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ON THE VIENNA CIRCLE IN EXILE:
AN EYEWITNESS REPORT

During its most vigorous period, the Vienna Circle movement was, by and large, kept rather marginal by the political and academic forces in its European home; they tended to see it as a dangerous search, in the Enlightenment tradition, for a world conception that would be free from metaphysical illusions, free from the kind of clericalism that had a strangle-hold on state and university, and free from the romantic madness of the rising fascist ideology. The wonder, in fact, is that in its day, against such opposition, the Vienna Circle commanded adherence by such an array of distinguished intellectuals, even if they were only a small fraction of the total intelligentsia.

By sharp contrast, remnants of the Vienna Circle group that migrated to the United States in many cases eventually found colleagues and university administrations intrigued by and open to their continuing work. This essay, dealing with what was perhaps the most successful example of this transplantation into more accepting soil, bases itself on the personal eyewitness experience and selected documents in a particular case, that of the discussion group founded in Cambridge, Massachusetts; in fact it lasted fourteen years—two years longer than the official lifetime of the organized Vienna Circle in Europe (1924-1936).

Moreover, we shall be touching on another asymmetry between the experiences in Europe and the U.S.A. The details of the actual meetings of the Circle in Vienna are still largely unpublished, whereas within the compass of this essay I can give at least a glimpse of the participants and topics of the meetings in Cambridge which I had the good fortune to attend, beginning during the time when I was still at the graduate-student level.

I know of only two graduate students who were allowed at the original Circle's meetings in Vienna. One was Herbert Feigl, and the other a 20-year-old student of Hans Hahn, Rudolf Carnap, and Moritz Schlick, named Kurt Gödel. We do know in general how the Circle tended to operate, both in its informal meetings and in the more formal Thursday sessions under Schlick. Thus Carnap's pocket diary, kept at the University of Pittsburgh Library, has such entries as: 13 Nov. 1928, Discussed with Gödel in the Cafe from 5 to 9 pm, concerning foundations of mathematics. 30 Nov.: Morning in the Arkadencafe with Gödel, Waismann, Feigl, Natkin. On another day, Cafe Reichsrat with Feigl, Gödel, Waismann, on Gödel's discovery of the incompleteness of the System of the *Principia Mathematica*. And finally, on 15 Jan. 1931, Gödel presents his work to the full group in one of the closed sessions in Schlick's circle.¹

All such activities were stopped five years later by the country's highest authorities. But the Circle did not disappear entirely. Many of its members emigrated to

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foreign countries where local scientists and scholars shared their ideas and fascinations, at least to some degree, and joined them in the resumption of their meetings and debates. In his autobiography, W. V. Quine—who should know, because in fact he was a visitor to and speaker at the original Circle's meetings in Vienna in 1932-33, as well as a participant at the analogous meetings in the Boston area in the 1940s and '50s—wrote of those latter occasions that they could be called "a Vienna Circle in exile."²

The United States was intellectually ready for the migration of the members of the cognate groups from Vienna, Prague, Berlin and other European centers such as Warsaw, Budapest, Paris, and Rome. It was prepared by virtue of the characteristic philosophical tradition associated with such names as C. S. Peirce, William James, and John Dewey. For example, Ernest Nagel in New York and Charles Morris in Chicago—both personally involved with the original Circle—were active hosts, and in the Boston area, there were sympathizers such as P. W. Bridgman, W. V. Quine, Dirk Struik, and Norbert Wiener.

As it happened, Bridgman and Quine were effectively the local arrangements committee for the Fifth International Congress for the Unity of Science, a summit meeting of the Circle and its sympathizers, which was held at Harvard University from September 3 to 9, 1939—just as war was breaking out in Europe. In the Harvard Archive's Bridgman collection is the original list of the large number of expected speakers (Figure 1), and it indicates the distinguished group that met at that bewildering moment of history. As if to accentuate the different attitude awaiting them on that shore, the Congress participants were greeted by the president of the university, James B. Conant. (It may have helped that Conant regarded Bridgman highly, with whom he had even co-authored a paper during Conant's graduate studies.) Many who had crossed the ocean for this meeting were to remain in the U.S., for example, Richard von Mises, who had just completed his *book Kleines Lehrbuch des Positivismus*. Philipp Frank had come earlier from Prague to do a lecture tour of the U.S., and of course he also stayed on. Other ex-Europeans who were interested in what was then called a "scientific approach to philosophy" came to join them.

Thus it came about that by the early 1940s there was in the Greater Boston area a critical mass of expatriates, including Leon Brillouin, Karl Deutsch, Giorgio de Santillana, Frank, Roman Jakobson, Gyorgy Kepes, Philippe LeCorbeiller, Wassily Leontief, George Uhlenbeck, Joseph Schumpeter, and Laszlo Tisza, all of whom later appeared on the roster of the meetings of the reconstituted Vienna Circle in Exile. (Herbert Feigl and Carnap—who had come earlier—and Hans Reichenbach also became centers of closely related groups in the U.S.A., far from Boston.)

The spark plug for instituting these meetings in the Boston area was the physicist and philosopher Philipp Frank, later to be the biographer of Einstein, whom Frank succeeded when Einstein left the German University in Prague in 1912. Frank had been a principal participant both of the predecessor of the movement (1908-1912) and later of the mature form of the Vienna Circle in the 1920s and '30s. From 1939 on, he was a part-time lecturer on physics and philosophy at Harvard; but his burning urge to meet with like-minded discussants was undiminished. The drive to in-

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terdisciplinarity, in the Unity of Science tradition of positivism-so emphasized by Otto Neurath's work on the *International Encyclopedia of Unified Science*-was evident even in the name Frank gave the new meeting series: "Inter-scientific Discussion Group." (See Figure 2 for a typical letter of invitation.) The same attitude was evident also in the spread of competencies of the program committee members, and in the group's merciless striving for clarity, as in its announcement that on January 8, 1945, "Professor R. von Mises will lead a discussion on 'Sense and Nonsense in Modern Statistics.'" In the same spirit, the next meeting's invited speaker was Charles Morris, then in New York, who was asked to come and provide "precise terms for the often-made vague statements that scientists seek simplicity or economy in their theoretical work."

The expectations for the performance by a speaker were evidently high, and the tolerance for any "quasi-mystical" attitude was low. This appears also from an earlier letter which has survived from that series, in which the philosopher C. J. Ducasse at Brown University wrote to Frank on October 4, 1944. The speaker of the previous evening had been the historian and philosopher of science, Giorgio de Santillana of MIT. In Ducasse's view, de Santillana had apparently shown signs of believing in a "quasi-mystical, unanalyzable sort of event." Ducasse's letter also indicates that the old aim of the Vienna Circle and its Ernst Mach Verein-to missionarize among the general public-was still alive, for Ducasse offered to write "a little book addressed to the general reader, under such title as 'What is Science?'" In the invitation to him to present just such an idea for discussion, he was admonished to keep in mind conveying to the public the idea of the unity of science, i.e., to "bring out the common elements in the methods used by scientists in different fields." That aim was of course an article of faith of the whole group throughout, harking back to the message in the Vienna Circle manifesto of 1929, Camap's *Der logische Aufbau der Welt* of 1928, the 1911 Manifesto of the Society for a Positivistic Philosophy, and even to a godfather of the whole movement, Ernst Mach himself.

