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Logic and Methodology, Center Stage*

Anita Burdman Feferman
Solomon Feferman

The first international Congress for Logic, Methodology and Philosophy of Science was held at Stanford University in August of 1960. Occupying the vacuum created by the demise of the Unity of Science movement, it was the culminating event, on an international scale, of a long process of reorganization of communities of the philosophy of science and of logic that took place in the fifteen years following World War II—a process that involved many competing interests and personalities. Alfred Tarski was the pre-eminent winner in that competition, for the organization of the Stanford congress and its many successors to come was stamped with his view of logic and methodology as being at the center of systematic scientific thought.

After the Unity of Science Movement

Emigration, death, politics, and philosophical conflict account for the failure of the Unity of Science movement to maintain its position at the core of the international organization in logic and philosophy of science. The leading figures who were still alive had long since dispersed, mostly to America, as part of the general intellectual and cultural flight from Nazism in Germany and Austria in the 1930s. In the United States, an effort was made to continue the movement through the fifth International Unity of Science Congress at Harvard in 1939 and the sixth, in Chicago, two years later. That meeting, held three months before the United States entered the war against Germany, Italy, and Japan, proved to be the last. Quine's joking characterization of the Harvard congress as "the Vienna Circle in international exile, with some accretions" applied to the Chicago conference, too.

The Vienna Circle had already disintegrated in the mid-1930s after Hans Hahn died and Moritz Schlick was murdered by a deranged student on the steps of the University of Vienna. Otto Neurath, the main energizer and promoter of the Unity of Science movement and a noted socialist, fled to the

* *Alfred Tarski: Life and Logic*, Anita Burdman Feferman & Solomon Feferman, Chapter 10, Cambridge: Cambridge University Press, 2004, © Anita Burdman Feferman & Solomon Feferman, 2004, published by Cambridge University Press, reproduced with permission.

Netherlands when the Austrian fascists came into power. After the Nazi invasion of Holland, Neurath managed to make his way to England but died of a heart attack in 1945.² The mantle of leadership could have passed to Carnap, who had gone to Chicago well before the war. He was the foremost practitioner of the Circle's doctrine of logical positivism, but he was not a dynamic leader. What was needed was someone with Neurath's personality: endlessly enthusiastic and enterprising, with the determination to see his projects into existence. There wasn't any one like him around, at least not in the Unity of Science group.

In addition to the personal losses, the movement in exile in the United States was absorbed in a less programmatic and more diffuse development of the philosophy of science, partly due to critiques of its basic tenets—most trenchantly by Quine—and partly due to new influences. In particular, it had to relate to an American philosophical tradition of empirical philosophy stemming from the pragmatism of Charles Sanders Peirce, William James, and John Dewey that originated in the latter days of the nineteenth century. Though this school of thought also granted empirical science a privileged position in the unfolding of human knowledge, it did not make as sharp a distinction as the logical positivists had done between “meaningful”, directly verifiable statements and “meaningless”, metaphysical statements. Another difference was that the pragmatists did not give the new developments in mathematical logic a central position. The leading postwar representative of the American tradition in the philosophy of science was Dewey's student Ernest Nagel, the John Dewey Professor of Philosophy at Columbia University.

There was also a significant political dimension to the movement's decline, connected with a major change in perspective. In addition to its program of cleansing philosophy of unreason, logical empiricism had also been in the business of social enlightenment, and its leaders, especially Neurath and Carnap, had allied themselves with socialist causes. When the first representatives of the movement came to the United States before the war, they were welcomed to the milieu of leftist intellectuals centered in New York. But after the war (in the view of the scholar George Reisch), “the movement died because its method, values and goals were broadly sympathetic to socialism at a time when America and its colleges and universities were being scrubbed clean of red or pink elements. The apolitical logical empiricism of the 1950s . . . was a new-born child of the cold war.”³ Like many others, Carnap was subject to political pressures during the McCarthyite red-scare period of the 1950s. When Carnap moved to UCLA in 1954, the FBI—which had been investigating Philipp Frank as an alleged promoter of communism in the United States on the basis of an unfounded rumor—began compiling a file on Carnap, too. They found frequent occurrences of his name in issues of the American Communist Party newspaper, the *Daily Worker*, in support of humanitarian and

