

Conjoined twins: scientific cinema and Pavlovian physiology

Nikolai Kremmentsov

Institute for the History and Philosophy of Science and Technology, Victoria College, University of Toronto, 91 Charles Street West, Toronto, Ontario, Canada M5S 1K7

Through the lens of a 1957 documentary film, “Neural and humoral factors in the regulation of bodily functions (research on conjoined twins),” produced by the USSR Academy of Medical Sciences, this essay traces the entwined histories of Soviet physiology, studies of conjoined twins and scientific cinema. It examines the role of Ivan Pavlov and his students, including Leonid Voskresenkii, Dmitrii Fursikov and Petr Anokhin, in the development of “scientific film” as a particular cinematographic genre in Soviet Russia and explores numerous puzzles hidden behind the film’s striking visuals.

In the last few years, as part of a concerted effort to bring to light numerous “hidden treasures” kept in its vast storages,¹ the US National Library of Medicine (NLM) initiated a program of digitizing moving images pertaining to the history of medicine and public health. The NLM audiovisual collection includes nearly 7000 titles from the Silent Era to the present, covering a broad range of topics from surgery to tropical medicine and from mental health to personal hygiene. Many of these films are quite rare and in certain cases the Library may have the only surviving copy. So far, nearly 200 motion pictures, cartoons and documentaries have been made freely accessible on the Library website, with many more planned to appear on line in the coming years.² In the summer of 2013, the NLM also launched a special project titled “Medical Movies on the Web” – a separate portal to selected films from its digital collection curated by a team of well-known historians of medicine, David Cantor, Michael Sappol and Paul Theerman.³ The project intends to highlight certain films by supplementing the visuals with searchable transcripts of their contents, along with expert commentary that sets the films in historical contexts,

a bibliography of relevant publications and a variety of related materials from the collections of the Library and other repositories.

Among various motion pictures selected to appear on the “Medical Movies on the Web” portal is a 40 min long documentary film titled “Nervous and Humoral Factors in the Regulation of Bodily Functions (Research on Conjoined Twins)” produced in 1957 by the USSR Academy of Medical Sciences. This film offers a fascinating glimpse of the history of both Soviet physiology and Soviet “scientific cinema,” even though it was never intended to reach beyond a very narrow specialist audience. To an attentive viewer, it presents numerous puzzles, beginning with its very presence in the NLM collections: the Library has no records of its provenance. The film’s production stretched across some twenty years, from the times of Joseph Stalin’s “Great Terror” to Nikita Khrushchev’s de-Stalinization campaign known as the “Thaw.” Its first frames were shot in 1937 with the birth of the first pair of the conjoined twins Ira and Galia and the last ones in 1957, depicting the seventh birthday of the second pair Masha and Dasha. In a sense, this film is the only available substantial record of the research conducted on these two pairs, for no sizeable scholarly publications documenting and analyzing its results ever appeared. Although the conjoined twins with a common blood circulation, but separate nervous systems presented a unique opportunity for studying a variety of extremely interesting questions, not only in physiology, but also psychology, genetics, immunology and embryology, the film focuses exclusively on the relative role of “neural and humoral factors in the regulation of bodily functions.” Indeed, the entire movie is nothing more than a cinematographic illustration to the views on this subject by Ivan Pavlov (1849–1936), Russia’s first Nobelist and the doyen of Soviet physiology.⁴ Following the long-standing Russian tradition of “nervism,” Pavlov always emphasized the dominant role of the nervous system in the organism’s physiology and behavior and largely ignored the role of humoral factors, which nearly cost him his Nobel Prize.⁵ Yet, despite the fact that the film is thoroughly imbued with the Pavlovian lingo, inexplicably, Pavlov himself is

Corresponding author: Kremmentsov, N. (n.kremmentsov@utoronto.ca).