Let me insert here some autobiographical remarks which might be useful. When I arrived at Harvard in 1943, to work in the war-time laboratories and in the instruction of radar, I happened to be assigned a desk in a room in Jefferson Physical Laboratory which primarily served as the office of Philipp Frank. Like everyone who met him, I admired this gentle scholar. He seemed to be a link in a charismatic chain going back to Ludwig Boltzmann, under whom he had started his PhD thesis, to his early patron Ernst Mach,³ and to his friend Einstein. At some point Frank invited me to attend these meetings of the Inter-scientific Discussion Group. When the war ended, I returned to my graduate studies, but also was promoted to be Secretary of the group, inheriting that office, together with the previous files, from a young associate of Norbert Wiener at MIT, Pesi Masani.

The list of speakers and topics of the first few meetings of the group include the following: Giorgio de Santillana, "The Real Difficulties of Empiricism"; Talcott Parsons, "Psychoanalysis and the Theory of Social Systems"; Richard von Mises, "Science and Nonsense in Modern Statistics"; Norbert Wiener, "The Brain and the

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Computing Machine"; George Wald, "Biology and Social Behavior"; C.J. Ducasse, "What is Science?"; John T. Edsall, "Stability and Flux in the Living Organism"; Y. K. Chao, "Symbology and the Chinese Language"; John T. Edsall, "Life Work of Dr. Walter Cannon, and Future Programs [of the group]"; Hudson Hoagland, R. W. D. King, and Wassily W. Leontief, "Relation of Hypothesis and Experiment in Different Sciences"; I. A. Richards, Samuel Beer, E. C. Kemble, P. LeCorbeiller, and E. S. Castle, "General Education." It is evident that there were no bounds to their curiosity.

A feeling of the actual discussions that took place in such meetings may be conveyed by the Secretary's summary for Dec. 17, 1945, when the discussion, led by Leon Brillouin, Jeffrey Wyman and W. J. Crozier--the last of these a student of Jacques Loeb--was on "Living Organisms and the Second Principle of Thermodynamics":

Brillouin pointed out that in many phenomena which are significant for life, such as burning of coal, combustion of sugar, there is a kind of potential mountain which prevents reaction which occurs only under "proper conditions." In all these cases the 2nd law gives no information about when the reaction will take place, nor how fast.

Bridgman raised the question as to whether the systems considered in biology were thermodynamics systems--that is, macroscopic systems with methods of determining their temperature, mass, etc. [Because of] the fact that the eye is excited by only four or five photons, the delicate synthetic processes of the cell would suggest that biological systems are not thermodynamical ones.

How is a biological system defined? The relevance of the environment to biological phenomena exhibits the difficulty. Are the parts of a living cell alive? Where is the boundary line between the living and the non-living?

The structural permanence and self-regeneration of living organisms was suggested as a distinguishing characteristic. But Frank inquired why one does not also on that basis regard an atom of iron as a living organism. There is no reason to suppose that the electrons, protons, etc. preserve their identity through the "life" of the atom. Frank stated that the probability of biology discovering any new physical laws is rather small because the units dealt with (cells, microorganisms) are too large. The epigram of Russell was quoted concerning the question of whether living organisms are anything more than a complicated system of atoms spinning in their orbits. "It is a political question."

One wishes there had been a sound recording device in operation, and again at other meetings, for example when the general topic was the problem of Meaning, led by Roman Jakobson, Quine, and Bridgman.

Let us look more closely at the width of the spectrum of interests of this group. After circulation of a preliminary sheet to the members of the informal program committee in 1945, the final form of the listing of areas of interests for these meetings (Fig. 3) makes the important point that in addition to the logic of science, which one remembers to have been one of the central interests of the old Vienna Circle, there appear here as main topics explicitly also the psychology and sociology of science. So did the very first invitation letter that has survived, dated 25 September 1944, which announced: "A group has been formed at Harvard that is interested in

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considering science as a whole in terms of the scientific temper itself, and in the study of the logic, psychology, and sociology of science."

All this is at variance with recent characterizations of logical empiricism. Particularly those who now dismiss that particular philosophy of science forget that an active concern to include in the understanding of science the lessons of history, psychology and sociology of science, so fashionable today, was current among those scholars--and not only in the mid-1940s; one only needs to look at the previous work of Otto Neurath, Hans Hahn, and Edgar Zilsel.⁴

I can underline this point by noting that when the rather informal Discussion Group was converted in 1947 into the *Institute for the Unity of Science*, which acted under the umbrella of the American Academy of Arts and Sciences in Boston, its charter defined its purpose as follows: "to encourage the integration of knowledge by scientific methods [and] to conduct research in the psychological and sociological backgrounds of science..." Writing in 1950, Philipp Frank explained the reason for pursuing this goal in these words:

During recent decades, substantial progress has been achieved by considering the sciences as formal systems and by analyzing them from the logical and semantical viewpoint... However, it has turned out more and more that these problems cannot be settled definitely on the basis of logical and semantical analysis. There remain always several possibilities for the choice of a formal system. Carnap contrasted recently in an excellent way the "internal" problems which can be solved by logic and semantics with the "external" problems. The latter ones put the question whether a certain formal system, as a whole, with the addition of a semantical interpretation, is useful for the orientation of man in the world of experience. Here we turn from the logical and semantical to the pragmatic viewpoint... What kind of argument do we call "pragmatic"? To get the answer we have to consider science as a human enterprise by which man tries to adapt himself to the external world. Then a "pragmatic" criterion means, exactly speaking, the introduction of psychological and sociological considerations into every science, even into physics and chemistry. It seems, therefore, that the sociology of science, the consideration of science as a human enterprise, has to be connected in a very tight way with every consideration which one may call logical or semantical.