2. Cf. [Feigl 1969] and [Dahms 1993].

3. [Reisch (n.d.)].

internationalist causes, especially for peace. Carnap may not have been investigated directly, but many of his friends and colleagues were questioned. Earlier, Sidney Hook, another prominent student of Dewey's and a fervent anti-communist, had vehemently warned Carnap against being tagged as a communist sympathizer. On the occasion of Carnap's publicly signing plans for a meeting of the Cultural and Scientific Congress for World Peace, an alleged communist-front organization, Hook wrote Carnap that "anybody who is still a sponsor by the time the party-line begins to sound off at the Congress, will be marked for life as a captive or fellow traveler of the Communist Party."⁴

Whatever the exact balance of forces were that led to the decline of the Unity of Science movement, its exhaustion as such was widely recognized. Seizing the opportunity, Tarski and his colleagues eagerly stepped into the void. The organizational task that they faced at the outset was to bring American and European logicians and philosophers of science together in an umbrella organization that would do for those fields what the Unity of Science movement had done in the interwar period, but now in a way devoted solely to "objective" issues, without subscribing to the comprehensive scientific world view promoted by the movement in the 1930s that had included the rational transformation of society.

Organizational Jockeying⁵

In Western Europe soon after the end of World War II, a number of new societies for logic and philosophy of science came into existence, both as national and as international organizations. Most prominent among the latter was the International Union for the Philosophy of Science (IUPS), founded in 1950 by Ferdinand Gonseth, a mathematician in Zurich. Since the late 1920s Gonseth had been developing an approach to the foundations of mathematics and the philosophy of science in terms of an "open," dialectical philosophy that rejected the possibility of absolute foundations. Despite the handicap of severely impaired eyesight and the burden of teaching elementary courses at his university, he wrote prolifically, expounding his views, and in the 1930s he organized discussion meetings called the "Entretiens de Zürich"; later, with colleagues, he launched a new journal, *Dialectica*. Gonseth became president of the IUPS, which subsumed various societies of logic and philosophy of science that had arisen in Western Europe in the previous years. Though his union was broadly representative in composition, there were complaints that Gonseth ran it in a high-handed way.⁶

Meanwhile, Tarski was generating interest within the Association for Symbolic Logic (ASL) for the formation of a broader international organization

4. Letter of Hook to Carnap, 29 March 1949, reproduced in part by [Reisch (idib.)].

5. Evert W. Beth Archives, Amsterdam; cf. also [van Ulsen 2000].

6. [Pilet 1977], and H. Guggenheimer letter to [Solomon Feferman], 9 September 2001.

for logic and the philosophy of science. Though the association itself was officially international and had many active foreign members, its center of gravity was in the United States and it was largely regarded as being American. In pushing to ally the ASL more broadly, Tarski and his colleagues hoped to put it in a better position to garner financial support for conferences, journals, publications, and other activities. Not surprisingly, Gonseth's group was also in pursuit of the same benefits. At that time, an expected source of funding for both was the United Nations Educational, Scientific, and Cultural Organization. However, UNESCO could not be approached directly; there was a hierarchy under it, branching along two main lines: the International Council of Scientific Unions and the International Council for Philosophy and Humanistic Studies. The Association for Symbolic Logic was already placed under the former through the International Mathematical Union, but that limited the types of conferences and activities it could pursue and did not represent the interests of its membership among the philosophical logicians and philosophers of science.

