

## The 100th Anniversary of the Russian Pavlov Physiological Society

The first All-Russian Congress of Physiologists was held in Petrograd (Saint Petersburg), Russia in April 1917 at the Medical Institute for Women (11). Ivan Pavlov was the chairman of the organizing committee for this first “Sechenov Physiological Congress,” but he was unable to attend because of a fractured hip sustained in a fall on December 27, 1916 (7). Nevertheless, Pavlov wrote an address, which was read at the opening of the Congress on April 6, 1917. This was a peculiar address because Pavlov had been denied permission by the Tsar to hold such a conference, which he feared might have political overtones. But, by the time the conference began, the Tsar, Nicolas II, had abdicated (on February 27, 2017), and a provisional government was in place. Pavlov thus acknowledged the new regime in his address and hoped that it would be sympathetic to the sciences. He also announced the start of a new journal, and his address was published in that journal (the *Russian Physiological Journal*, vol. 1, nos. 1–2, 1917; also published in Ref. 7).

### **Pavlov's Address to the First All-Russian Congress of Physiologists**

Pavlov's opening address at the 1917 meeting was read by V. I. Vartanov, who, along with Pavlov and A. A. Likhachev, had worked for 6 years to obtain permission to form the Russian Physiological Society and to convene a meeting. In this address, Pavlov stated his hopes for the new journal of Russian physiology and for the success of the new government and its support of science and scientists. From Koshtoyants, 1955, p. 49–50 (7), Pavlov wrote to the first congress:

*Dear Comrades,*

*I deeply regret that I am unable to be with you. We are living in really extraordinary times. Hitherto dispersed and separated, we are coming together now and forming a society that will have common interests and a common aim—to maintain Russian physiology at the highest possible level. And our prime concern at the moment is our journal. One can say that in the permanent international exhibition of physiology we shall, at last, have our own pavilion! Each of us must do his best to make it as rich and as interesting as possible; it will give foreigners a better idea of our activity, better than they had when we were dispersed; it will enable them to appraise us. The circumstances favour the appearance of our journal. Our new intercourse in the form of regular papers from all parts of our motherland, exchange of views, demonstration of experiments and apparatus, and even, so to speak, entire physiological establishments—our laboratories—as well as the mutual encouragement and mutual assistance they entail—all this cannot but intensify our usual work. The present extraordinary situation in Russia is bound to add in a big way to our own particular upsurge. We have just parted with the sombre epoch of oppression. It suffices to remind you that this congress was not permitted to be held over Christmas, permission was granted for it to be held at Easter only after the members of the organizing committee had signed a statement saying that no political resolutions would be pre-*

*sented at the congress. But that was not all. Two or three days before our Revolution, final permission was obtained on the condition that the theses of the papers be submitted beforehand to the city head.*

*But thank God, this is already a thing of the past and, let us hope, the irrevocable past.*

*A grievous sin was committed by the Great French revolution when it executed Lavoisier and when his appeal for a postponement that would enable him to complete important chemical experiments was answered by the statement that “the republic needs neither scientists nor their experiments.” But in this respect, too, the past century has seen a real revolution in the human mind; now we need not have any fears about a democracy disregarding the eternally majestic role of science in human life.*

*We cannot but anticipate, and with the new system of our life, we must anticipate an exceptional growth of the means for all kinds of scientific activity. And this being so, it should be an added incentive for us to step up our effort to the utmost. How timely, then, in our free motherland, now being renovated and endeavoring to create the best possible conditions in all spheres of life, are the society and its journal, so happily linked with the glorious name of Ivan Mikhailovich Sechenov, the founder of Russian physiology and the embodiment of a genuinely free spirit!*

*Hearty greetings, comrades, and best wishes for a good beginning to our undertaking!*

The difficulties that had to be overcome to obtain permission to hold the first Russian Congress of Physiology, which occurred between the revolutions of February and October 1917, and the

difficulties and delays in holding the second congress in 1926, are described by Ostrovsky (11). The *Russian Journal of Physiology* was founded at this 1917 congress and continues today as the *Sechenov Russian Journal of Physiology*.

