



**Review: [Untitled]**

Reviewed Work(s):

*Otto Neurath: Philosophy between Science and Politics* by Nancy Cartwright; Jordi Cat; Lola Fleck; Thomas E. Uebel

George Reisch

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stage his scientific protocols in a theatrical manner.

Although Pouchet repeatedly protested the charges of materialism and atheism leveled against him, arguing in favor of the Creator's role in the emergence of new species, Pasteur's shrewd defense of metaphysics and religion (in opposition to the inordinate powers Pouchet attributed to organic matter) would be gratefully acknowledged by the conservatives of the following generation—to such an extent that it inspired an edition of the great man's selected scientific works published under the title *Pages catholiques* in 1943.

Simply making experimentation a keyword does not exempt a commentator from conducting a painstaking and detailed analysis of experimental procedures, especially when the experimentation is said to be crucial; nor does it free one to ignore biases among those who evaluate experiments. In this book, as the term "experimentation" itself emerges more as a motto than as a program, it is not surprising that Boccardi's conclusion remains elusive and leaves his readers with a sense of frustration, whatever their initial interest when they took the book off the shelf.

ANNE MARIE MOULIN

**Pauline M. H. Mazumdar.** *Species and Specificity: An Interpretation of the History of Immunology.* xiv + 457 pp., illus., figs., tables, bibl., index. Cambridge/New York: Cambridge University Press, 1995. \$64.95.

In this elaborate and detailed study, Pauline Mazumdar argues that, for the past century or more, scientists investigating the human immune response have been committed to demonstrating either its specificity or its generality. The "pluralists," who insist on absolute specificity, have included Ferdinand Cohn, Robert Koch, and Paul Ehrlich; among the "unitarians," who assume the continuity of nature, Mazumdar places Matthias Schleiden, Carl von Nägeli, and, most prominently, Karl Landsteiner. As these lists suggest, Mazumdar's book is a study of the centrality of notions of species and specificity in nineteenth-century German biological thought, not just their salience in modern immunology. And as the categories imply, Mazumdar has chosen to frame this historical debate in philosophical terms, bringing Immanuel Kant and Ernst Mach into the canon of immunological thought.

Strangely, then, the book is both more and less than it claims to be. For the first hundred pages

or so, Mazumdar describes a division among German natural scientists between those committed to unity and those committed to diversity. The rest of the book is a study of similar disputes between Ehrlich and Landsteiner, a conflict that their followers—united only in their belief in immunological memory—have reproduced for much of the twentieth century. The story initially is thus one of great breadth, but toward the end the focus narrows to a rather arcane debate in immunochemistry. We should be grateful to Mazumdar for documenting this dispute with such enthusiasm and skill, but we should also ask whether her analysis has exhausted the history of immunology.

Rather than write a comprehensive history of immunology, Mazumdar, it seems, has chosen to illustrate the power of ideas in biology, their transmission through teacher-student relationships, and their refinement in dialogue. But the dialogue here occurs mostly within the laboratory; voices from the clinic are surprisingly muted. Although Mazumdar notes that clinical laboratories liked the idea of specificity (p. 101), she does not further explore the influence of a classificatory medicine on immunological theory. Surely these clinical demands, and the general eclipse of Darwinism, would help to explain the dominance of structuralist notions of specificity at the beginning of the twentieth century. I suspect that in the struggle for authority in immunology, the ideas that counted were not all internally generated, and the allies that counted were not only one's students and laboratory colleagues. All the same, I found Mazumdar's argument a stimulating one—it made me wonder, for example, whether the lasting achievement of Landsteiner and, later, Frank Burnet lies not so much in their ideas as in their attempts to shift the site of production of immunological knowledge from the clinic to the biology laboratory.

But that sort of institutional argument does not seem to interest Mazumdar here. She has written instead a valuable history of specific ideas that gives little weight to contemporary continuities of social and intellectual response: her historiographic assumptions thus uncannily mirror Ehrlich's fixed structuralist specificities.

WARWICK ANDERSON

#### ■ Twentieth Century

**Nancy Cartwright; Jordi Cat; Lola Fleck; Thomas E. Uebel.** *Otto Neurath: Philosophy between Science and Politics.* (Ideas in Context,

38.) xii + 288 pp., illus., bibl., index. Cambridge/New York: Cambridge University Press, 1996. \$59.95.