Gonseth's society *was* included under the philosophical branch of UNESCO, but Gonseth wanted desperately to be allied with the scientific branch; toward this end, in the early 1950s he courted the ASL to join forces in order to take advantage of the logic group's recognized strength and prestige. Tarski's Dutch colleague Evert Beth belonged both to the logic association and to Gonseth's group and was thus a natural go-between. The problem was that he, Tarski, and others in the association were put off by Gonseth's authoritarian way of conducting matters and by his lack of logical rigor. For that reason, Tarski and Beth discouraged the proposed alliance. Gonseth then tried to get his organization into the International Council of Scientific Unions (ICSU) on its own, but—as a result of behind-the-scenes maneuvering by Father Bocheński on behalf of the ASL—that too was quashed. However, the ICSU made a counterproposal: entry would be approved if Gonseth's International Union for the Philosophy of Science would join with the International Union for the History of Science, which was already under its aegis. The historians of science were not at all happy with this proposal; but the decision had already been made higher up, and they were told that they would not continue to receive support from ICSU unless their union joined with the philosophers of science in this way. At the same time, power was wrested from Gonseth as president of his own organization. In 1953 a putsch by Beth and his friends took place: the Dutch logician Arend Heyting was made president; the position of vice-president was taken over by Tarski's friend, the philosopher of physics Jean-Louis Destouches; and Evert Beth assumed the role of secretary.

Tarski vs. Gonseth re Methodology

In 1953, Gonseth gave a lecture at the Colloque International de Logique in Brussels. Tarski attacked him head-on during the discussion period, brutally dismissing his ideas:

I must admit that I do not see, in the exposition of Professor Gonseth, *one single problem* which could be treated and settled by rational methods. When I hear, for instance, that there is an essential difference between mathematics and the natural sciences, my first tendency is to resist this opinion . . . whether it concerns the origin of the disciplines involved, or the methods of inquiry applied in them, or perhaps the methods of organizing and establishing the results obtained; also under what conditions the differences can be called *essential*. Finally, I arrive at the conclusion that as long as these points are not clarified, no serious discussion of the problem is possible.⁷ [emphasis in original]

In response to another participant in the same discussion, Tarski went on to remark:

It would be more than desirable to have concrete examples of scientific theories (from the realm of the natural sciences) organized into deductive systems. Without such examples there is always the danger that the methodological investigation of these theories will, so to speak, hang in the air. Unfortunately, very few examples are known which would meet the standards of the present-day conception of deductive method and would be ripe for methodological investigations; I can refer, however, to some recent attempts in this direction—to the work of J. H. Woodger in the foundations of biology and of J. C. C. McKinsey and his group in the foundations of physics. The development of metamathematics, that is, the methodology of mathematics, would hardly have been possible if various branches of mathematics had not previously been organized into deductive systems.⁸

In other words, a precondition for the methodological study of the sciences would, in Tarski's view, be their presentation as axiomatic deductive systems, and the paradigm for that was the axiomatization of various parts of mathematics and its study by the methods of metamathematics. All of this was directly opposed to Gonseth's anti-foundational, open view of science.

For many years Tarski and Carnap had held the ideal view that the sciences ought to be systematized in axiomatic deductive form. As the philosopher of science Michael Friedman puts it, Carnap—in his famous 1934 work *The Logical Syntax of Language*—had articulated the program of logical analysis as the principal enterprise of philosophy, “simply as a branch of logical syntax: specifically [that] of the language of science.”⁹ But Tarski had not always been as sanguine about its applicability. However, by the time of his criticism of

7. [Tarski 1986a, Vol. 4, p. 715–716].

8. *Ibid.*

9. [Friedman 1999, p. 12].

Gonseth in 1953 he could, at least, point to the work on axiomatization of physics by McKinsey and Suppes and the group around them.

