

Philipp Frank: The Humane Face of Logical Positivism

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1. A forgotten storyteller

Philipp Frank was an accomplished physicist and philosopher. He was a biographer of Einstein, Einstein's successor to the Chair of the Department of Physics in Prague, a member of the Vienna Circle, a fixture in philosophical life at Harvard University, and—to some extent—in the intellectual life of the postwar United States. Indeed Frank played an important role in developing the Vienna Circle's scientific world-conception in Vienna and later in Prague with Rudolf Carnap.



He disseminated the ideas of logical empiricism and modern scientific thought to laypeople and continued this task in the United States through his institutionalization of Otto Neurath's unity of science movement and his many publications. His friend in America, the philosopher of science Paul Feyerabend remembered, "Philipp Frank was a delight. He was widely informed, intelligent, witty, and excellent raconteur. Given the choice of explaining a difficult point by means of a story or of an analytical argument, he would invariably choose the story. Some philosophers didn't like that".

Yet because of that and for many various socio-cultural and philosophical reasons, Frank and his writings did not enter the mainstream and canon of twentieth-century philosophy of science. He is known usually—and simply—as Einstein's biographer and, sometimes, as a logical empiricist who belonged to the Vienna Circle. Despite the extent and variety of Frank's work, he has been forgotten.

To help revive Frank's significance and to reconsider his roles in philosophy and history of science, his last manuscript, conceived and written basically within 1953 and 1962, has been made available recently—*The Humanistic Background of Science*, a book Frank intended to publish, we believe, but which lay

unpublished in the archives for more than a half century. (It was edited by the current authors and published by SUNY Press in late 2021, the sections below are taken from our introduction that was published along with Frank's edited text.) To put the manuscript in context, we offer here an overview, both personal and philosophical, of Frank's life and work. But we do believe that *The Humanistic Background of Science*, while its intellectual roots extend to Europe, should be understood largely as a product of Frank's professional and intellectual circumstances in the United States.

2. The multilayered significance of *The Humanistic Background*

It cannot be emphasized enough that Frank's recognition and his influence is among the most curious issues in the history of twentieth-century philosophy of science, in general, and the history of logical empiricism, in particular. Frank had, beyond doubt, a very basic and general institutional recognition in the United States: many reviews appeared of his books; he was often invited to conferences, seminars, workshops, and even churches and art galleries. Nonetheless, most of these were related to his local contexts in Boston and New York, and to his well-known biography of Einstein. Among mainstream analytic philosophers in the 1950s and early 1960s pursuing relatively formal studies of theories and methods, Frank was neglected, and his reputation declined, as illustrated by dismissive and sometimes acerbic reviews of his books.

His eclectic and synthetic approach to understanding science remained dominant only among those in New York and Boston who knew him—including Robert S. Cohen and Marx W. Wartofsky. Besides dedicating the second volume of *Boston Studies in the Philosophy of Science* to Frank as a *Festschrift*, they organized and chaired the Boston Colloquium for the Philosophy of Science that “construes the philosophy of science broadly, as [Frank] had advised us to do.” In the first few years, Frank was a relatively stable attendee of the meetings, and his *HBS* may be of particular interest today for the insights and methods it illustrates, as something that originated from such a context and milieu. More broadly, the history of positivism that Frank presents seems poised to improve our understanding of how contemporary science studies, shaped by historical as well as intellectual factors, inherited its current practices and disciplines.

That said, *HBS* is not a systematic methodological treatise. Instead, it shows Frank making integrative sociological and historical points as he appeals to a uniquely broad and eclectic range of primary and secondary sources, including personal and scientific correspondence, biographies, textbooks, handbooks, unpublished materials, journals, and newspapers. He had a sense of where a given story might lead, and the fact that he did not back up his investigations with detailed archival work suggests this general interpretation of his lifework: Frank laid down a new approach to understanding science that emphasized equally its epistemic and social aspects, and that science is primarily a human undertaking.

On this view, Frank remained relatively obscure because he did not have a fully executed and detailed research program that could unite and inspire his colleagues. He additionally lacked organizational skills and often did not follow through on projects (such as a book series in philosophy of science that Frank was to edit for Harvard University Press, a vocabulary of operational definitions with Karl Deutsch, both in the early 1950s). Though his name was often mentioned in the philosophical literature, outside of Boston the success of Carnap, Feigl, Hempel and others overshadowed Frank's work. His influence was real, but not evident for those who had not known him or had not carefully examined the literature of the 1940s and 1950s.

