great princess of Russia (1806–1873), daughter of Prince Paul-Karl of Würtemberg.

³He became well known in the west by Charcot's introduction of his suspension apparatus to stretch the spinal cord in patients suffering from neurological diseases (Goetz, Bonduelle, & Gelfand, 1995, p. 159). It was applied among others to the French writer Alphonse Daudet, who suffered from *tabes dorsalis*.



Figure 2. S.N. Davidenkov (1880–1961).

the scapular and peroneal muscles. He classified myopathies into seven different classes that were previously thought to be one disease. Written mainly during the siege of Leningrad (1941–1944), he published *Evolution-Genetic Problems in Neuropathology* in 1947. The book was published just before the devastating campaign on genetics and hence became a bibliographical rarity.

The importance of the 1948 session of the Lenin Pansoviet Academy of Agricultural Sciences in Moscow is widely known to historians of science (Belardelli, 1977). It was at this meeting that true genetics was denounced as reactionary “Mendelism-Morganism” (Golubovskii, 2000). Studies of genetics were resumed only in the 1960s. Only at the end of his life Davidenkov got an opportunity to organize the laboratory of medical genetics that after his death was headed by his wife and colleague Professor E. F. Davidenkova (1902–1996). The study of hereditary diseases of the nervous system initiated by Davidenkov in the 1930s became a determinant subject for the work of the department’s associates for many years on (Istoria nevrologii Sankt-Peterburga, 2004).

Development of neurology at the Women’s Medical Institute

Following the institutes mentioned above, the subsequent to be founded was the department of nervous and mental diseases at the Women’s Medical Institute (currently, St. Petersburg I.P. Pavlov State Medical University). It was established in 1900 under Bekhterev’s direction who headed it until 1913. When the department was divided into two independent departments — of psychiatry and of neurology — the latter became headed by Bekhterev’s disciple M.P. Nikitin (1879–1937) who retained his position until 1937. His scientific interests included clinical neurology and pathological anatomy of the nervous system, and he became well known for his research in the clinic and treatment of cerebral neoplasmas. Nikitin paid much attention to the development of neurology in Leningrad and promoted the foundation of the society of neuropathologists in this city in 1924.

In 1938 the position of head of the department was assumed by Professor E.L. Venderovich (1881–1954), whose name is associated with the development of a new research trend, i.e. the study of the morphology, physiology, and pathology of the conduction systems of the brain. He was succeeded in 1955 by D.K. Bogorodinsky (1898–1988), whose research efforts concentrated mainly on clinico-morphological and clinico-physiological trends. He paid attention to neurooncology, particularly to the clinical and

pathomorphological aspects of spinal tumors. He was the first in the world to single out a specific group of tumors he called “cranio-spinal tumors.” The results of these investigations were included in the fundamental manual on neurosurgery published by H. Cushing in the late 1930s. Of special importance are Bogorodinsky’s works dedicated to vascular cerebral and spinal pathology. He initiated studies of spinal blood circulation in the USSR and for over 30 years worked on this problem.

Development of neurology at the Psychoneurological Institute

In 1907, Bekhterev established the Psychoneurological Institute St. Petersburg (currently, the St. Petersburg V.M. Bekhterev Psychoneurological Research Institute), where a department of neuropathology was founded, which attracted outstanding Russian neuropathologists, including M.N. Zhukovsky, M.P. Nikitin, A.V. Gerver (1873–1939), V.M. Narbut (1871–1951), and Yu.K. Belitsky (1892–1951). The neurological studies at this institute were carried out in several directions. Surgery for nervous diseases was the first to evolve as a specific branch. The supervision of this area was entrusted to L.M. Pussep (1875–1942), an outstanding Russian neurosurgeon who initiated intensive research. He is considered the founder of the first department of neurosurgery in Russia and of the first neurosurgical institute of the country (1918). He is also recognized as a pioneer of neurosurgery in the world literature.