As if to make quite sure that the point would not be lost, Frank ended by repeating it: "...by the combination of the logical and the sociological approach to science, all the needs which have produced traditional philosophy and metaphysics can be satisfied." The four issues of the Academy's *Proceedings* volume in which this article appeared contains essays in the same spirit.⁶

As I have pointed out elsewhere,⁷ the link between the I.U.S. and the Academy was not accidental, but yet another example of the symbiosis between the Europeans' urge toward *Einheitswissenschaft* and similar American tendencies. As Frank explained,⁸ the distinguished literary historian Howard Mumford Jones, on succeeding the astronomer Harlow Shapley as president of the American Academy, had expressed the hope in his October 1944 inaugural address of overcoming "the fractation of knowledge" through an encouragement of the "pressures toward unity", for which the Academy, which embraced members of all scholarly disciplines, seemed particularly well suited. A committee of the Academy to implement

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Jones's call soon agreed, calling for programs that would support the "synthesis of knowledge." In founding the Institute for the Unity of Science, Frank and his colleagues provided one of the more visible responses to this call. In his published "Greetings" of April 1950 to the first national meeting organized by the Institute, President Conant of Harvard again provided support by lending his prestige and by recording his welcome for this effort. He confessed to being "deeply interested in the unity in science", and saw its pursuit to be a precondition for achieving his plan for the General Education program in science for undergraduates, then being implemented at the College.⁹

The energy and persuasiveness of the leaders of the movement were enormous, and they vigorously aimed to expand their claim to attention by other American scholars. An example is found in a letter of 29 October 1950, conveyed by Charles Morris on behalf of the Institute, to Robert K. Merton at Columbia University. They wrote him that the Institute planned to issue bibliographies on key fields of interest; therefore, the letter continued, "we wish very much that you would do one on the sociology of science." So years before that field had begun to draw general attention in academe, the Institute had targeted it, as well as engaging the obvious person to undertake a bibliography.¹⁰

I think by now you have guessed a main point I want to make here: The Vienna Circle in Exile learned from the interests of those it encountered in its new surroundings, and adapted itself to them, while at the same time also taking every opportunity to propagate some of its older views. But I am getting ahead of my story. I want to turn to some documents that serve to give a taste of the meetings of the Inter-scientific Discussion Group, namely the attendance sheets that were circulated at most of the meetings. To give an example, Fig. 4 carries the names of persons at the fifth meeting of the Inter-scientific Discussion Group, held in February 1945, during which Norbert Wiener made the presentation noted before. Among the attendees were Walter Pitts, a mathematician working with de Santillana; Raphael Salem, a mathematician from France who returned there later on; the philosopher Aron Gurwitsch, a phenomenologist at Brandeis University; Philippe LeCorbeiller, a learned professor of electrical engineering from France; von Mises; Bridgman; Uhlenbeck; Kemble, the distinguished physicist; Felix Chemuschi, from the Division of Engineering at Harvard; and others.

The attendance sheet for the sixth meeting (Fig. 5) adds to the sense of the number and variety of the participants. George Wald spoke on "Biology and Social Behavior", on March 21, 1945; there were present (among others) the sociologist Talcott Parsons, the biochemist John Edsall, the economists Paul Samuelson, Leontief, Haberler and Schumpeter; the astronomer Harlow Shapley; the physicist George Uhlenbeck, the electrical engineering professor, Ronald King; Bridgman; Norbert Wiener; I. A. Richards from England; A. Sprague Coolidge, physicist and chemist; and de Santillana. (Incidentally, of the thirty- three persons in that room that night, five later attained Nobel Prizes.)

The seriousness of the participants, their variety and their quality are astounding to anyone who looks through the attendance sheets of all the meetings.¹¹ The same

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persons come up frequently, the reason being in part that each invitee had to agree to come fairly regularly; otherwise, they would not be circulated again. Invitations to join were sent to anybody who was suggested within the group to be susceptible. (The mailing list of the people who had been contacted still exists.) Regular attendees could bring visitors; but if they failed to come a few times, they would be dropped. The Secretary's files contain earnest letters of excuse, for example from Edwin G. Boring, Henry A. Murray, and Crane Brinton.

I have already mentioned President Conant of Harvard twice—once when he welcomed the Fifth International Congress of the Unity of Science at its opening meeting on September 3, 1939, and again when he spoke about the relationship of the Unity of Science movement to his new General Education program at the April 1950 national meeting. I suspect that Philipp Frank, from the moment he arrived at Harvard in early 1939, communicated to Conant the idea that through the pursuit of unification one could achieve a different view of culture from the usual one of a university splitting into divisions and departments. Conant was ready to hear this. Early in 1936, then three years in office, he had given a talk in which he said he had noticed that year-by-year the catalogue of courses given at Harvard was getting thicker and thicker, that evidently a splintering of knowledge was occurring. He suggested that as administrator he longed to reverse this process. I feel sure that Frank saw his opportunity and told Conant that there *is* a way: through unification among the sciences and other areas of knowledge.

Evidently Conant thought the General Education program was a step in the same direction. The original idea, described in a book published by the Faculty Committee charged with designing the program (*General Education in a Free Society*, Harvard University Press, 1945), was that in the physical and biological sciences, in history, and in each of the other major fields, there would be one historically based survey course, each taught by a distinguished senior person, presenting an overall view of the whole field. Thus, when the program was implemented, George Wald gave a one-year course of this sort on biology; Philipp Frank taught one for more advanced students on philosophy of science; Kemble ran one on the physical sciences. LeCorbeiller and several others on the list of the Inter-scientific Discussion Group, including myself, were similarly involved. Conant himself, though busy as president, went into the classroom three times a week for his course "Nat. Sci. 4", and helped to develop textbooks for it, centered on case studies in the history of science. Thereby he provided also a role model for the faculty; moreover, he invited the heads of all those courses once a month to a splendid dinner followed by shop talk, which energized them even more. So the General Education program was yet another outlet for the unification ideal, at least for some of the faculty at Harvard.

The fact that the president of the university repeatedly showed his active interest in at least some aspects of the Vienna Circle in Exile suggests that I reemphasize a point made earlier in passing: When the storms of war had tossed remnants of the Vienna Circle on the shores of Harvard Square, MIT's Kendall Square and beyond, a strange reversal of fortunes occurred. Back in Europe, these scientists and scholars had been kept at bay by the higher authorities, and not much respected by some

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of their professional colleagues and by the bulk of the student-body. Arriving in America, many faced unfamiliar material hardships; but at least some of them were warmly greeted by the president of the university, were accepted comfortably by their colleagues who admired them for their scholarship, and had access to large groups of more or less respectful students. It is a suggestive idea that the hostility they had experienced in Europe, and the welcome that awaited them in America, were the respective offspring of the competing worldviews that, on a larger scale, propelled the two continents into battle with each other.

Let me turn to other high points in the life of the Boston branch of the Vienna Circle in Exile. As one would expect from a group that had learned how to persevere and gain public attention against all obstacles in Europe, their ambition in America was also not confined only to the local scene. As I mentioned, the local Inter-scientific Discussion Group converted itself in 1947 (with some grant funds from the Rockefeller Foundation) into the International Institute for Unity of Science, housed in the American Academy of Arts and Sciences in Boston. The group was now trying to be a successor to the old intellectual discussion circle, as well as to the Ernst-Mach-Verein with its external, proselytizing functions, including public lectures and a publication series. It also aided Neurath's work in exile, first in Holland and then in England, and supported the enormous labors of the *Encyclopedia*, launched by Neurath, Camap, and Morris at the University of Chicago Press.