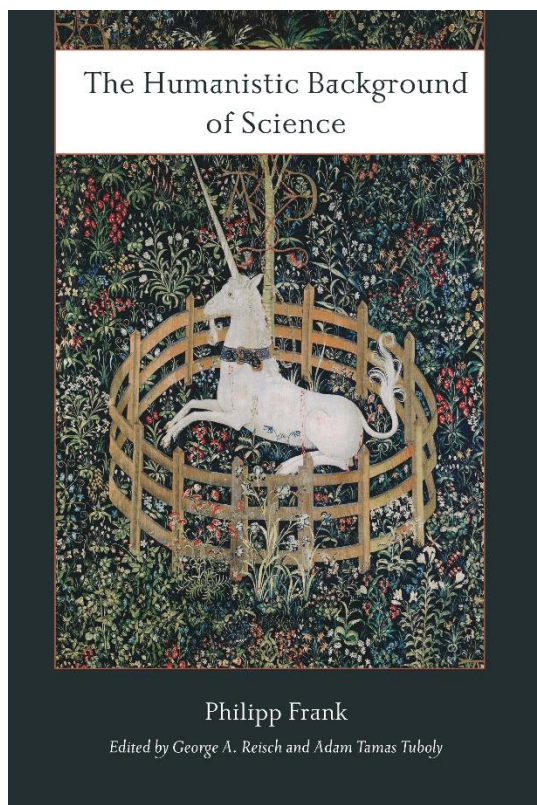
Although this professional neglect may be explained by various factors, it remains to ask how *HBS* might have been received by pragmatists, philosophically sensitive sociologists, and historically inclined scientists had it been published in Frank's lifetime. Frank had made some of the book's main points in scattered papers he wrote in the 1940s and 50s, but we cannot but wonder whether the collected, sustained, and often provocative treatment of these themes in *HBS* might have helped to preserve Frank's reputation for later generations—and possibly kept on philosophy's table some of his interdisciplinary and cultural ambitions.

3. The Main Theses and Approach of *The Humanistic Background*

In broadest outline, the book comprises in part one an exposition of Frank's mature philosophy of science and, in part two, applications of that philosophy of science a number of issues and problems. Given Frank's somewhat mosaical style of writing and assembling chapters, exceptions to this organizational scheme abound and different readers may well identify different issues and problems as central. Indeed Frank himself, in the first chapter of Part I, identifies at least four separate (though related) goals for "the present book":

- (1) "[The] chief topic of the present book will be the pragmatic approach to present day science including the line of descendance from which our present science has originated."
- (2) "[W]e have also to study the meaning of these [scientific] symbols as expressions of human aspirations. Thus, the variety of meanings which have been attributed to scientific symbols is a main topic in the present book."
- (3) "We shall discuss, in the present book, the ways in which these philosophical groups attempt to trace their 'genealogy,' back to scientific theories."
- (4) "We shall learn in the book that when one knows which philosophical approach should be supported, one will find a way to get this support out of several physical or biological theories."

The first two topics indicate Frank's interest in philosophical pragmatism (of Dewey, Peirce, Bridgman, and others) and in the philosophical study of symbols in human life (then strongly represented by the work of Charles Morris). The third and fourth topics capture the relative uniqueness of *HBS* in so far as Frank extends and applies these interests to the sociology of philosophical schools or, as he put it here, "philosophical groups" and to the interpretive uses (and abuses) of scientific theories by leaders and representatives of social and national movements who seek scientific legitimacy for their agendas. "We shall discuss in the present book," as Frank put it in yet another formulation, "the role which the symbols of scientific discourse have played in the struggle for moral and political goals".



To illustrate these struggles, Frank singles out three philosophical schools for extended analysis. The first two are Thomism, endorsed by Hutchins and Adler at the University of Chicago, and pragmatism in its various forms, which Frank gathers under the umbrella of "positivism." The third, Dialectical Materialism, takes Frank not only outside of academic philosophy, but into the ideological core of the United States' cold war enemy, the Soviet Union. Frank treats each of these schools and the factions within them

sympathetically—surprisingly so in the cases of Thomism and Soviet philosophy, especially given the nation’s popular suspicion of Soviet ideology. With something of a sociological or anthropological objectivity, Frank quotes extensively from each school’s internal literature and portrays them as trying to organize and improve society and to “guide human conduct” in ways that inherit the authority and prestige of modern science.