Pussep was born in Kiev. His father emigrated from Estonia and his mother had Polish and Czech roots. He studied in St. Petersburg and was Bekhterev’s disciple. He defended his medical doctoral dissertation on cerebral centers responsible for the regulation of sexual function in 1902. His opponent at the defense was the great Russian physiologist I.P. Pavlov (1849–1936), who was the head of the Physiologic Department of the Institute of Experimental Medicine since 1891. In 1902, Pussep was appointed head of the Department of Surgical Neuropathology in the Clinic of Nervous Diseases, where operations for epilepsy, hydrocephalus, birth trauma, tumors of the brain and spinal cord, and injuries of the peripheral nervous system were performed. He presented his report *On Indications and Contraindications for Trephination of the Skull in Epilepsy and Idiocy* at the ninth Pirogov’s Congress, held in 1904. Pussep was given the rank of a privatdocent of Mental and Nervous Diseases (at the Medical military Academy) in 1907. In the same year he appealed to the Academy Conference for permission to read lectures on surgical neuropathology and published his *Foundations of Learning on Brain Functions*, consisting of seven volumes. He was allowed to set up a new educational establishment, named the Psychoneurological Institute, in 1907. Pussep took part in drawing up the first Regulations of this Institute. He became professor and director of a neuropathologic surgical clinic of the above Institute in 1910. “...A neuropathologic surgical clinic, attached to the Institute, has been opened on September 1, 1910; it occupies a reconstructed building of the Matveevskaya Hospital and is situated in 41, Bolshoi Prospect of the Petrogradskaya storona (district⁴). The mentioned clinic has 32 beds for patients — 6 in separate and 26 in general wards...” (Kondakov, 2003).

The first elective course organized for students of the Academy at the initiative by Bekhterev and Pussep in 1909–1910 was “Surgical Treatment of Nervous and Mental Diseases” (Figure 3). A medical faculty was opened at the Psychoneurological Institute in 1911. Pussep began to lecture on surgical treatment of nervous diseases at the newly

⁴Translator’s note.



Figure 3. V.M. Bekhterev and L.M. Pussep among employees and patients of the Pirogov Neurosurgical Hospital.

created Chair of Surgical Neuropathology. The Clinic of Neurosurgery was transformed into the Petrogradsky Military Infirmary, named after the well-known Russian surgeon N.I. Pirogov (1810–1881), in 1915. It was the first local medical establishment for the wounded with injuries of the nervous system.

In 1917 Pussep published the first volume of a manual on surgical neuropathology, entitled *Surgery of the Peripheral Nervous System*. A series of reports, published by Pussep in 1915–1918, formed the principles of modern military neurosurgery. Among them one can mention *A Report on the Infirmary Activity; Surgical Treatment of Traumatic Lesions of the Nervous System; Traumatic Neurosis of Wartime, etc.*

According to Order N 2327 of March 1, 1918, the Executive Committee of the Petrosoyuz (union*) of Disabled Military Men and its Medical-Technical Department set up a neurosurgical Institute. The Neurosurgical Clinic (the Pirogov Infirmary) of the Psychoneurological Institute was used as its base. The institute had 150 beds and 3 departments: neurosurgical (50 beds), paralytic (70 beds), and epileptic (30 beds). At the beginning of 1920 considerable numbers of operations on patients with cerebral tumours (500), epilepsy (327), peripheral nerves injuries (275), and gunshot wounds of the spine and spinal cord (45) were done (Kondakov, 2003).

Reorganization of higher education in 1919 led to the appearance of the State Institute of Medical Knowledge (the former medical faculty of the Psychoneurologic Institute). Pussep was appointed its director. Besides, he was professor of the Chair and superintendant of the Clinic of Surgical Neuropathology of the same institute. In 1920 Pussep left Russia and became head of the department of neurology and neurosurgery of Tartu University (Estonia).