Figure 6 is a draft of the description of the Institute as it presented itself to the outside world. Let me point to a few interesting sections. One of the outreach aims was "to stimulate the interest in these issues among college students, college faculties, and among the public at large." The Institute arranged an essay contest for students all over the United States. It edited the *Encyclopedia*. It started research and projects in the fields of semantics, logic of science, and sociology of science. It arranged discussion groups and meetings at several places. It had become a voting member of the International Union for the Philosophy of Science, and there were other international connections-- French, British, Dutch, Swiss, Scandinavian, Belgian, and Italian. And it cooperated with the "movement for general education." Thus, soon after the war was over, contact had been reestablished from the Boston area with countries in which there had been members of or sympathies for the Vienna Circle, and new activities abounded.

When an institution gets confident enough, it prints a letterhead. Figure 7 is a letter from the Institute for the Unity of Science, displaying its Board of Trustees. Philipp Frank is president; Charles Morris, vice president; Ernest Nagel, vice president; Milton R. Konvitz, secretary-treasurer. Other members are Bridgman, Egon Brunswick, Camap, Feigl, Carl Hempel, the biologist Hudson Hoagland, Roman Jakobson, Quine, Hans Reichenbach, Harlow Shapley, and S. S. Stevens.

The letter itself shows that a series of parallel seminars in the forthcoming meetings would concentrate on a single topic each: for example, linguistics and semantics, communication and cybernetics, science and politics, and science and values. Each of the four different groups would have its own monthly meeting, and seriously work on projects and perhaps on publications.

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As it turned out, the American Academy already had working groups on Science and Politics and on Science and Values, and so the Institute folded those activities in with the Academy's, and on its own ran only the Linguistics and Semantics seminar and the Communications and Cybernetics seminar. Wiener's seminal book on cybernetics was new and difficult to read. The *Dictionary of Scientific Biography* was later not very kind to Wiener's work, calling "...Cybernetics a badly organized work."¹² But the group was eager to hear Wiener tell what it was all about, and he was quite ready to do so.

When Minutes of meetings were not kept or did not survive, one can sometimes get a taste of the discussions from letters. There is one to Henry A. Murray (30 April 1951, from Ralph Burhoe, Secretary of the American Academy) which pleads with him to address the group on the topic, what psychological studies can do for the "clarification of value judgments." At the previous meeting, LeCorbeiller had delivered himself of what the letter called a "bomb blast", saying "it was nonsense for such a group [with so many physical scientists] to discuss the problem of values, since there existed, in the wake of Freud, a special science" that is making progress, in comparison to which all others are "amateurish and utterly inadequate." The letter concludes that while those present had recognized "that it would be desirable to include at least one psychologist, psychiatrist, or psychoanalyst in the group, someone implied that this would be practically futile since this species of human cannot communicate with physical scientists, both because of a lack of a common language and because of basic emotional antipathies." There is no record of how Murray, largely a Jungian, dealt with this challenge.

Among other meetings one would like to have had recorded were those beginning with presentations by Hermann Bondi on the "Continuous Creation Hypothesis" (17 Nov. 1953); by Karl Popper on "Some Reasons for Discarding our Philosophy of Meaning" (10 March 1950, during his stay at Harvard to give the William James Lectures); by John von Neumann (Feb. 28, 1946) on the "Theory of Games and Economic Behavior", followed a month later by Oskar Morgenstern on further applications to economics; by Howard H. Aiken (Jan. 17, 1947) on the first large electromechanical computer, the Mark I, "Automatic Calculating Machinery", with Leontief as moderator; and by Dennis Gabor on "Information Theory and Scientific Method" (9 Oct. 1951). By that time the group's secretaryship had passed on to a young neurophysiologist named Walter Rosenblith. Among the new attendees one finds the name of the prominent electrical engineer Jerome Wiesner, who later became president of MIT, with Rosenblith serving as his Provost.

One topic that interested some members of the group rather intensely was Social Physics. One of my notes records the suggestion: "Get J. Q. Stewart." Professor Stewart was an astronomer at Princeton University, but deeply devoted to his idea of Social Physics, a project to quantify the everyday behavior of people in order to find its descriptive laws--for example, the relation between the distances between two cities and the number of telegrams that went back and forth between them. His book, *Social Physics*, is full of mathematical relationships exploring behavior patterns that might be deduced from national statistics. Somehow he persuaded the

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group, and perhaps above all Bridgman, to spend quite a lot of time on his ideas. For example, there is a sheet (Fig. 8) from the "Fourth Conference on Social Physics", held in Randolph, New Hampshire, a small village where Bridgman had his summer house. With some money from the Rockefeller Foundation a variety of experts were brought together to examine the claims of Stewart. Voluminous Minutes were kept and still exist. The whole topic has the sound and smell of the kind of enthusiasm that occasionally engaged persons such as Neurath in the heyday of the Vienna Circle, a mixture of physics and sociology.

Social Physics tried to apply to the social sciences the teachings of the physical sciences, and attempted to catalogue and describe, in a rather Machian fashion, the stimuli and responses in the social sciences with respect to social values. The crucial factors were "social energies", which could be represented by physical terms. These energies included meaning, feeling, and authority. Social Physicists searched for metaphors or analogies between the physical and social sciences, though there was, quite explicitly, no attempt to set up physics *over* sociology and the humanities.

In retrospect one must say that for a group of academics that essentially invented itself, the conferences, publications, and other activities of the Institute for the Unity of Science--of which I have given by no means an exhaustive account--came to look more and more professional. Take for example the 2 1/2-day-long, ecumenical and elaborate conference on "Validation of Scientific Theories", held in December 1953. It was sponsored by the American Academy, the Institute for the Unity of Science, the Philosophy of Science Association, the American Association for the Advancement of Science, and even "cosponsored" by the National Science Foundation. The speakers and panelists included Frank, C. West Churchman, Henry Margenau, Robert K. Merton, Gustav Bergmann, Carl Hempel, R. B. Lindsay, Bridgman, Adolf Gruenbaum, Else Frenkel-Brunswick, B. F. Skinner, Michael Scriven, Wolfgang Kohler, N. Rashevsky, Warren McCulloch, Henry Guerlac, Alexandre Koyre, Karl Deutsch, Edwin Boring, and Robert S. Cohen, then at Wesleyan University. (Fig. 9 is the "tentative program", circulated to the Program Committee, with its original markings.) The main papers were first published in 1954 and 1955 in several issues of the *Scientific Monthly*, and later in a widely distributed book, edited by Frank (*The Validation of Scientific Theories*. Boston: Beacon Press, 1957).