By dedicating long stretches of the book to this subject, Frank attempted to critically enlighten the very publics that advocates of these schools aimed to convert to their respective worldviews and to enlist in their movements. In this aspect, Frank’s project joined the “Conference on Science, Philosophy and Religion” project and the Humanist movement in aiming to educate and enlighten the public about science and its philosophical interpretation and to continue Otto Neurath’s life-long efforts to educate and inform the public about science and its roles in the modern world.

Frank’s hopes for *HBS* to join ongoing discourse about science and democracy were necessarily joined to an internal critique of academic philosophy of science. This critique was surrounded and made urgent by public anxiety about science after World War II. Writing soon after the public learned of the atomic bomb and the threat of nuclear annihilation, Frank understood how this anxiety was often blamed on the nuclear physicists and chemists of the Manhattan Project whose Promethean hubris could only lead to tragic consequences—“A great many people would wish that the vultures get at the livers of the nuclear scientists,” too, Frank writes in his introduction. But philosophers of science, including those in the Vienna Circle and allied groups, had also contributed to science’s postwar reputation. Philosophical accounts of modern theories as formalizable systems of statements devoid of emotion or value encouraged critics of science (including neo-Thomists) to argue that modern science is essentially harmful to cherished human values or to cultural progress.

The most notable American critique of Vienna Circle philosophy in this vein had come from John Dewey, who contested logical positivism’s strict cognitivism and its disregard of norms and values. Frank’s *HBS* can be seen through a similar lens: an effort to persuade American philosophers of science that in fundamental ways Dewey’s critique was important and not to be placed aside if postwar philosophy of science were to have credibility and influence in the modern world.

The task for philosophy of science was not simply to reform itself along naturalist, pragmatist lines or to replace texts by Carnap or Reichenbach with texts by Peirce or Dewey. Frank urged instead the adoption of a historical perspective within which American pragmatism as well as European scientific philosophy could be seen as allied descendants of the original positivist movement. Alongside its analyses of philosophical schools, *HBS* also surveys Comtean positivism and its development—including predecessors, such as La Mettrie in France, and descendants, such as Mach in Austria and Peirce in the United States. This synoptic picture provides Frank a way to unify European logical positivism and American pragmatism within a single “positivist” framework. Thus *HBS* contains a long chapter about how to integrate logical empiricism into American pragmatism and how their common sources could be made explicit.

This unification preserves important innovations of Vienna Circle philosophy (primarily its rejection of “picture theory” epistemology, and recognition of the basic unity of the sciences) and yet tempers the formalism that was fast dominating academic philosophy of science in the 1950s. Logical positivists who wield logical symbols, as well as artists and humanists intimidated by those symbols, can see within this larger framework that logical and scientific proofs as well as poems and works of art meaningfully draw on a larger humanistic background.

Frank’s impulse to portray philosophy of science as a powerful, unified project can perhaps be understood as his response to the growth and, especially, the continuing diversification of scientific philosophy in the postwar United States. What Frank believed should be a unified philosophical front was potentially splintering in different substantive and stylistic directions. Here Frank noted one of these developments—Quine’s now-famous argument that the positivist distinction between analytic and synthetic statements was untenable—and appropriately dedicated parts of *HBS* to his own more holistic and behavioristic view of

theories and their components. This view does not overrate this distinction, much less regard it as a foundational dogma on which scientific philosophy either stands or falls.

This impulse to portray philosophy of science as a still-powerful, unified project, we believe, led Frank to often minimize, if not sometimes ignore, what are today recognized as important differences and disagreements among notable philosophers; and to portray other philosophers in a very pragmatist-friendly light. On the other hand, Frank did not hesitate to spar with his colleagues and perhaps step on some toes. Although he shows that Carnap's criticism of metaphysics could be read and interpreted along pragmatist lines, Frank does not hesitate to suggest that Carnap's formalism ignores at its peril the historical and sociological contexts that shape scientific theory and reasoning.