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¹ See Michael Sappol, ed., *Hidden Treasure. National Library of Medicine (U.S.)*. New York, N.Y.: Blast Books, 2012. An e-version of the book is free for perusal and download at http://collections.nlm.nih.gov/ext/pub/HIDDEN_TREASURE_NLM_BlastBooks.pdf.

² See [http://collections.nlm.nih.gov/?fdrep2.format\[\]\]=Moving+image](http://collections.nlm.nih.gov/?fdrep2.format[]]=Moving+image).

³ See <http://www.nlm.nih.gov/hmd/collections/films/medicalmoviesontheweb/>. The 1957 film is now accessible at <https://www.nlm.nih.gov/hmd/collections/films/medicalmoviesontheweb/conjoinedtwins.html>.

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⁴ For a monumental biography of Pavlov, see Daniel P. Todes, *Ivan Pavlov. A Russian Life in Science*. New York: Oxford University Press, 2014.

⁵ For a detailed discussion of Pavlov’s nervism, see Daniel P. Todes, *Pavlov’s Physiology Factory*. Baltimore: Johns Hopkins University Press, 2002; on the Nobel Prize, see pp. 322–346.

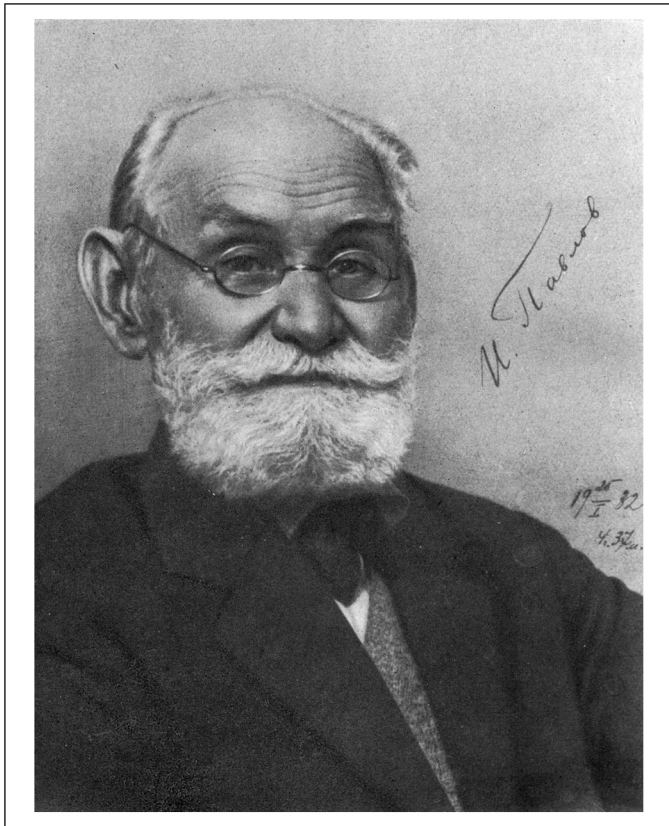


Figure 1. Ivan Pavlov's portrait of 1932 published in Anokhin's biography of his teacher and mentor. From Anokhin (1949).

completely absent from the film. No iconic portraits that graced every Soviet physiology textbook appear anywhere, nor his name is mentioned even once in the film's running commentary (see Figure 1). This absence is even more puzzling given that the film's "research director" (as he is identified in the credits) Petr Anokhin (1898–1974) was one of Pavlov's students and protégés from the early 1920s on.⁶ Anokhin has actively contributed to the construction of Pavlov's mythic image as a quintessentially "Soviet" scientist in numerous articles and a 400-page-long biography of his former teacher and patron.⁷ Why would he miss the opportunity to publicly emphasize (once again) his personal connections to the "founding father" of Soviet physiology? Anokhin makes only a cameo appearance in the film's last few frames, but his twenty-second-long presence provides a clue to numerous puzzles in the entwined histories of Soviet physiology, studies of conjoined twins and "scientific cinema," which lay hidden behind the film's striking visuals.