Recent interest in the life, work, and thought of Otto Neurath (1882–1945) shows little sign of abating. This book does a good job of explaining why. Neurath offers something for everyone. Students of political theory and modern Europe, for example, will appreciate Part 1, which makes available in English Lola Fleck's political and intellectual biography of Neurath. Fleck details Neurath's schooling in economics and political theory, his work and trial in Bavaria during the revolutions of 1919, and his subsequent life in Red Vienna. Here Neurath founded museums and journals, invented a picture language, planned housing, worked for Moscow as a museum expert, and became a leading force in the discussion group (the Vienna Circle) that set the course for twentieth-century philosophy of science. Fleck also recounts (though in less detail) Neurath's exile in Holland and England and his leadership of the Unity of Science Movement he organized in the 1930s and 1940s.

Fleck's biography should stimulate the reader's curiosity about the philosophical foundations that supported Neurath's wide-ranging career. In Part 2, Thomas Uebel tracks (or, better, tacks) Neurath's several uses of his now famous metaphor for knowledge and science: it is like a boat that, since it is at sea, must be maintained and repaired without the dry dock of certain knowledge, without unflinching scientific methods, and without other chimerical dreams of enlightenment and (some Viennese) philosophers. Uebel shows that, while Neurath's colleagues were refashioning philosophy following the era's remarkable developments in physics, Neurath focused as well on methodological issues in history and social science. While the Circle studied Ernst Mach, Pierre Duhem, and others, Neurath collected important pieces of driftwood and timber from, for example, Max Weber, Georg Simmel, and Ferdinand Tönnies. By the time the boat metaphor appears in the early 1940s, Neurath's project had matured into a radical rejection of Vienna Circle orthodoxy and a seasoned conception of how positive science (natural *and* social) should be understood and employed to improve modern life.

Part 3 explores Neurath's changing conception of the unity of science. Drawing upon, and adding to, some of their earlier work, Nancy Cartwright and Jordi Cat attempt to synthesize the thought of Neurath the socialist administrator, Neurath the epistemologist, and Neurath the

advocate of unified science. Their result highlights Neurath's voluntarism and his radical attack (predating Paul Feyerabend's) on method. For Neurath, science is not automatic or methodologically driven. It is an activity driven in the end by will and choice. Why must methods fail? Because, Neurath believed, scientific theories consist largely in clustered concepts—*Ballungen*, he called them—that defy clean analysis and that overwhelm recipe-like methods (such as Karl Popper's). Appropriately, much of Part 3 is dedicated to seeking the sources of Neurath's ideas about *Ballungen* (mainly Duhem, Weber, and the Marxists G. W. Plekhanov and Antonio Labriola).

For historians of philosophy of science, this book is essential reading. It carefully fills in several gaps in the literature (given what is available in English, especially) and extends our understanding of Neurath's long-overlooked role in the development of philosophy of science. Some readers will object that Neurath's ideas neither require nor perhaps deserve the occasionally very slow and incremental reconstruction they receive. Others may object that, in the hands of these unabashed fans of Neurath, his many and various disputes with colleagues (Neurath was famously argumentative and, some said, domineering) are too easily adjudicated in his favor. For example, the last years of Neurath's long relationship with Rudolf Carnap, while the two coedited the troubled *International Encyclopedia of Unified Science*, were often rancorous and stressful. Describing one episode in this dispute, in eight lines, the authors note only that *Neurath* was "deeply hurt" (p. 250). But there are two sides to this story, and Carnap was, in fact, more upset than Neurath. This omission gives the (false) impression that Carnap simply aggressed against Neurath. Does this kind of detail matter? It does, for the authors maintain that Neurath himself was committed to negotiation and compromise—a claim several of Neurath's colleagues (besides Carnap) would have denied.

For the uninitiated, this book may prove daunting. There are stylistic differences between the parts, and, in the last two, the authors move freely through details of Austro-Marxism; through economic planning theory, logical empiricism, and semiotics; through naturalistic epistemology and even postmodernism (though the nod is mercifully brief). Still, as an introduction for the studious, the book nicely emphasizes and recapitulates in its own ways some of the more interesting features of Neurath's life and work. He hated philosophy, for example, yet this book mines valuable ore precisely by situating

him within certain methodological and epistemological questions of his day (and ours). The discussion of *Ballungen* in Part 3, however, tells us that reality is congested and dense. We need a unified science, Neurath argued, because in order to manage the world we need a community of scientists able to combine economics and chemistry and sociology and physics (and so on). Neurath's thought, too, is dense and congested. As this monograph suggests, it may require a community of scholars to allow him to stand before us whole.