Even Neurath, whose anti-formalist sensibilities Frank shared, comes in for a quiet yet firm reprimand on the issue of metaphysics. To be sure, Frank remained a proponent of science and a critic of anti-scientific, metaphysical claims. But he finds inspiration in Peirce, Dewey, and Pierre Duhem to suggest that the logical positivist movement was mistaken—in at least two different senses—to categorically dismiss metaphysics as “unscientific” or meaningless noise as it had in the 1920s and early 30s. On the one hand, such a dismissal is historically insensitive to how the historical evolution of knowledge. The same theoretical claim may be seen as cutting-edge science awaiting confirmation, everyday common sense, or antique, outdated knowledge—depending on its context and overall place in the historical evolution of the sciences.

According to Peirce, Frank explains, metaphysical knowledge—properly understood—emerges from common-sense knowledge and experience. Frank thus turns the tables on his colleagues to imply that Carnap's ordinary “thing language” and Neurath's “universal jargon”—upheld as empirical, objective, and non-metaphysical platforms for science—are themselves metaphysical, albeit not in a way that invalidates science or harms its progress. As soon as Frank arrived in the United States in 1938, he wrote to Neurath and reported surprising observations about metaphysical thinking on the part of his students that lead Frank to reconsider metaphysics. Some of these developments are visible in one of Frank's early publications, but they are worked out in more detail in *HBS*.

By examining a wide array of American philosophers, all of whom are more sympathetic to metaphysics than most logical positivists, it becomes clear to the reader that neither a critical analysis of metaphysical concepts (à la Carnap) nor prohibitions on metaphysical terms (à la Neurath's infamous *Index Verborum Prohibitorum*) will serve scientific philosophy well in the American intellectual context that Frank had come to know well by the 1950s. They were handicapped by a blindness to the historical, sociological, and practical needs and purposes served by metaphysical beliefs and metaphysical interpretations of modern science, so they could never succeed in productively engaging, much less, eliminating metaphysics as the movement had pledged to do, for example, in the Vienna Circle's manifesto, *Wissenschaftliche Weltauffassung*, or in early antimetaphysical writings by Carnap, in particular. Frank's *HBS* suggests, therefore, that “the elimination of metaphysics through the logical analysis of language” was a more complex task than logical empiricism had first envisioned.

4. The Humanistic Background in the American Scene

Frank's choice for a title also helps to situate his unpublished book in the intellectual milieu of postwar United States. The word “humanism” had become current in the 1940s with the humanist movement, its magazine, and its original manifesto of 1941. The manifesto, written by the philosopher Roy Wood Sellars and the Unitarian minister Raymond Bragg, called for a new, humanist religion built upon a naturalist, evolutionary worldview and dedicated to “the complete realization of human personality” within “a socialized and cooperative economic order”. Reflecting the socialist ideals that many Americans had warmed to during the depression-era, the manifesto was signed by a roster of scientists, theologians, and philosophers.

The most notable philosopher to sign was Dewey, whose anti-Thomist article “The New Failure of Nerve” (coauthored with Hook and Nagel) echoed the manifesto's call “to elicit the possibilities of life, not flee

from them.” The movement also influenced Frank’s colleague Charles Morris who offered his own humanist prescriptions in his book *Paths of Life: Preface to a World Religion*.

In 1956, Frank was interviewed in the pages of *The Humanist*, where he discussed themes dominant in *HBS*—science’s thoroughly naturalistic worldview, the compatibility of modern science and contextual, non-absolute ethics, and essential roles for values in the scientific enterprise. The interviewer, Edwin H. Wilson, joined Frank in appreciating logical empiricism as an ally of the movement (“I knew, through the interest of such men as Rudolf Carnap, Herbert Feigl and Charles Morris, as well as Frank himself,” he wrote as he introduced Frank to his readers, “that logical positivism is one of the various philosophical methods that arrives at an ethical position essentially compatible with humanism”) and concluded the interview with a ringing endorsement of logical positivism as “essentially humanistic.”

As historians of philosophy now acknowledge, however, both philosophical pragmatism as well as public political engagements of the sort that Dewey, Hook, Hutchins, and others routinely undertook in the 1930s and early 40s declined rapidly in the years after the war. With few exceptions, the advent of the cold war and the nation’s prosperity (relative to the depression of the 1930s) inaugurated for most scholars a new professionalism that prized internal, scholarly research and debate and that minimized (if not stigmatized) public advocacy and even scholarly engagements with controversial, politically-charged subjects, such as Marxism or atheistic humanism.