An invaluable contribution to the study of vascular cerebral pathology was made by a renowned Russian neuropathologist Professor L.Ya. Pines (1895–1951). A graduate of Zurich University, who once worked under the supervision of V. Magnan and, later on, of Bekhterev, he introduced in Russia a clinico-morphological method into research.

It was under his supervision that the features of blood supply in the region of anterior, middle, and posterior cerebral arteries were studied. These investigations were continued by V.I. Frenkel who paid special attention to the study of the blood supply of the brainstem and singled out a number of syndromes, formerly not mentioned in the literature. G.Z. Levin (1905–1990) gave special consideration to the study of stroke in the acute

phase. He was the author of a successfully implemented idea to create specialized emergency teams and specialized units at Leningrad hospitals for the treatment of patients with acute stroke, which considerably decreased the mortality in this type of pathology in the 1960s–1970s. Owing to the fact that in the 1960s the institute began to develop actively the concept of rehabilitation of the patients, a special department of rehabilitation of neurological patients was founded at the institute in 1969 under the direction of Professor T.D. Demidenko (b. 1920).

Epilepsy studies were directly associated with the name of Bekhterev. He did not only solve significant anatomic-physiological, clinical, and therapeutic problems but also paid attention to its organizational aspects, which were of great importance for the country. For instance, in 1910, at the third Congress of Psychiatrists, the Russian branch of the “League against epilepsy” was founded under the aegis of the Psychoneurological Institute, and the first clinic for research on epilepsy in Russia was created. In the 1930s–1940s, epilepsy investigations were carried out under the supervision of Davidenkov, who studied the heterozygous epileptoid structure and differential diagnostics of idiopathic epilepsy and symptomatic epilepsy and by Professor A.Ya. Ratner (1893–1944), who regarded the problem from an endocrine-vegetative point of view. In the 1950s, research was directed by Professor S.P. Vorobyov (1904–1972) who paid special attention to metabolic processes in epilepsy and, from 1973, by Professor S.A. Gromov (b. 1929) who developed the issue of the epidemiology and restorative treatment of patients with epilepsy (in cooperation with M.A. Akimenko) and, in the last few years, the issues of preclinical epileptogenesis.

The institute’s research in the field of neuroses not only determined the essence of the development of this area of neuropsychology in the country but also changed its entire approach. This became possible owing to the efforts of two researchers who headed the team of psychologists of the institute after V.M. Bekhterev’s death: Professor V.N. Myasishchev (1893–1973) and Professor B.D. Karvasarsky (b.1931). Myasishchev formulated 1) a genetic theory of neuroses based on a synthesis of a natural-scientific and social-historic understanding of personality in the pathogenesis of disease states and 2) a theory of psychology of relationships (Myasishchev, 1960). Karvasarsky created a leading school of psychotherapists and developed a new therapeutic system of neuroses that was named “personality-oriented (reconstructive) psychotherapy” (Karvasarsky, 1999).

Thus, the institute’s research of vascular cerebral pathology, epileptology, and psychology has won both national and international recognition (Akimenko & Shereshevski, 2002).

Development of neurology at the I.I. Mechnikov State Medical Academy

Proceeding to the history of research in neurology at the St. Petersburg, I.I. Mechnikov State Medical Academy,⁵ we think it is necessary to point out a fact of great significance, which has for a long time determined the essence of studies carried out at this institution. The point is that the above mentioned V.M. Bekhterev Institute was, up to 1919, not only a scientific and practical facility but also a higher educational institution with a medical department. After the revolution of 1917, the system of higher school in Petrograd (currently, St. Petersburg) was reorganized in 1919, and, as a result, this medical department

⁵Mechnikov I.I. (1845–1916) Russian microbiologist best remembered for his pioneering research into the immune system. 1908 Nobel Prize Laureate in Physiology and Medicine.

was transformed into the State Institute of Medical Knowledge (SIMK), which subsequently, after a number of other transformations in the twentieth century, got the status of a medical academy. The positions of the rector of the SIMK and of the head of its department of nervous diseases were taken by one of Bekhterev's disciples, Scientific Secretary of the Psychoneurological Institute, Professor A.V. Gerver (1875–1939) who was succeeded by Professor L.Ya. Pines in 1939.

