

- Page 139, note 22: “the space-time of the special theory is flat, or Euclidean”; actually, Minkowski space-time is flat but definitely non-Euclidean.

There are a number of misprints, some quite amusing: *The First Three Minutes* becomes *The First Three Minuets* (p. xxv n 32), and Fowler becomes flower (pp. xxi and xxii n 19).

Those attempting to situate Eddington’s views in the context of current discussions of the philosophy of science will find much food for thought in this volume.

John Stachel

Nikolai Kremmentsov. *Revolutionary Experiments: The Quest for Immortality in Bolshevik Science and Fiction.* 268 pp., illus., bibl., index. Oxford/New York: Oxford University Press, 2014. (Cloth.)

In a 1925 novella by Mikhail Bulgakov, a medical professor in revolutionary Russia transplanted human glands to a stray dog and observed in astonishment that after the operation the dog began gradually to transform into a human being, albeit a primitive and aggressive one. In the end, the professor decided to call the experiment a failure, reversed the procedure, and forcibly returned the unruly organism back to the dog state. The same year, Aleksandr Belyaev published a fictional story in which an American medical professor discovered a method for keeping a human head alive and thinking, even after it had been severed from its dead body. The inventor, however, fell victim to his own evil assistant, who imprisoned the dead professor’s head and forced it to continue to generate ideas, which the assistant could then claim as his own. Literary scholars have tended to analyze these classic works of early Soviet fiction as examples of social satire. General readers today consume these texts as straightforward science fiction, without realizing that they belong to a specific version of the genre that developed and flourished in early twentieth-century Russia. The plots of “scientific fantasy,” as the genre’s name literally translates into English, were typically grounded in and took inspiration from actual investigations pursued by scientists at the time.

In *Revolutionary Experiments*, Nikolai Kremmentsov follows clues from these and several other lesser-known products of the genre to draw attention to their real-life prototypes in scientific research and discovers that the latter were often as mind-blowing as the flights of literary fantasy. In 1901 Porfirii Bakhmetev announced a technique that allowed him to bring insects back to life after preserving them for an indefinitely long period in a frozen state of anabiosis (neither life nor death). Popularized at the time as opening up a possibility for prolonging life, Bakhmetev’s discovery is used even now as the basis for cryonics—an effort to cheat death by preserving carefully frozen human bodies for possible revival in some distant future. Another possibility for life after death came from a 1925 experiment by Sergei Briukhonenko, who invented an apparatus that provided blood circulation to the brain and managed to keep the head of a dog “alive” for hours after it had been cut off from the body.

The new medical field of endocrinology also promised novel means of revitalizing and transforming the human organism. In 1920 the Viennese professor Eugen Steinach, one of the founding fathers of the discipline, created an international sensation with his announcement of the discovery of “rejuvenation” through surgical manipulation of the testicles or ovaries of the elderly. His technique, as well as another, more complex rejuvenation procedure—the transplantation of sexual glands from monkeys to humans performed by a Russian expatriate in Paris, Serge Voronoff—was widely used and discussed worldwide, including in revolutionary Russia, where it also inspired experiments by Mikhail Zavadovskii on changing sex in chickens and discussion of possible transgender operations in humans. With lesser publicity but more active administrative lobbying, Iakov Tobolkin promoted his project of hormone therapy with thyroid preparations obtained from goat milk, paving the way for the founding in 1925 of the State Institute of Experimental Endocrinology in Moscow.

Krementsov applies the general heading “visionary biology” to this group of experimental projects that sought to radically engineer the human or animal organism, transform its essential functions, and possibly achieve a “victory over death.” He attributes the hyped popular attention that these projects enjoyed in Russia during the revolutionary decade to the temporal collusion of several important factors: utopian expectations fostered by great societal upheaval; the experimental revolution in biomedical science that submitted life to laboratory manipulation; the generous patronage of science by the new Bolshevik government and its policy of establishing large-scale institutions for scientific research; and, finally, an exceptional degree of public interest in science that led to an explosive growth of science fiction and popular science literature in revolutionary Russia.

Most parts of this interpretative formula look convincing to me, with the exception of the assertions regarding the Bolsheviks and their supposed role in promoting the scientific “quest for immortality.” It is often assumed almost automatically that if some important development happened in Soviet history, the political authorities must have been behind it. Quite a few journalists have written in this vein, suggesting—yet without evidence—that the public fascination with the topic of the struggle against death must have reflected the Bolshevik leaders’ preoccupation with their own aging and immortality. A similar thesis has been argued by John Gray in a seemingly academic volume, *The Immortalization Commission: Science and the Strange Quest to Cheat Death* (Farrar, Straus & Giroux, 2011). Despite Kremmentsov’s efforts to document the Bolshevik officials’ support for “visionary biology,” the evidence is mostly limited to a few occasional expressions of polite interest and bemusement. The revolutionary government did worship science; it supported bold research aspirations and wanted to encourage the public fascination with the anticipated progress of science. The Bolsheviks, like many others in revolutionary times, were also prone to utopian thinking and visions for the future. Yet when it came to allocating resources and funding big institutions for research, the Bolshevik government prioritized projects that were quite radical and revolutionary by the standards of the time yet markedly different in style and substance from the promise of visionary biology: the improvement of cultivated plants, rather than of the human stock, for genetics; the production of insulin, for endocrinology; and the national system of blood collection and transfusion, rather than rejuvenation.

A definitive demonstration of Bolshevik attitudes comes from a story that I happened to hear in 1990 when interviewing the late Lev Theremin (1896–1993). Back in the 1920s, the young radio engineer Theremin became famous for inventing the first electronic musical instrument and even had a chance to perform for Lenin. When he heard the news of Lenin’s death in 1924, Theremin rushed to the Kremlin, hoping to use his connections and convince the government to preserve Lenin’s body intact for possible future resurrection; he was certainly not the only one to make such a suggestion. Even in his nineties, Theremin still felt utterly disappointed that the Politburo had decided otherwise, preserving only the outward likeness while giving up the integral interior of Lenin’s body for medical experimentation, including the dissection of his brain. Thus, in the case that mattered to them the most—the immortality of their revered leader—the Bolsheviks ultimately rejected the hope of visionary biology. They did profess belief in the immortality of Lenin’s political legacy and ideas, but, unlike many Russian academics and members of the public, they did not buy into a belief in the future victory over physical death and the possible immortality of the organism.

Alexei Kojevnikov

Karen A. Rader; Victoria E. M. Cain. *Life on Display: Revolutionizing U.S. Museums of Science and Natural History in the Twentieth Century*. xiv + 467 pp., illus., bibl., index. Chicago/London: University of Chicago Press, 2014. \$45 (cloth).

Life on Display examines the transformation of American museums of science and natural history in the twentieth century. The late nineteenth-century New Museum ideal, which valorized public education alongside research, fractured when museums adopted different strategies of collection, display, and