Against this backdrop of increasing professionalism and depoliticization, *The Humanistic Background* stands in bold relief and documents Frank’s sustained interest in politically perilous topics (such as Marxism and Dialectical Materialism) and his relative lack of interest in the professional and disciplinary boundaries then growing stronger in the American academy. This includes, for example, boundaries between philosophy and history, literature, religion, and the then-nascent field of Russianism; and, within philosophy, between analytic, continental, pragmatic, and sociological approaches to knowledge. At a time when most established philosophers of science were narrowing their disciplinary methods and goals, Frank’s manuscript glides easily—maddeningly, contemporary readers may find—from discussions of important philosophers (Carnap, Quine, Whitehead, Dewey, Peirce, Neurath, and others) to sequential expositions of subjects like Thomism, Marxism, sociology of knowledge, historicism, theology, and even interpretation of the Bible.

Owing to Frank’s multilingualism, *HBS* is also unique for the quotations it contains and the sources it might have brought to wider attention, were it published in its time. These include passages from George Lukacs’s *History and Class Consciousness*, an influential book first published in English in 1971. It also includes quotations and summaries of French writers, including Édouard Le Roy, Edmond Goblot, Émile Littré, Henri Bergson, and Abel Rey, as well as quotations from writings by Frank’s colleagues Schlick, Hahn, and Neurath that were not yet translated into English. Frank’s knowledge of Russian allowed him to translate and quote writings by the Soviet philosophers and physicists Sergei Vavilov, Abraham Ioffe, and Mark Borisovich Mitin. Any reader of *HBS* who did not read Russian would also have learned about Russian university textbooks (scientific and philosophical) and the Great Soviet Encyclopedia.

5. *The Humanistic Background*, Thomas Kuhn and the Socio-Historical Approach to Scientific Knowledge

Sustained attention to the sociology of scientific knowledge in *The Humanistic Background* will legitimately lead to comparisons with Thomas Kuhn’s influential and well-known book, *The Structure of Scientific Revolutions*, traditionally credited with inaugurating interest in the historical, sociological, and psychological study of science. This comparison is not abstract, for Frank’s mature philosophy of science, his activities on behalf of the unity of science movement, and Frank himself—the friendly, talkative fixture in and around Harvard Yard—belonged to the intellectual landscape in which Kuhn became a historian of science and began to write *Structure*. As an undergraduate, Kuhn arrived at Harvard in 1940, one year after Frank, and studied with him, most likely in the physics department. After completing his Ph.D. in physics, however, Kuhn became a historian of science and, beginning in the late 1940s, taught alongside Frank within President Conant’s General Education Program.

Besides their proximity to each other and their shared interests in physics and philosophy, both Frank and Kuhn had important relationships with Conant. Frank, we noted, owed his position at Harvard to Conant, and Kuhn did, as well. Conant and his then-new General Education Program offered Kuhn a welcomed opportunity to leave physics and to teach the history of science. Behind both Frank's and Kuhn's theorizing about science, moreover, lay Conant's book *On Understanding Science*, a book that introduced Kuhn to the case-study approach to teaching history of science that he implemented in *Structure*, and whose central concept of "conceptual schemes" tacitly circulates in both *Structure* and *HBS*.

The path that would lead Kuhn toward writing *Structure* also involved Frank and the unity of science movement. For the book was originally commissioned in the early 1950s as a pamphlet in Neurath's *International Encyclopedia of Unified Science*. Frank was at this time an official editor of the encyclopedia (succeeding Neurath after his death), but no evidence exists showing that Frank and Kuhn discussed his contribution. It was rather Frank's co-editors, Charles Morris and, to a lesser extent, Rudolf Carnap who shepherded *The Structure of Scientific Revolutions* to its eventual publication.

In *Structure* itself there is scant reference to philosophical writings by Frank. There is some evidence, however, that Kuhn formed his ideas partly through collaboration and discussion with Frank. One archival document, for example, is an invitation from Frank to collaborate within Frank's Institute for the Unity of Science on a new committee to promote and organize research in sociology of science. The committee already had on board two of Frank's close friends, namely the sociologist Robert Merton and the philosopher Ernest Nagel. Frank included a short description of "possible research topics for sociology of science" that includes interpretation of data and the metaphysics behind verbal differences; the relation between conceptual innovations and experiments; scientists' resistance to discoveries; the factor of scientists' age scientific research; and roles and effects of specialization.