### History of the Society

Ostrovsky (11) has given a history of the Russian Physiological Society, which was known as the Sechenov Physiological Society from 1917 until 1930, when it was renamed the All-Union Society of Physiologists, Biochemists and Pharmacologists. In 1960, the name was changed to the Pavlov Physiological Society, by which it is known today. Pavlov was the first president of the society (1917–1936), followed by his student L. A. Orbeli (1937–1950 and 1956–1958); O. G. Gazonko (1983–2004); Yu. V. Natchin (2004–2007); and M. A. Ostrovsky (2007–present). In September 2017, the Society will have its 23rd meeting in Voronezh, Russia.

### The 100th Anniversary Meeting

A meeting to celebrate the 100th Anniversary of the Russian Pavlov Physiological Society was held in Saint Petersburg, Russia from April 17 to 19, 2017, exactly 100 years after the first meeting, which Pavlov and his colleagues worked so hard to prepare. The Organizing Committee was chaired by Ludmila P. Filaretova, a corresponding member of the Russian Academy of Sciences (RAS), and included academician M. A. Ostrovsky, the president of the society; Dr. L. Lorusso, the chairman of the FENS History committee; academician Yu. V. Natchin; academician A. D. Nozdachev; and corresponding member of the RAS, P. M. Balaban. The first day of the meeting was held at the Maxim Gorky House of Scientists of the RAS (Saint-Petersburg, 26 Dvortsovaya Nab.), and the next 2 days at the Pavlov Institute of Physiology of the RAS (St. Petersburg, 6 Makarova Nab.).

Highlights of the meeting included the following greeting from the International Union of Physiological Societies (IUPS) President Denis Noble: “On behalf of the International Union of Physiological Sciences, I send heartiest congratulations to the Russian Pavlov Physiological Society on the occasion of its Centenary Meeting in St. Petersburg. IUPS was proud to be

hosted by your Society for the 1997 World Congress, also held in St. Petersburg. We look forward to many more years of collaboration between IUPS and the Russian Pavlov Physiological Society.”

Opening remarks were provided by Mikhail Ostrovsky, President of the Russian Pavlov Physiological Society (11), which was followed by a presentation by Lorenzo Lorusso, Head of the History Committee of the Federation of European Neuroscience Societies (FENS) on “The Importance of Physiology for Medicine” (13, 15). Zoltán Molnár (Department of Physiology, Anatomy and Genetics, University of Oxford) presented a paper on “The Dawn of Modern Neuroscience: Pavlov and Sherrington” (9); and B. Lichterman (Sechenov First Moscow State Medical University) spoke on “Neurosurgery as Applied Neurophysiology” (8). Later, Willem Hendrik Gispen (Descartes Centre for the History and Philosophy of the Sciences and the Humanities, Utrecht University) gave a presentation on “The Roots of Neuroscience” (<http://why-the-brain-matters.joburg/prof-willem-hendrik-gispen/>), and A. Nozdachev (Chairman of St. Petersburg Sechenov Society of Physiologists, Biochemists and Pharmacologists) gave a presentation on the history of the “House of Scientists as a First Club of Scientific Intelligentsia” (10).

The second day of the meeting opened with a lecture by Ludmila Filaretova, Director of Pavlov Institute of Physiology, on “The Development of Scientific Heritage of Ivan Pavlov at Pavlov Institute of Physiology RAS” (4) ([http://infran.ru/history\\_eng.htm](http://infran.ru/history_eng.htm)). This was followed by a talk by Richard E. Brown (Department of Psychology and Neuroscience, Dalhousie University) on “Pavlov in America: The Influence of Pavlov on Lashley and Hebb” (1). Marco Piccolino (University of Ferrara, Italy) then gave a presentation on “A. L. Bykov and the Russian Contribution to Vision Research” (12). Later in the day, there were presentations by Y. Shelepin (Pavlov Institute of Physiology RAS) on “Neurophysiology of Vision and Neurotechnologies of Purposeful Behavior” (5); S. Medvedev (Bekhtereva Institute of Human Brain RAS) on “Pilgrimage of the Light Spot. Brain Basis of the Highest Functions” (6); and T. Chernigovskaya (St. Petersburg State University) on “Brain