I hope this survey, based chiefly on some documents in my "archive" of this group, has provided a feeling for one of the transplanted parts of the Vienna Circle, specifically its Boston-area history, its aims, its members, its friends and interested visitors. But by 1955 or so, the group began to disintegrate, mainly for the same reasons that led to the passing of logical positivism and its successor into the shadows. As Lewis A. Coser has written, they were victims of their own success; I think he meant by this that their ideas had become so adapted to local conditions and so widely internalized that they had lost their original energy and relevance. Perhaps equally or more important were the various challenges from Quine and the late works of Wittgenstein, as well as from Alexandre Koyre and Norwood Russell Hanson, each of whom by the end of the 1950s had opened up new ways for thinking about the interaction between science and philosophy. Symbolically also, both

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Bridgman and Frank formally retired from the University in the mid-1950s, so the main driving energy of the Boston group was greatly reduced. And in the intervening decades, the pendulum has swung to the other extreme. Apart from the few centers where logical positivism, logical empiricism, and its successors have become fruitful historical research sites, the denigration of what these serious scholars tried to do is as total as it is usually uninformed. A useful (and amusing) account of the current situation by D. C. Phillips of Stanford University begins as follows:

Nowadays the term "positivist" is widely used as a general term of abuse ... Social scientists who either bandy the term about, or are the recipient of it as an abusive label, are so confused about what it means that, while the word is full of sound and fury, it signifies nothing. The anti-positivistic vigilantes, who realize nothing of this, still claim to see positivists everywhere.¹³

At any rate, the meetings of the I.U.S. continued to 1958; but what was now needed was a rather new effort that would build on the basis of the I.U.S. with youthful energy. And this is precisely what happened. Robert S. Cohen had become Secretary of the group; and after seeing to it that as an organization it was given a decent burial by dissolution—with its remaining small funds transferred to the *Philosophy of Science* journal and the newly formed Philosophy of Science Association—he and his colleague Marx W. Wartofsky founded the inter-university Boston Colloquium for Philosophy of Science in 1959, located at Boston University, and still going vigorously. During its early years, Frank and other former members of the I.U.S. contributed regularly, and thereby smoothed the transition. Indeed, the second volume of the Proceedings of the Boston Colloquium, the series that became internationally known under the title *Boston Studies in the Philosophy of Science*, was a Festschrift dedicated to Frank.¹⁴

I end with a personal remark. As I fully appreciated at the time, for a young person, participating in these activities was immensely stimulating. Perhaps precisely because of the high density of superb intellectuals, the various leading members of the group, brought together by remnants of the Vienna Circle, made no effort to exact any uncomfortable agreements, but relished in the most wide-ranging debates. I never felt that I had to follow, or to struggle against, any doctrinaire master. When my own first historical studies convinced me of the need to add Thematic Analysis to the older tool-kit of the historian and philosopher of science, I sensed only encouragement, instead of the kind of opposition one might have expected from rock-hard logical empiricists. If I had to characterize the members of that group in one sentence, I would focus on their unlimited curiosity and their generosity of spirit, a generosity which seemed founded on their ever-youthful self-confidence. When future historians study the philosophy of science during the middle part of this century, I hope they, too, will remember this.

NOTES

1. For original excerpts from the diary, see Manfred Geier, *Der Wiener Kreis*. Rowohlt: Reinbek bei Hamburg 1992, pp. 49-50.

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2. See G. Holton, "Ernst Mach and the Fortunes of Positivism in America", in *Isis*, \obi. 83, 1992, pp. 27-60, or chapter 1 in G. Holton, *Science and Anti-Science*. Cambridge, MA: Harvard University Press 1993. These are earlier versions of my essay, "From the Vienna Circle to Harvard Square: The Americanization of a European World Conception", in Friedrich Stadler (Ed.), *Scientific Philosophy: Origins and Developments*. Dordrecht/Boston/London: Kluwer Academic Publishers, 1993. The present essay essentially continues the account of those developments into the 1940s and 1950s.
I gladly acknowledge help with documentary research from Myles Jackson and Ha-sok Chang, and excellent comments on an early draft from Robert S. Cohen. Versions of this essay were presented at a lecture at the Institut Wiener Kreis in April 1993, and at the Boston Colloquium for Philosophy and History of Science in December 1993.
3. Mach had first turned to *Privatdozent* Frank in 1910 for help when Mach was puzzled by the new physics. See Holton, *Science and Anti-Science* (Ref. 2), chapter 2.
4. E.g., see R. S. Cohen, "Dialectical Materialism and Carnap's Logical Empiricism", in P. A. Schilpp (Ed.), *The Philosophy of Rudolf Carnap*. LaSalle: Open Court, 1963, pp. 99-158, for remarks on Hans Hahn. In Neurath's work, there was a continual emphasis on placing the social sciences into the framework of Unified Science; this had inherently progressivist political implications for Neurath. See, for example, "Empirical Sociology" in Otto Neurath: *Empiricism and Sociology*, Marie Neurath and Robert S. Cohen (Eds.), Dordrecht: Reidel, 1973, pp. 319-421, and "Sociology in the Framework of Physicalism" in Neurath's *Philosophical Papers 1913-1946*, Robert S. Cohen and Marie Neurath (Eds. and Trans.), Dordrecht: Reidel, 1983, pp. 58-90.
5. Published as P. Frank, "Introductory Remarks", in "Contributions to the Analysis and Synthesis of Knowledge", *Proceedings of the American Academy of Arts and Sciences*, Vol. 80, nr. 1, July 1951, "published in cooperation with the Institute for the Unity of Science", pp. 5-8, on pp. 7-8.
6. The chapters ranged from P. Frank, "The Logical and Sociological Aspects of Science" to Else Frenkel-Brunswick, "Psychoanalysis and the Unity of Science."
7. See Ref. 2
8. Ref. 4, p. 5.
9. *Proceedings*, \obi. 80, nr. 1, July 1951, p. 9.
10. The bibliography was completed in 1951 with the assistance of Bernard Barber, and it was published in May 1952 by the American Academy of Arts and Sciences in its *Proceedings*, Vol. 80, nr. 2.
11. I have placed copies of these, and of many other documents referred to in this account, in the archives of the Institut Wiener Kreis (Vienna) and of Harvard University (Pusey Library, P. Frank file).
12. Hans Freudenthal, entry for Norbert Wiener in C. C. Gillispie (Ed.), *Dictionary of Scientific Biography*, Vol. XIV, 1976. The biography of Wiener by Steve J. Heims, *John Von Neumann and Norbert Wiener: From Mathematics to the Technologies of Life and Death*, Cambridge, MA: MIT Press, 1980, indicates the early struggles of Wiener and of his audience.
13. D. C. Phillips, *The Social Scientist's Bestiary: A Guide to Fabled Threats to, and Defences of, Naturalistic Social Science*. Oxford: Pergamon Press, 1992, chapter 7 ("Positivism"), on p. 95.
14. Robert S. Cohen and Marx W. Wartofsky (Eds.), *In Honor of Philipp Frank*, Vol. 2 of Boston Studies in the Philosophy of Science. New York: Humanities Press, 1965.