Even so, Tarski remained equivocal about the role of logic in the methodology of the physical and other sciences. In the preface to the proceedings of the 1957 Berkeley conference on the axiomatic method in geometry and physics, he wrote (with his co-editors Henkin and Suppes) that “much foundational work in physics is still of the programmatic sort, and it is possible to maintain that the status of axiomatic investigations in physics is not yet past the preliminary stage of philosophical doubt as to its purpose and usefulness. In spite of such doubts, an increasing effort is being made to apply axiomatic methods in physics.”¹⁰ Tarski was not the only one to speak of mathematical and scientific methodology, and the use of “methodology” as a key word for the kinds of research programs he had in mind does not originate with him; it goes back to the Polish philosopher Kazimierz Ajdukiewicz, though Tarski perhaps construed it in more specific terms along the lines of Carnap’s project for the logical investigation of scientific language and theories as formal objects of study. The word “methodology” has a ponderous sound to some ears, and its intended scope is not clear; but, since it was Tarski who emblazoned it as the emblem on his shield, the recurrence of the word in the organizational activities that he promoted is unavoidable. It had already become part of the name of the interdepartmental program in logic and the methodology of science that Tarski and his colleagues inaugurated at Berkeley in 1957. (In recent years, “methodology” has become a vogue word, often misused as a pretentious substitute for “method” in scientific and technical contexts.)¹¹

A Marriage of Convenience

Following the directive of the International Council of Scientific Unions, in 1955 the international societies of the historians of science and of the philosophers of science joined to create a new entity, the International Union for the History and Philosophy of Science (IUHPS) under the ICSU umbrella. The parties to this marriage of convenience took care to demarcate themselves, respectively, as the Division of History of Science and the Division of Logic, Methodology and Philosophy of Science (DLMPS) within the new union. With the removal of Gonseth, the Association for Symbolic Logic had joined the IUPS the year before and was now represented with significant voting power in the new division for logic and methodology. At the same time, it managed to retain its place under the International Mathematical Union, thus enjoying the best of both worlds.

Between the years 1955 and 1960, the presidential position of the new DLMPS rotated between Alfred Tarski; Jean Piveteau, a paleontologist from

10. [Henkin, Suppes, & Tarski 1959].

11. See the usage note for “methodology” in the *American Heritage Dictionary*, 4th ed., Houghton-Mifflin, Boston, 2000.

the Sorbonne in Paris; Robert Feys, a Belgian philosopher of logic; and Arnold Schmidt, a German logician. Tarski's friends Jean-Louis Destouches and Evert Beth were appointed secretary and treasurer/ adjoint secretary, respectively. Still, Gonseth was not totally out of the picture; over Tarski's objection, Gonseth's backers saw to it that he was given the title of "Honorary President". In 1960 the terms of officers were lengthened to four years each, with Stephen Kleene becoming president for 1960-1963, Kazimierz Ajdukiewicz vice-president, Patrick Suppes secretary-general, and the Dutch mathematician Hans Freudenthal treasurer and adjoint secretary, putting Tarski's people firmly in the saddle. To start things off with a big bang, a major congress was proposed for Stanford in 1960.

The 1960 Congress

A grand idea in breadth and depth, the congress planned for Stanford in 1960 was almost derailed. Patrick Suppes, secretary-general designate of the division and the leading philosopher of science at Stanford, was the point man. In 1959, late in the planning stages, he told Tarski that he was having difficulty raising funds and was under pressure from the National Research Council and the National Science Foundation to abandon the idea of a separate international congress of the division and instead join the historians of science in *their* efforts to organize an international congress at a later date in the United States but not necessarily at Stanford.

Outraged at the proposal, Tarski wrote Suppes:

My reaction to the idea of holding an international congress jointly with the historians of science is decidedly negative . . . A congress for the whole IUHPS [International Union for the History and Philosophy of Science] would be a gathering of people with very few common scientific interests uniting for some administrative, and not scientific, reasons. In particular, logicians would be engulfed in a sea of men who have entirely different approaches in their research and who apply entirely different methods, and I do not see what logicians could gain by participating in such a congress.¹²

Tarski wanted to stick with the Stanford plans for territorial reasons, too. "The work of our group in the San Francisco Bay Area [will give] a guarantee of a high scientific level for the proposed congress . . . [and] if we join the historians of science in their efforts, the common congress will be held somewhere in the East." (Long gone was Tarski's feeling that the West Coast was intellectually inferior.)