and Mind: From Behavioral Physiology to Neurocognitive Technology” (2). These afternoon presentations were followed by a short film on “Pavlovian Koltushi,” which showed 1934 footage of Pavlov’s laboratory and the development of the village of Koltushi as a research center (<https://www.net-film.us/film-31036/>). The third day of the meeting consisted of 31 presentations and 37 posters by Russian physiologists, which are available on the meeting website (<http://www.infran.ru/meetings.htm>).

**Maxim Gorky House of Scientists.** The Maxim Gorky House of Scientists is the former Palace of Grand Duke Vladimir Alexandrovich, one of the last Imperial palaces built in St. Petersburg in 1872. After the October 1917 Revolution, the Vladimir Palace was presented as the Maxim Gorky House of Scientists, a social and cultural club for the scientific intelligentsia. During the great depression of 1919–1920, Gorky dispensed food, clothing, and other essentials of survival to scientists and their families from this house (14). As a result, it has the most authentic and best preserved interiors of any of St. Petersburg’s royal residences.

**History of the Pavlov Institute of Physiology.** The Pavlov Institute of Physiology of the Russian Academy of Sciences (FIGURE 1) began as the Physiological Institute of the USSR Academy of Sciences, which was founded in 1925. Pavlov was the first director of this institute, whose main goal was to study the physiology of the brain hemispheres by the method of conditional reflexes. By the early 1930s, the problems investigated at the institute included the activity of brain hemispheres, interactions of excitation and inhibition processes, experimental neuroses, as well as the higher nervous activity of primates. In 1934, new Departments of Anatomy, Biochemistry, Biophysics, and Experimental Psychology were founded, and studies on the structural and physico-chemical basis of physiology and psychology of the animal and human brain were conducted ([http://infran.ru/history\\_eng.htm](http://infran.ru/history_eng.htm)).

After Pavlov’s death in 1936, the Physiological Institute was named after him and headed by Academician Leon A. Orbeli, who added evolutionary, comparative, and aging physiology; the physiology

of the autonomic nervous system and sense organs, as well as studies on cell biochemistry and cell biophysics. By the late 1940s, the institute was a center for evolutionary physiology, sensory systems physiology, and animal husbandry physiology. In 1950, the Pavlov Physiological Institute of the USSR Academy of Sciences merged with the Pavlov Institute of Evolutionary Physiology and Pathology of the Higher Nervous Activity of the USSR Academy of Medical Sciences and with the Institute of the Central Nervous System of the USSR Academy of Medical Sciences. This new Pavlov Institute of Physiology of the USSR Academy of Sciences was headed by academician Konstantin M. Bykov and became a center for investigations on physiology and pathology of the higher nervous activity, general physiology of the nervous system, physiology of sense organs, and evolutionary and ecological physiology. Studies on the physiology and pathology of cortico-visceral interrelations played an important role in the development of the modern concept of psychosomatic diseases.

From 1959 to 1977, the Institute was headed by academician Vladimir N. Chernigovsky and concentrated on research in the neurophysiology of higher nervous activity; the physiology of sensory systems and speech; and the physi-

ology of visceral systems. Academician Alexander M. Ugolev discovered membrane digestion, a universal mechanism of food digestion. From 1977 to 1981, the acting director of the institute was Professor Kirill P. Ivanov, who organized the Inter-Institute Biological Computer Center, the Mathematical Data Processing Group, and the Group of Research Automation. From 1981 to 1994, the institute was headed by academician Vladimir A. Govyrin and focused on the molecular, cellular, genetic, and systemic mechanisms of adaptive behavior; the principles of perception and processing of information by sense organs; and the structural-functional organization of central control mechanisms of the visceral organs. From 1994 to 2015, the director of the institute was corresponding member of the RAS, Djun. P. Dvoretzky, who organized further development of the investigations of peripheral and central mechanisms of regulation of circulation, vascular tone, and respiration. New neurophysiological mechanisms of spinal locomotion and the role of genes controlling the nervous system, and adaptation and learning processes were investigated. Since 2015, the institute has been headed by corresponding member of the RAS, Ludmila P. Filaretova. At present, the Pavlov Institute of Physiology is

the largest physiological institute in Russia where all fields of physiology are presented (<http://www.infran.ru>).