Figure 1

1

FIFTH INTERNATIONAL CONGRESS FOR THE UNITY OF SCIENCE

Logic of Science

Harvard University, Sept. 3-9, 1939

Sunday, Sept. 3, 8 PM. Smoker. Eliot House. Opening of the Congress.
 President James B. Conant, F. W. Bridgman, C. Neurath, C. Morris.

Monday, Sept. 4.

Morning, 9-12 AM.

General Session. The Unification of the Sciences

Emerson Hall, Room D.

George Sarton, The Historical Basis of Philosophical Unification.

P. W. Bridgman: The Presuppositions of the Unity of Science

Otto Neurath: The Social Sciences and Unified Science

Afternoon, 2:30-5:30 PM

General Session. Science and Empiricism

Emerson Hall, Room D.

Jørgen Jørgensen, Empiricism and the Unity of Science

Hans Reichenbach: On Learning

Richard von Mises: On a Textbook of Empiricism

Tuesday, Sept. 5.

Morning, 9-12 AM.

General Session: General Aspects of the Unity of Science

Emerson Hall, Room D.

Haskell F. Curry: Remarks on the Definition and Nature of Mathematics

W.F.G. Swann: The Significance of Scientific Theories

Rudolf Carnap: Language and Analysis of Science.

Afternoon, 2:30-5:30 PM.

Concurrent Sessions:

A. Problems in the Unity of Science, Emerson Hall, Room A.

Horace P. Kallen: The Meanings of Unity

Susanne K. Langer: The Scope of Problems as the Limit of Intellectual "Fields".

Herbert Feigl: Unity of Science and Unitary Science

Sidney Hook: John Dewey and Physicalism

B. Physics, Emerson Hall, Room F.

R. B. Lindsay: The Meaning of Measurement in Physics

Louis Rougier: Les nouvelles logiques de la mécanique quantique et l'empirisme radical

F. Weismann: Is Logic Applicable to the Whole of Physics?

Wednesday, Sept. 6.

Morning 9-12 AM.

Concurrent Sessions:

A. Psychology and the System of the Sciences, Emerson Hall, A

Carroll C. Pratt: The Subject Matter of Psychology in Relation to General Science

- F. Oppenheim and K. Grelling: Logical Analysis of "Gestalt" as a Functional Whole.
 Henry S. Leonard: Gestalt Psychology and Physicalism.
 E. Biology and the Social Sciences. Emerson Hall, Room F.
 Kurt Goldstein: The Rationale of Biological Knowledge
 Ralph W. Gerard: Some Social Implications of Biology
 Lawrence J. Henderson: A Relation of Physiology and the Social Sciences

Afternoon.

Exhibit of George Sarton's apparatus for the study of the History of Science
 Widener Library, 185-9 2:30 PM.

Tea 4:30

Thursday, Sept. 7.

Morning, 9-12 AM.

Concurrent Sessions:

- A. The Social and Humanistic Sciences, Emerson Hall, Room A
 William R. Dennes: Value Theory and the Social Sciences
 Louis Wirth: Values in Social Science
 Charles Morris: Semiotic, the Socio-Humanistic Sciences, and the Unity of Science
 Heinrich Gomperz: Unified Science and Value
 E. Observation and the Confirmation of Scientific Theory, Emerson Hall, Room F.
 Carl G. Hempel: The Logical Structure of Empirical Testing
 Alexander Wundheiler: An Attempt at a Formal Methodology of Empirical Systems
 J. Lindenbaum-Hoslasson: On Confirmation

Afternoon, 2:30-5:30 PM.

Concurrent Sessions:

- A. Language and Science, Emerson Hall, Room D
 D. C. Williams: Designation and Empirical Certainty
 Karl Reisch: Syntax of Universal Language
 James F. Senior: The Vernacular of the Laboratory
 Karl Buhler: Four General Assumptions in Theory of Language
 B. Probability, Emerson Hall, Room F.
 Arthur H. Copeland: The Role of Observations in a Formal Theory of Probability
 Sergei Feitelberg: Threshold Perceptions and Probability
 Henry Margenau: Probability and Physical Inquiry
 C. Science and Society, Emerson Hall, Room A.
 Edgar Zilsel: The Social Roots of Science
 Fritz Schreier: Das Problem der Voraussage in Psychologie und Soziologie.
 Leo Byrne: Attainable Gains to Education from the Unity of Science Movement.

Friday, Sept. 8.

Morning, 9-12 AM.

Concurrent Sessions:

- A. Joint meeting with the History of Science Society.
 Historic Attempts at the Encyclopedic Integration of Science
 Emerson Hall, Room D.
 Werner Jaeger: Centralization and Unification of Science in the School of Aristotle

Estelle De Lacy: Leibniz
 George De Santillans: The Encyclopedists
 Talcott Parsons: Comte.

- B. Joint meeting with the Association for Symbolic Logic.
 Problems in the History and Theory of Logic, Emerson, A.
 Karl Dörr: Die mathematische Logik des Arnold Geulincx
 Ernest Nagel: Charles S. Peirce, Pioneer of Modern
 Empiricism
 Alonzo Church: Schröder's Anticipation of the Simple
 Theory of Types
 Barkley Rosser: The Introduction of Quantification
 into a Three-Valued Logic
 S. C. Fleene: On the Term "Analytic" in Logical Syntax.

Afternoon, 2:30-5:30 PM.

Concurrent Sessions:

- A. Method in Psychology and the Social Sciences, Emerson, D.
 S. S. Stevens: On the Problem of Scales for the
 Measurement of Psychological Magnitudes.
 John Somerville: Methodological Factors in the Advance-
 ment of the Social Sciences
 F. Creedy: A Mathematio-logical Theory of Society
 Kurt Lewin and Karl Korsch: Mathematical Constructs
 in Psychology and Sociology.
- B. Science and Nature, Emerson Hall, Room A.
 William F. Fontague: Illusion of Nominalism
 A. C. Benjamin: Some Realistic Implications of Operatio-
 nalism, Constructs, Hypotheses, and Vagueness
 Julius Krafy: Metaphysical or Logical Interpretation
 of Logic?
 W. V. Quine: A Logistical Approach to the Ontological
 Problem.
- C. Papers in the History of Science, Emerson Hall, Room F.
 Tenney L. Davus: The Identity of Chinese and European
 Alchemical Theory
 Hans Kelsen: Die Entstehung des Kausalitätsbegriffs.
 Philipp Frank: The Historical Position of Einstein's
 Theory of Relativity in the Evolution of Science

Saturday, Sept. 9.

Morning, 9-12 AM.

Concurrent Sessions.