The field of Gerver's research included the study of the histological structure, function, and clinic of the basal ganglia and quadrigeminal plate. These investigations have been recognized as classical. Gerver's fundamental work was the monograph *The Structure and Functions of the Nervous System*. Pines remained head of the department only for two years and was succeeded by the outstanding Russian neuropathologist I.Ya. Razdolsky (1890–1962), who focused his attention on the studies of tumors of the central nervous system. He published over 160 scientific works, including five monographs. During the 900-day siege of Leningrad during World War II, Razdolsky described the clinic that was observed in the survivors: arterial hypertension in combination with the neurological symptoms as the result of starvation (so-called "siege syndrome").

From 1963 to 1991 the position of the department head was held by Professor P.G. Lekar (1922–1998). In those years, his team was developing two basic research areas: hepatocerebral diseases and pathology of the vegetative nervous system. During the 80 years of existence of the department in the twentieth century its associates made an important contribution to research in neurooncology, hepatocerebral diseases, and pathology of the vegetative nervous system.

Development of neurology at the Pediatric Medical Academy

The progress in the development of child neurology needs to be mentioned. An essential contribution to this area has been made by the researchers of the department of nervous diseases and neurosurgery at the St. Petersburg Pediatric Medical Academy. The first unit for children with nervous diseases was established in Leningrad in 1929 at the Research Institute of Maternity and Infancy Care. It was on the basis of this unit that the department of nervous diseases and neurosurgery for children was founded in 1932. It was headed by Professor M.I. Jogiches (1864–1936). At that time, the research team was developing the methods of prevention and treatment of diseases of the nervous system in children, including different forms of epilepsy, encephalitis, myopathy, postanoxic encephalopathy in newborns, etc. In 1955 the position of the department head was taken by Davidenkova, whom we mentioned above. She reoriented the work of the department towards the study of chromosomal diseases of man: Down's syndrome, Shereshevsky-Turner syndrome, Klinefelter's syndrome, XYY, epilepsy, etc. In 1972 Davidenkova was succeeded by Professor A.M. Korovin (b. 1925) under whose direction the clinico-genetic investigations were supplemented with the studies of paroxysmal disorders of consciousness.

Development of neurology at the Institute of Child Infections

One more institute of pediatric orientation was founded in Leningrad (1927). It is now named "the Institute of Child Infections". At this institute, A.S. Griboedov (1875–1944), one of Bekhterev's disciples, created a psychoneurological department where the principal areas of research were epilepsy and neuroses. In 1936, the study on infections of the nervous system began under the aegis of Professor N.A. Kryshova (1895–1972). It

included studies of chorea, tuberculous meningitis, and poliomyelitis. The originality of the Institute of Child Infections consists in its mobile opportunities to reorient its scientific work in accordance with the epidemiological situation in the country and city.

Discussion and conclusion

The following factors played an important role in the successful and many-sided development of neurology in St. Petersburg (Leningrad) in the twentieth century: 1) At the beginning of the twentieth century St. Petersburg was the capital of Russia, which furthered the establishment and successful functioning of four large-scale scientific neurological centers (the Imperial Military Medical Academy, the Eleninsky Institute, the Women's Medical Institute, and the specialized Psychoneurological Institute); 2) For a great deal the investigations were supervised by the outstanding neurologist Bekhterev; 3) During the Soviet period, a number of new higher educational and research institutions with departments of nervous diseases were founded; and 4) The successful and fruitful work of a great number of remarkable researchers and physicians enabled the foundation of the St. Petersburg school of neurology characteristic for its anatomo-physiological and psycho-social approaches to the study and interpretation of the clinical manifestations of diseases of the nervous system.

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