In 1913, Pavlov wrote the reference for Sherrington's application for the Waynflete Chair of Physiology, University of Oxford. Zoltán Molnár presented a scanned copy of this letter to the Pavlov Museum (the original is in Vancouver, Canada; <https://cslide.medsci.ox.ac.uk/items/view/2959>). The translated letter, which was originally in German, reads as follows:

*I have the high honor to attest, that according to my opinion, Professor Charles S. Sherrington stands in the very first row of contemporary workers in physiology. His works on the central nervous system and especially the spinal cord must be recognized as classical pieces of work. He collected such a large sum of facts, and constructed such a substantial quantity of general theses about the function of the central nervous system, that with all justification one can consider him to be the main founder of that part of physiology, which one could call "mechanics of the central nervous system." The leading experiments of Sherrington, which are still continued by his coworkers and successors, led always to further, highly important results.*



**FIGURE 1.** Pavlov Institute of Physiology of the Russian Academy of Science in Saint Petersburg

**I. P. Pavlov Museum in Koltushi.** Pavlov had a summer house in the village of Koltushi, ~10 km from Petrograd, and in 1926, he founded a Biological Research Station here. Later, it was expanded to a research campus with a number of laboratories in which investigations of physiology of the higher nervous activity were carried out (FIGURE 2). The physiological research center in Koltushi was built in the early 1930s. When Pavlov was still alive, Koltushi was visited by many prominent world leaders in science and culture, including A. V. Hill, L. E. Lapicque, J. Barcroft, W. B. Cannon, H. Hunt, Herbert G. Wells, and Niels H. D. Bohr. During these years, Koltushi was recognized as “the capital of conditional reflexes” (3). At present, Pavlov’s Koltushi, which includes Pavlov’s laboratory building, Pavlov’s monument, the avenue with scientists’ busts, and the cottages is a World Heritage site. In 1993, to further develop the scientific heritage of Ivan Pavlov, and to increase international scientific cooperation, the I. P. Pavlov International Research Center was founded in the institute in Koltushi.

One of the first buildings in Koltushi, built in 1933, was the Laboratory of Genetics of the Higher Nervous Activity, on which Pavlov had inscribed the words “Experimental genetics of the higher

nervous activity,” and on the tower he had inscribed, “Observation and observation.” In front of the laboratory, there are busts of R. Descartes, G. Mendel, and I. M. Sechenov, as well as a bust of I. P. Pavlov himself and a bust of Charles Darwin. Inside the laboratory, the first floor was occupied by a surgery room, library, room for technicians, and other rooms. On the second floor were living rooms for biostation researchers and a small apartment for Pavlov that consisted of the sitting room, bedroom, children’s room, and a study with a sunroom verandah. In the hallway are photographs of Pavlov, his family, and his colleagues taken in various years (FIGURE 3). Some represent his everyday research and leisure activities, others show him together with his colleagues and with visitors, including the English writer Herbert G. Wells and the Danish physicist Niels Bohr on their visits to Koltushi. There is also a diorama of Koltushi between 1925 and 1933, and a room with a soundproof chamber for use in studies of conditional reflexes.

