

Piano Mécanique and Piano Biologique: Nikolai Bernstein's Neurophysiological Study of Piano Touch.

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In lieu of an abstract, here is a brief excerpt of the content:

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Julia Kursell (bio)

The noise in the laboratory resembled a Futurist concert: now and again a siren would howl, while a pianist, interrupted by shouted commands, hammered on the same two keys of a piano. What the neurophysiologist Nikolai Bernstein¹ was studying in his experiments at the State Institute for Musicology in Moscow was the “work movements during instrumental performance and the scientific organization of musical labor.”² Or that at least was how a 1926 report on the institute’s work described the research program of the section on the methodology of piano performance, where Bernstein and his colleague Tatyana Popova conducted their experiments on the “bio-dynamics of piano touch.”

At the same time, in the Laboratory for Acting Technique, Vsevolod Meyerhold’s theater workshop in Moscow, actors guided by instructors practiced movements to piano music. The piano sounds used at the laboratory were generally taken from the classical and romantic **[End Page 245]** repertoire, or more precisely, from the preparatory pedagogical program for this repertoire, since the practice was conducted with piano études. “In the age of biomechanics,” one of Meyerhold’s “lab workers” declared in the theater journal *Dramas* in 1922, “the body of the actor-biomechanist works like a machine. Every movement of every muscle group must be perceived by the spectator like a motor reflex of work by the whole body apparatus.”³ The “Taylorization of the theater”⁴ that Meyerhold promoted in a lecture that same year referred to the work of neurophysiologist Ivan Pavlov. “Every psychological state,” explained Meyerhold, “is determined by certain physiological processes.”⁵ When actors place themselves physically in certain situations, they produce reflexively certain emotions in themselves and in the audience; for example, when they move as if they were running from a dog, they will become afraid, and so will the audience.

The experimental research on piano playing that is the subject of this essay placed art and the physiology of labor in a closely related context,

just as Meyerhold's theatrical directing did. This was in no small measure a consequence of the association of scientific and artistic activities that found expression in a series of new institutes founded after the Russian Revolution. One such example is the State Institute for Musicology. Another example is the institute for the physiology of labor: in 1920, the metalworker, trade unionist, journalist, and writer Alexei Gastev founded the Central Institute for Labor in Moscow, and in 1922, he hired twenty-six-year-old Bernstein for its biomechanics department. The Central Institute for Labor, abbreviated TsIT (Tsentral'nyj institut truda), pursued the goal of accelerating industrial development in the Soviet Union by adapting the methods of the physiology of labor and the "scientific management" of Frederick Taylor to the needs of the difficult economic situation in Russia. One element of the "scientific organization of labor," as Taylor's program was translated into Russian, was biomechanics. **[End Page 246]** The term "biomechanics" designated a new theory of the movements of the living body that sought to mechanize the body in the service of improving efficiency and economy.⁶ "There is a lot of talk about wasted energy and the economy of labor. Nevertheless, our first task is to study the wonderful machine that is so close to us: the human organism," wrote Gastev in an introduction to the science of the organization of labor. "There needs to be a special science—namely, biomechanics—that must be cultivated under choice laboratory conditions but can also be practiced in any room at home, outdoors, on any square, in any workshop."⁷

In the biomechanical laboratories of Bernstein and Meyerhold, fundamentally different functions were assigned to the analysis of movement and to piano music. What Bernstein took to be the goal of his efforts—the study of movement—was for Meyerhold a precondition for his work. Meyerhold's staging of Ferdinand Crommelynck's theater play *Le cocu magnifique*⁸ in April 1922 caused a sensation. The production employed movement techniques that had been worked out by the actors in keeping with the biomechanical training program. The training program...

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1. After beginning his studies in philology, Bernstein (1896–1966) switched to medicine. When he was discharged from the Red Army, he began working as a neuropsychologist in a Moscow clinic, while auditing lectures in mathematics. For Bernstein's biography, see Alex Kozulin, *Toward a Social History of Soviet Psychology* (Cambridge, Mass.: MIT Press, 1984), pp. 62–82, as well as Iosif M. Fejgenberg, *Nikolai Bernstein: ot refleksa k modeli budushchego* (Moscow: Smysl, 2004).

2. Mikhail V. Ivanov-Boeckij, *Plat' let nauchnoj raboty Gosudarstvennogo Instituta muzikal'noi nauki (GIMN'a) 1921–1926* (Moscow: Muzikal'nyi sektor Gosudarstvennogo izdatel'stva, 1926), p. 283.

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