- A. Problems in Logic, Emerson Hall, Room A.
 Felix Kaufmann: Truth and Logic.
 Kurt Grelling: A Logical Theory of Dependence
 Leon ~~Skolem~~ Chwistek: Infinitely Small Numbers and
 Their Application.
 Alfred Tarski: ?
- Science and Engineering, Emerson Hall, Room D.
 Robert S. Woodbury: The History of Engineering and the
 Industrial Revolution
 A. V. Parnv: Is Engineering a Branch of Science?
 Nicholas E. Oboukhoff: Empirico-logical and Teleological
 Factors in Engineering
- Closing Session: 12:15-1:00 PM., Emerson Hall, Room D.
 Report of Committees.
 Philipp Frank: Review of the Congress.

Figure 2

INTER-SCIENTIFIC DISCUSSION GROUP

December 30, 1944

Dear Professor Graef:

We wish to thank you for speaking at our last meeting and wish to invite you to join our group and participate in as many meetings as you can.

Our group consists of persons in different fields who feel that the extreme specialization within science demands as its corrective an interest in the entire scientific edifice. We plan to hold meetings from time to time in which discussions of different topics will be led by competent scholars.

The next meeting will be held on Monday, January 3th, at the Harvard Faculty Club at 7:30 P.M. Professor H. von Mises will lead a discussion on "Sense and Nonsense in Modern Statistics." It will be preceded by dinner at the Faculty Club at 6:30 P.M. Kindly notify Dr. Philippe Le Corbeiller, Craft Laboratory, Cambridge, if you can attend the dinner.

Sincerely yours,

The Committee:

Percy W. Bridman
Walter Cannon
Philipp Frank
Philippe LeCorbeiller
Wassily W. Leontief
Harlow Shapley
George Uhlenbeck

Figure 3

PROPOSED PROGRAM (1945)

Logic of Science

Borderline between science and philosophy, if any.

Role of philosophical doctrines (as materialism, idealism, etc.) in science. Is this role the same in physical science. Is this role the same in physical science as in biology and sociology?

Role of hypothesis and theory. Is it the same in physics as in other sciences? What is the connection between general theory and concrete facts?

Role of mathematics, of long chains of reasoning.

Degree of confirmation of an hypothesis. Is there a measure for this degree?

Role of causal laws and statistical laws in physics, biology and sociology.

Do final laws (purposiveness) play a role in any science?

The role of "time" in physics, biology and history.

Semantics and its application in science.

Unity of science.

Psychology

Psychological basis of scientific activity. Why do we believe something?
Degrees of belief.

Role of the observing subject. "Objectivity."

Belief in inductive methods.

Relation of introspection and behaviorism.

Psychology of discovery.

Biographies. Classical types of scientists.

Sociology of Science

Influence of science on society and vice versa.

What do political and religious ideologies have to do with the evolution of scientific theories? What is the influence of the Church, of Marxism, of Nazism?

Under what conditions were great discoveries made?

Teaching of science. General vs. special science.

Contemporary merging of science and technique.

The role of the liberal belief in progress.

Figure 4

Please sign 5th Meeting Feb. , 1945

Oliver J. Sedgwick

Walter Pitts

Raphael Salem

Vito Volterra

Miron Gurwitsch

Edwin Robertson

P. Le Corbeiller

Y. R. Chao

A. Musgrave

J. Kniff (guit)

R. v. Misses

P. W. Bridgman

G. E. Uhlenbeck

E. C. Hamble

MR. B. H. Arens.

Rafael Logunov

Velox Bernabini

Carlo Graf

Alberto Barajas

J. G. Becker-Carter

P. Hipsley

P. M. Goodwin

Genes J. Helton

J. de Santillana

Hans Staeble

Figure 5

Inter-Scientific Discussion Group

Sixth meeting - March 21, 1945

Mr. and Mrs. Richard Arons

Felix Arrighetti

Ernesto Salame (18 Hilliard St. Cambridge)

~~Carl Shipley~~ (Harvard Observatory)

G. Knott

Anthony Stampchi

Lawrence Fine

Muri J. Hutchinson

T. J. Gannon

John T. Edsall

Paul A. Samuelson

Warren Leonard

Josephine Halvander

Arnold Metzger

Gerald Holton

Harlow Shapley

J. H. Humphreys

Henri A. Jordan

George E. Uhlenbeck

Arthur Mesgraves

C. J. Rouse

P. L. Corbelli

Ronald W. P. King

P. W. Bridgman

H. Nevers

I. A. Richards

Donald P. Griffin

A. S. Coalbridge

J. J. Beebe-Carter

W. Pitts

C. B. Chubb

G. de Santis-Claus

Figure 6

INSTITUTE FOR THE UNITY OF SCIENCE

American Academy of Arts and Sciences
28 Newbury Street, Boston 16, Mass.

This Institute is a non-profit corporation which has offices in Ithaca, New York, and Boston, Massachusetts. The charter says "The purposes for which the corporation is formed are to encourage the integration of knowledge by scientific methods, to conduct research in the psychological and sociological backgrounds of science, to compile bibliographies and publish abstracts and other forms of literature with respect to the integration of scientific knowledge, to support the international movement for the unity of science, and to serve as a center for the continuation of the publications of the unity of science movement." The Institute attempts to stimulate the interest in these issues among college students, college faculties, and among the public at large.

The Institute has arranged an essay contest for college students and young college graduates. It is editing the Encyclopedia of Unified Science, published by the University of Chicago Press. It is starting research projects in the fields of semantics, logic of science, and sociology of science. It arranges discussion groups and meetings at several places in the United States.

It is a part of the International Union for the Philosophy of Science. It cooperates with the International Society for Significs (psycholinguistic studies) in Amsterdam and is organizing, together with this Society, an international meeting in Amsterdam. In cooperation with the European societies for the philosophy of science (French, British, Dutch, Swiss, Scandinavian, Belgian, and Italian), this Institute publishes communications in the international journal "Synthese" which is published in Amsterdam and is the central organ of these groups. It can be subscribed to for \$5 a year through this Institute.

The Institute cooperates also with the movement for general education which attempts to integrate the college curriculum and to break down the barriers between the departments. The Institute arranges lectures and courses at different places in the United States.

It is supported by the Rockefeller Foundation and the American Academy of Arts and Sciences. The Institute is administered by the following Board of Trustees:

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Figure 7

Institute for the Unity of Science

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Harvard University

HANS REICHENBACH
University of Calif.
at Los Angeles

HARLOW SHAPLEY
Harvard University

STANLEY S. STEVENS
Harvard University

October 24, 1950

Dear Sir:

The Institute addresses itself to its friends in an effort to gauge the interest in a new project, the formation of small study groups or seminars (in addition to the usual monthly general meetings). Each seminar, in a series of informal monthly (?) meetings, would concentrate on a single topic throughout, for example (A) Linguistics and Semantics, (B) Communication and Cybernetics, (C) Science and Politics, (D) Science and Values. The American Academy of Arts and Sciences, which cooperates with us in this as in our other programs, has already existing committees active in relation to topics (C) and (D), which I am informed would undoubtedly be glad to work with us in seminars in these topics.