GEORGE REISCH

**Albert Einstein.** *The Collected Papers of Albert Einstein.* Volume 6: *The Berlin Years: Writings, 1914–1917.* A. J. Kox, Martin J. Klein, and Robert Schulmann, editors. József Illy and Jean Eisenstaedt, contributing editors. Rita Fountain and Annette Pringle, editorial assistants. xxviii + 626 pp., figs., tables, apps., bibl., index. Princeton, N.J./Chichester, England: Princeton University Press, 1996. \$85, £66.50.

The sixth volume of the *Collected Papers of Albert Einstein* presents Einstein's published work (as well as some unpublished scientific writing) from the first years of his time in Berlin as one of the world's most celebrated and highly paid scientists. In going to Berlin, Einstein left a chair at the Federal Institute of Technology in Zurich. He was uncertain if he would be able to fulfill the expectations of future accomplishments associated with his new position. He brought with him an agenda to arrive at a satisfactory generalization of the theory of relativity that would include accelerated motion as well as gravitation. Effort and dedication produced, late in 1915, the covariant field equations of general relativity, a formulation that has endured to the present day. As a result of this accomplishment, and the subsequent verification of its predictions, Einstein has been apotheosized to an extent unrivaled in our century.

As this volume reveals, Einstein's professional thoughts turned to questions beyond relativity during the years 1914 to 1917. He collaborated with the young Dutch physicist Wander Johannes de Haas on verifying Ampère's molecular currents. He became involved as an expert witness in a patent dispute about a gyrocompass between the German company Anschütz and the American company Sperry Gyroscope. He looked into the theory of heavier-than-air flight. He continued to stretch the envelope of quantum physics, preparing the ground for quantum me-

chanics. For many of his contemporaries, this work in itself would have been the crowning achievement of a career. Einstein's publications also took on a more general character. He wrote appreciations of colleagues. He reviewed books by friends and predecessors. He commented on educational practice. And he took a firm stand against the First World War, notably by signing a pacifist manifesto published in 1917 by Georg Friedrich Nicolai, a proselytizing physiological mechanist who circulated the text at the outbreak of the war shortly after becoming *ausserordentlich* in the Faculty of Medicine at the University of Berlin.

Nicolai was in more ways than one a modern man—he was a notorious womanizer who had married for money. Einstein's own marriage was failing when he arrived in Berlin with his wife, Mileva Einstein-Marić, and two sons. After several months his family returned to Zurich, a move that completed the estrangement from his wife. During these years Einstein became romantically reattached to his widowed first cousin Elsa Einstein, who took care of him when his health eroded. The bond was cemented in marriage following acrimonious and enervating divorce proceedings. As correspondence included in Volume 5 indicates, by the Berlin period Einstein found himself sexually attracted to Elsa Einstein and physically repelled by Mileva Einstein-Marić. The marital change is revealing. With his second wife, Einstein reimplicated himself in his Jewish heritage. Through his first wife and her family, he had been exposed to Balkan nationalism. That liaison, which produced an illegitimate daughter, was by 1902 an accepted path to marriage; the union asserted modernity in its cosmopolitan manifestation, which rejected both church and imperial regime, and in its unconsummated impulse to wed both physical and mental desire. Einstein's second wife was by all accounts *bürgerlich*; she gave him all the latitude he felt he needed in his professional (and even personal) life, while guiding him through bourgeois conventions.

There is no hint of Zionism in this volume. I suspect that as the Zionist cause rose to respectability along with the causes of Eastern European and Arab nationalists, Einstein was steered by his wife to endorse a Jewish homeland. No doubt Einstein felt that European Jews could govern at least as effectively as European Christians had, and Palestine offered a pan-European fraternity the opportunity to remake civilization on a higher plane. This interpretation is consistent with the antiwar document of 1914, which is titled a "Manifesto to Europeans" and implies