### ***Pavlov Institute for Experimental Medicine***

On Thursday, April 20, one of us (R. E. Brown) visited Dr. Victor Klimenko at the Pavlov Institute of Experimental Medicine and had a tour of Pavlov’s office

museum and the famous “Tower of Silence.” Pavlov’s office museum contains his desk and pen, his tin of tea and his sugar cubes, as well as his death mask, and an organ dated 1908. The organ was not for musical interludes but for producing exact auditory stimuli used for discrimination learning in the dogs. Pavlov’s “Kamera 7” is an intact room used for conditioned reflexes, and the special aseptic surgical suite designed by Pavlov for surgical procedures on his dogs is still in use (13). In the garden, there is a “dog fountain” surmounted by a statue of a dog and surrounded by carvings of Pavlov in the laboratory and inscribed with passages from his notebooks.

### ***Saint Petersburg State University and Pavlov Apartment Museum***

During the meeting, we were taken on a brief tour of the Twelve Colleges building (built in 1742) of Saint Petersburg State University by Professor Alexander G. Markov and academician Alexander D. Nozdrachev. We saw the apartment museum of Mendeleev, where he developed the Periodic Table of the Elements, the university museum, and the classroom where Pavlov studied physiology as a student. Possibly the highlight of the trip was a visit to Pavlov’s apartment museum at Number 2, 7th Line, Vasilyevsky Island,



**FIGURE 2.** I. P. Pavlov Museum in Koltushi

where we were given a guided tour, a booklet, and a tea, served in Pavlov's dining room. This apartment was Pavlov's home for 18 years and was kept unaltered for 30 years by Pavlov's wife before becoming a museum. ([http://infran.ru/history\\_eng.htm](http://infran.ru/history_eng.htm)). The apartment museum was opened in 1949, on the 100th anniversary of Pavlov's birth, and is in the possession of the I. P. Pavlov Institute of Physiology. The furniture and decorations are authentic and were preserved as they were during Pavlov's life. The apartment consists of a living room, study/bedroom, kitchen, dining room, and second bedroom. Pavlov's study and bedroom consisted of one large room, divided by bookcases. The center of the study contains the writing table at which Pavlov worked in the evenings. Portraits, paintings, photographs, and memorabilia collected by Pavlov decorate the rooms. The bookshelves contain Pavlov's books published during his life, books on philosophy, political

economy, history, biology, physiology, and medicine; as well as books of Pavlov's favorite Russian and foreign authors. Standing on one of the bookcases is a small white toy dog, a gift to Pavlov by Cambridge University students when he was awarded an honorary doctorate by Cambridge University in 1912.

### Summary

The existence of the Russian Physiology Society is a credit to the perseverance of Pavlov and his colleagues in the years leading up to the year 1917, and their ability to survive the 1917 revolutions and flourish in the last 100 years. The presentations at this meeting showed the breadth and depth of physiology research in Russia, and the 23rd meeting of the Pavlov Society of Russian Physiology in the city of Voronezh, Russia in September 2017 will no doubt be a great success. One of the problems is that for Russian physiology to have the international impact that it deserves, the publications must be translated into English or

other European languages to be accessible to interested researchers. As a matter of fact, starting from the 1950s, there has been in Russian science, and particularly in physiology and biochemistry, a trend to publish in English among many leading scientists of the former USSR, especially evident with the creation of the journal *Byophysys*, the English version of the Russian journal *Biofizika*. These trends should possibly be revived in contemporary Russian science. The Pavlov museums are exceptional, and we were privileged to visit them, but these are in need of funding to maintain them, and the members of the Institute of Physiology are working to obtain funds for this important task. It was an honor and a privilege for us to participate in this centenary meeting, and we are deeply grateful to our Russian hosts for their warm friendship, the perfect organization of the event in scientific, cultural, and social dimensions. We hope that this could be the start of a more intense phase of mutual knowledge and collaboration



**FIGURE 3.** Room verandah of Pavlov at I. P. Pavlov Museum in Koltushi with a replica of his portrait by painter M. V. Nesterov (with permission from I. P. Pavlov Museum)

between persons and institutions from Russia and other countries in the spirit of international comprehension that should be a landmark of the genuine scientific endeavor. Photographs from the meeting are available on the websites listed in the Acknowledgments. ■

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