The well-remembered success of similar groups in this area has shown that attendance of qualified and interested non-specialists and mature graduate students can be welcomed; thus one of the items (number 4) in the questionnaire enclosed is a request to you for the names of those to whom one or the other of our projected seminars may appeal.

Yours very truly,

The Program Committee

Percy W. Bridgman
Karl W. Deutsch
Philipp Frank
Roman Jakobson
Philippe Le Corbeiller
Frederick Mosteller
Willard V. O. Quine
Harlow Shapley
S. S. Stevens
Richard von Mises
Gerald Holton (Secretary)

Enclosure

Figure 8

FOURTH RANDOLPH, NEW HAMPSHIRE, CONFERENCE

ON SOCIAL PHYSICS

Digest of Conclusions

The conference was held July 6-11 at the Mount Crescent House, as were the three preceding ones in July, 1950-1-2. Expenses were met from the Rockefeller Foundation grant to Princeton University for the study of social physics, directed by Professor John Q. Stewart. Morning and evening sessions were held, while afternoons were left unscheduled for enjoyment of the White Mountain country.

Participants, representing a wide variety of expertness, were Raymond Albright, theologian and church historian, Episcopal Theological School, Cambridge, Mass.; Raymond E. Bassett, sociologist, University of New Hampshire; P. W. Bridgman, physicist, Harvard University; Norman Dodd, banker and economist, New York, N. Y.; Ira M. Freeman, physicist, Rutgers University; Paul A. Furrer, educator, The Hun School; James D. Hamilton, biologist and physicist, Collip Laboratory, University of Western Ontario; Alfred Joenssen, importer, New York, N. Y.; Bernard O. Koopman, mathematician, Columbia University; John C. MacArthur, Colonel U. S. A. (ret.), editor Armed Forces Chemical Journal; Duncan A. MacInnes, physical chemist, Rockefeller Institute (ret.); G. Edward Pendray, public relations counsel, New York, N. Y.; R. Rudenberg, electrical engineer, Harvard University (ret.); T. Shedlovsky, physical chemist, Rockefeller Institute; John Q. Stewart, physicist and astronomer, Princeton University; W. Frank Sutherland, electrical engineer and administrator, Toronto Hydro-Electric System.

While no formal statement of conclusions has been subscribed to by members, substantial agreement on the following points was reached in the discussions:--

Social physics has attained the threshold of a period when more rapid development is foreseen and should be urged. It now presents the framework of an inclusive pattern for description of social phenomena in the large, and for aiding in the formulation of many types of social policies. This pattern is set by two main ideas drawn in large part from physical science, but nonetheless humanistic in structure and application.

Figure 9

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 Harvard University

WILLARD V. O. QUINE
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HANS REICHENBACH
 University of Calif.
 at Los Angeles

HARLOW SHAPLEY
 Harvard University

STANLEY S. STEVENS
 Harvard University

November 10, 1953

Professor Gerald Holton
 Dept. of Physics
 Harvard University
 Cambridge, Massachusetts

Dear Professor Holton:

After having received your letter containing your preference in the choice of topics for the Christmas Conference, I composed a tentative program in cooperation with those members of the committee whom I could contact personally. The following is the proposed program.

Sunday, Dec. 27, 2 p.m. Section I of the AAAAS.

Symposium: Reasons for the Acceptance of Scientific Theories.

Chairman: R. Seeger (National Science Foundation)

Panel Speakers: P. Frank (Harvard) "The Variety of Reasons for the Acceptance of Theories", W. Churchman (Wayne U.) "The Role of Decision in Inductive Inference", E. Moore (Russian Research Center, Harvard) "On the Role of Political Ideologies in the Acceptance of Theories".

The aforementioned meeting takes place in the Hub Room of the Sheraton Plaza Hotel. All following symposia will take place in the American Academy of Arts and Sciences building, 28 Newbury St., Boston.

Monday, Dec. 28, 9:30 - 12:30

Symposium: The Present State of Operationalism.

Chairman: H. Margenau (Yale)

Panel Speakers: G. Bergmann (Iowa) "Interpretations and Misinterpretations of Operationalism", C. Hempel (Yale) "A Logical Appraisal of Operationalism", R. B. Lindsay (Brown) "Operationalism Reassessed".

Invited Discussants: P. W. Bridgman (Harvard), H. Feigl (Minnesota), A. Grunbaum (Lehigh U.), S. S. Stevens (Harvard), R. Seeger (National Science Foundation).

Monday, Dec. 28, 2:00 - 5:00 p.m.

Symposium: Psychoanalysis and Scientific Method.

Chairman: H. Feigl (Minnesota)

Panel Speakers: E. Frenkel-Brunsvik (Berkeley) "The Meaning of Psychoanalytic Concepts and the Confirmation of Psychoanalytic Theories", E.F. Skinner (Harvard) "Critique of Psychoanalytic Concepts and Theories".

Invited Discussants: M. Lean (Brooklyn College), J. Richfield (Cincinnati), M. Scriven (Minnesota).

Tuesday, Dec. 29, 9:30 - 12:30

Symposium: Organism and Machine.

Chairman: G. Wald (Harvard)

Panel Speakers: W. Kohler (Swarthmore) will speak from the philosophical and psychological viewpoint. N. Rashevsky (Chicago) from the viewpoint of mathematical biophysics. W. McCulloch (M.I.T.) " " " " servo-mechanisms. B. Mandelbrot (Sorbonne) "The Mechanism of Natural Language".

Invited Discussants: E. Nagel (Columbia).

Tuesday, Dec. 29, 2:00 - 5:00 p.m.

Symposium: Science as a Social and Historical Phenomenon.

Chairman: G. Holton (Harvard)

Panel Speakers: H. Guerlac (Cornell) "Impact of Social and Political Events of the French Revolution upon the Scientists of that Time", E. Boring (Harvard) "On the Role of the Zeitgeist in the Formulation of Theories and the Problem of Creativity", A. Koyre (Sorbonne) "The Influence of Philosophical Trends on the Formulation of Scientific Theories".

Invited Discussants: A. Kaplan (Los Angeles), K. Deutsch (M.I.T.), R.S. Cohen (Wesleyan, Conn.)
 J. Barber (Barnard). + R.K. Nelson, Columbia

Please write me any suggestions about possible alterations. All members of the committee are regarded as invited discussants for all symposia. If you have no hotel accommodations reserved by the AAAs, please write as early as possible to the chairman of our local committee, Prof. G. Holton, Dept. of Physics, Harvard University, Cambridge, Massachusetts.

With the expression of my best regards,
 Very sincerely yours,

Philipp G. Frank

Philip G. Frank

RGF:aa