⁶ No full-fledged biography of this talented man, often hailed as the founder of Soviet "neuro-cybernetics," is available in any language. There are only a few largely hagiographic publications by his students and several obituaries in various periodicals. See Iu. A. Makarenko and K. V. Sudakov, *P. K. Anokhin*. Moscow: Meditsina, 1976; P. V. Simonov, ed. *Petr Kuz'mich Anokhin. Vospominaniia sovremennikov, publitsistika*. Moscow: Nauka, 1990. But his major works are available in English, see P. K. Anokhin, *Biology and neurophysiology of the conditioned reflex and its role in adaptive behavior*. Oxford; New York: Pergamon Press, 1974. Indeed just a year ago, the book was reissued in the kindle format!

⁷ See P. K. Anokhin, *Ivan Petrovich Pavlov. Zhizn', deiatel'nost' i nauchnaia shkola*. Moscow-Leningrad: Izd-vo AN SSSR, 1949.

Ivan Pavlov and scientific films

"Research on conjoined twins" is a fine exemplar of a particular cinematographic genre – "scientific film," as it was called at the time – that had a long and distinguished history in Soviet Russia.⁸ Following the rebirth of the Russian movie industry after the end of the bloody civil war that had erupted in the wake of the 1917 Bolshevik Revolution, this genre took a prominent place in the industry's production and distribution efforts.⁹ Practically all movie studios, both state- and privately-owned, made scientific films, while the industry's distribution wing bought hundreds of such films abroad for showing around the country. In just a few years, by the end of 1926, the total number of scientific films in circulation had reached 746 (though only 118 had been produced locally).¹⁰ Their subjects ranged from the prevention of venereal diseases to the electrification of the country and from the development of the human organism to the manufacturing of cloth from the cotton. Some of the films were short, just under 5 min long. Others run longer than 2 h. Some were addressed to specialists, others to general audiences. Some were mere recordings of certain scientific experiments, medical procedures and biological or technological processes. Still others were elaborate productions based on specially written scripts and involving professional actors and film directors. These films became part and parcel of huge education and propaganda campaigns to popularize science and undermine religion waged by the country's new rulers, the Bolsheviks. But cinematography also attracted the attention of scientists who began to employ this new tool in their own research.

Physiology figured prominently among the subjects of Soviet scientific films, of both propaganda and research varieties. Physiologists were among the first to utilize the new possibilities offered by cinematography to both record their research and popularize it. One of the first Soviet-made full-length scientific films was produced by Leonid Voskresenskii, Pavlov's former student, at the time a professor of physiology at the Tver Pedagogical Institute. But this motion picture had nothing to do with Pavlovian physiology. Beginning in 1923, Voskresenskii was deeply involved with studies of "rejuvenation" inspired by the extraordinarily popular works of the Austrian physiologist Eugene Steinach and the French surgeon of Russian extraction Serge Voronoff.¹¹ Voskresenskii's research aimed at replicating Steinach's and Voronoff's experiments with vasectomy and sex glands transplantations. Not to be outdone by his Western colleagues whose works had been recorded in several motion pictures, Voskresenskii also documented his experiments with "rejuvenating" animals and humans on film. He detailed his three-year-long

⁸ See a treatise on the subject by the foremost theoretician of the genre, L. M. Sukharebskii, *Nauchnoe kino*. Moscow: Kinopechat', 1926.

⁹ For a detailed overview of the early Russian/Soviet cinematography, see N. A. Lebedev, *Ocherki istorii kino SSSR. Nemo kino: 1918–1934 gody*. Moscow: Iskustvo, 1965, 2-nd expanded edition.

¹⁰ See *Nauchnye fil'my. Opisanie fondov nauchnykh fil'm*. Moscow: Teakinopechat', 1927.

¹¹ For a detailed analysis of the "rejuvenation craze" in 1920s Russia and Voskresenskii's work, see Nikolai Kremontsov, *Revolutionary Experiments: The Quest for Immortality in Bolshevik Science and Fiction*. New York: Oxford University Press, 2013, 127–158.

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