Elena Aronova. *Scientific History: Experiments in History and Politics from the Bolshevik Revolution to the End of the Cold War*. Chicago and London: University of Chicago Press. 2021. ISBN: 9780226761381. Cloth $45.00. ISBN: 9780226761411. PDF or EPUB $44.99.

Review by Phil Mullins

This book is essentially a history of science discussions in the period specified in the title, which is the primary period in which Michael Polanyi was writing about science and society. The author, Elena Aronova, is a contemporary historian of science with a chemistry background who then did doctoral work in Moscow focusing on the conceptual history of immunology. Subsequently she left the crumbling Soviet Union and took another graduate degree in history in California. Aronova here chronicles what she calls "the submerged history of historians' continuous engagement with the methods, tools, and values of the natural sciences" (ix). "Scientific history" is "shorthand for the diverse ways in which scientists and historians reconciled the techniques, approaches, and values of science with the writing of history, particularly the history of science" (4). This book is thus a modern "history of disciplinary crossovers" which maps "various ways in which historians and scientists have exchanged and shared methodologies, approaches and subject matters" (viii).

At least to this reviewer, the story here is a complicated one covering interesting territory about which I knew little. Aronova skillfully sets forth the lay of the intellectual landscape of the twentieth century from a peculiar angle of vision. Her complex narrative puts some of the matters that influenced Michael Polanyi and that Polanyi occasionally mentions into a broad and illuminating historical context.

The piece of the story that I already knew a bit about concerned Nikoli Bukharin, the Marxist theoretician who rejected the distinction between pure and applied science and favored state planning of science. In a watershed moment in 1935, Michael Polanyi met Bukharin in Moscow and subsequently rejected Bukharin's views (see Scott and Moleski, 154-155, and Polanyi's earliest discussion in "The Rights and Duties of Science" [1939] included in *The Contempt of Freedom*). The encounter with Bukharin helped launch Polanyi's own serious investigations of science and his effort to articulate a more satisfactory philosophy of science, a philosophical account that in fact takes the history of scientific discovery very seriously. Like Bukharin, but within a very different Liberal framework, Polanyi became a thinker who sought to make plain what he took to be the proper relation of science and society. What Aronova's discussion makes clear, however, is that Bukharin's philosophical account of science should be seen as a quest for unified knowledge which began in the nineteenth century.

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That quest gathered steam in the twenties, and Bukharin's Marxist approach was a competitor with another quest for unified knowledge which was rooted in Comte and championed particularly by French thinkers. Positivism and Marxism were "two major intellectual formations" (33) that sought tightly to link history and science, and this competition played out in discussions, publications, and meetings in the period in which Polanyi began to be interested in science and society and the nature of scientific knowledge.

Aronova argues that both the Marxist and Positivist quests for unified knowledge stand in contrast to that of the Vienna Circle, who also was interested in scientific unification, but their scientific philosophy excluded history. History was concerned with the unique (and had no "epistemological consequences" [15]), whereas science focused on the context of justification of scientific knowledge. Lying behind the Vienna Circle's account are German figures like Dilthey (whom Polanyi adapts but criticizes), who argued that the object of study in history and the humanities was mind and spirit (Geist)—objects invested with meaning—whereas the objects of natural science were the material world. History is hermeneutical, but the natural sciences focus on discerning causal explanation.

Aronova's complicated account extends well beyond her interesting discussion of Bukharin, whom she focuses upon in her second chapter. This book is organized around the author's portrayal of several "complex life histories" (10) that intersected in the twentieth century. Aronova aims to show that the terms "history of science" and "scientific history" have been used interchangeably and have evolved, and she does this by focusing on her set of life histories. She treats not only the Marxist theoretician Bukharin but also Bukharin's protégé, the Soviet geneticist Nikolai Vavilov (chapter 3), and his conflict with T. D. Lysenko that Polanyi helped publicize (see the extended discussion in "The Autonomy of Science" [1943]). Preceding her discussion of Bukharin and Vavilov, Aronova's opening chapter focuses on Henri Berr, a Parisian philosopher who hosted the first International Congress of the History of Science and Technology in 1929. Berr was a promoter of "historical synthesis" (2) grounded in revived positivist notions of Comte. Berr founded a journal and aspired to unite all available knowledge of the past. Another French intellectual, Lucien Febvre, worked with Berr promoting these views, and later Febvre worked with other important figures. He was a historian and the founder of the *Annales* school of historiography that aimed at a grand synthesis (i.e., a science of the human past) that was the product of group inquiry.

Aronova links Berr, Febvre, Bukharin, and Vavilov with the evolutionary biologist and publicist Julian Huxley (who Polanyi perhaps knew and sharply criticized in his review of *The Phenomenon of Man* [1960]). After the founding of the United Nations, Huxley became the first director of UNESCO and promoted

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the UNESCO "History of Mankind: Culture and Scientific Development" project in the fifties and early sixties, a project that Aronova devotes a chapter to and suggests may be the "largest international collaborative historical project ever undertaken" (110).

There are other figures treated in Aronova's unfolding story of "scientific history," including Polanyi's sparring partner, the Marxist crystallographer J. D. Bernal, and Eugene Garfield (both treated in her sixth chapter). Bernal, like Huxley, "was attracted to the Bolsheviks' dream of a scientific, socialist society" and argued that "the principles of socialist planning, distribution, and ownership should be applied to the sphere of information" (133). He promoted his "vision of 'information socialism'" (134) which incorporated a centralized information network for communication among scientists as well as planning. Bernal's book, *The Social Function of Science* (1939), launched his effort to reform scientific communication. Michael Polanyi treated this book in his 1941 review article, "The Growth of Thought in Society," which is perhaps Polanyi's most important early theoretical article on science and society and is aimed directly to counter Bernal's vision of science. Eugene Garfield also aimed to "modernize the management of scientific information" (139). He promoted to historians of science (later in the twentieth century) the Science Citation Index, a data-analytic tool intended to make history a data science. All in all, Aronova's book does an illuminating job setting forth what she calls "the interwar era's mingling of the informationist and the socialist visions" (134).

The six major figures treated in successive chapters of *Scientific History* were all participants in the 1931 meeting of the Second International Congress of the History of Science and Technology in London, an important international meeting in which the different visions of science and the history of the Marxists and the positivists were presented. Thus, Aronova's effort to follow the "intertwined trajectories" (2) of these twentieth century intellectuals is an effective strategy to set forth a complex account of the way in which important ideas about history and science were brought together in the twentieth century.

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