Frank's new committee was active for a while and tried to organize actual research, but it is obvious that it was Frank who took these topics seriously and worked on them for years. *HBS* can perhaps be profitably read as the final result of the research done in this 'sociology of science' group from a logical empiricist point of view. However much or little this group may have sparked or influenced Kuhn's developing ideas, given Kuhn's aim in *Structure* to reform, if not dramatically refute, logical positivist orthodoxy, and given Frank's stature at Harvard as a Vienna Circle logical positivist, it seems likely that this encounter guided and encouraged Kuhn as he began to theorize the nature of science as a professional historian of science.

While there is some anecdotal evidence for Frank and Kuhn's personal acquaintance as well, more importantly for those who are interested in the origins and germination of Kuhn's influential ideas and, more broadly, the midcentury history of philosophy of science in America, it is *HBS* that may repay careful reading. For there can be little doubt that it illustrates a kind of integrated philosophy-history-sociology of science a decade or more before it became popular in the 1970s.

6. Evaluating *The Humanistic Background* Today

Perhaps the greatest strength of *HBS* is the way Frank's external and internal critiques join and call for a common remedy. In broadest strokes, the reason why complaints and misperceptions about science issuing from dictators (Joseph Stalin), popular theologians (Fulton Sheen), Thomist philosophers (Jacques Maritain), and poets (Archibald MacLeish) were so influential at midcentury—the external critique—had much to do with the enduring formalism and epistemological purism—the internal critique—that helped to professionalize, but publicly marginalize, scientific philosophy in this postwar landscape. In this largest aspect, then, *HBS* can be seen as Frank's attempt to Americanize the philosophical movement he had helped to create in Europe so that it may yet achieve the jointly intellectual and cultural goals of the Enlightenment that it pursued decades before.

That said, *HBS* is no lost masterpiece. However one assesses Frank's programmatic vision for midcentury philosophy of science, the scholarship behind it is occasionally sloppy. At its worst, it sometimes lacks clarity and coherence. Whether or not this is best understood as due to Frank's incipient health problems, his

last book occasionally presents the reader with puzzles, false dichotomies, and overstatements—some of which Frank himself confesses are “flippant.” Frank’s eagerness to reconcile American pragmatism and logical empiricism seems to get the better of him, for example, when he writes, “That our pictures of the physical universe are not based upon intellectual research, but are influenced by our moral and political ideas, has been strongly upheld and lucidly presented by John Dewey”. Or, in his enthusiasm for the sociology of science, Frank occasionally loses sight of empiricism: “We have learned, however, that the ultimate decisions between hypotheses in astronomy or physics are determined by sociological arguments”.

Many readers may be puzzled not only by the book’s unconventional themes and subject matters, but its two-part architecture to which Frank added a relatively short tribute to Albert Einstein that he labeled “Appendix.” We present it as the book’s “conclusion,” even though it does not contain doctrinal summaries and proclamations one might expect to find at the end of a philosophical book about science. For one way to make sense of the Appendix is to suppose that Frank chose not to conclude his book by taking a stand on one or more doctrinal positions or theses. He chose instead to introduce Einstein—as he did in *The Humanist* magazine—as an exemplary philosopher of science whose personal “cosmic religion” draws on the array of epistemological, methodological, and cultural issues covered in *HBS*. The concluding thrust of Frank’s book, that is, is not to embrace a doctrinal position (à la Thomism or dialectical materialism), but to find one’s own way in life, or in science, as Einstein had, with an awareness of the intellectual as well as practical resources available within our shared humanistic background.

This is what Paul Feyerabend meant, we suggest, when he recalled that “given the choice of explaining a difficult point by means of a story or of an analytical argument,” Frank “would invariably choose the story” (Feyerabend 1995, 103). Frank endorsed stories not because he was unable to produce sophisticated and sharp formal arguments, or because he believed that they are unimportant. He believed rather that the stories we tell ourselves allow better access to science’s humanistic background. That background, in turn, guides our understanding of the world, our place in it, and the potentialities it offers. The stories Frank provided and applauded may be sometimes inconsistent, or filled with tensions that pull in different directions. But as his experiences of the Mach-Boltzmann debate and the interpretations of Einstein’s theories had taught him, theoretical mosaics can be put together in many different ways.