Tarski prevailed in his opposition to a joint meeting, and the National Science Foundation, along with the American Council Learned Societies, was

12. Tarski letter to Patrick Suppes, October 1959; Tarski Archives.

persuaded at the last minute to help fund the 1960 congress at Stanford. Ironically, in the end, no financial support for this or succeeding meetings of the division was obtained from UNESCO, but its titular support gave the organization the desired international status.

The breadth of the congress was assured by the composition of the organizing committee, which was headed by Ernest Nagel as chairman and Alfred Tarski as vice-chairman and included leading scholars from biology, economics, logic, mathematics, philosophy, physics, and statistics. The plans for the meeting were ambitious in their scope and set a pattern that has largely been followed in succeeding congresses of the DLMPS. Invited lectures and contributed papers were distributed through eleven sections, the first three of which were designated for Mathematical Logic, Foundations of Mathematical Theories, and Philosophy of Logic and Mathematics. The next two were entitled: General Problems of Methodology and Philosophy of Science; and Foundations of Probability and Induction. Following that were four sections on the Methodology and Philosophy of Biological and Psychological Sciences, Social Sciences, Linguistics, and Historical Sciences. The final section was labeled History of Logic, Methodology and Philosophy of Science.¹³

Despite the wide scope, more than a third of the invited lectures were in the first three sections. Thus the “Logic” of “Logic, Methodology and Philosophy of Science” was placed front and center—in contrast to the prewar Unity of Science meetings, where it had a secondary position. The first three sections of the Stanford congress had among its invited speakers, such notables as Stephen Kleene, Abraham Robinson, Paul Bernays, Alonzo Church, Arend Heyting, Georg Kreisel, and Tarski himself, as well as a number of Tarski’s students and co-workers. But while logic now took pride of place, methodology and philosophy of science commanded the major portion of the program. As in the Unity of Science meetings from 1935 to 1941, this was construed broadly to include the physical, biological, and social sciences.¹⁴ Leaders in the latter field among the invited speakers were the economists John Harsanyi and Leonid Hurwicz, the psychologist Ernest Hilgard, the social scientist Paul Lazarsfeld, and the linguist Noam Chomsky. Other distinguished participants were the philosophers Karl Popper and Rudolf Carnap and the physicists Henry Margenau and John Wheeler. Berkeley and Stanford were well represented, as Tarski foresaw, yet the meeting was by no means insular; participants came from all over the world, including several from countries behind the Iron Curtain.

The list of speakers and disciplines generated palpable excitement; new personal contacts were made and new interdisciplinary sparks generated. These were enhanced by the many dinners and parties that were arranged informally as well as by several group excursions that were organized for the weekend.

13. The full program is to be found in [Nagel, Suppes, & Tarski 1962].

14. The programs of the Unity of Science meetings 1935-1941 are given in full in [Stadler 1997, p. 406–436].

“This country is so beautiful”

It was remarked that, at every opportunity during the Stanford congress, the Soviets and others from communist countries jumped into any group posed for a photograph and threw their arms around the most prominent Americans present. The “opportunists” explained quite frankly that they feared they were on a “hit list” back home and hoped that such evidence could be used as a form of protection to show that they were known in the West; Józef Bocheński was sure he was “number ten” in Poland.¹⁵ Another concern for participants from Iron Curtain countries was that the U.S. State Department had set a limit of a fifty-mile radius from San Francisco beyond which they were not allowed to go. (This was a tit-for-tat response to similar restrictions on the movement of Westerners in the Soviet Union.) A special tour to the Monterey Peninsula had been planned for one of the free days of the congress, including stops at the old Carmel Mission and Point Lobos State Park on the Pacific Ocean. Since the farthest point to be reached was nearly a hundred miles south of Stanford, special permission was obtained to extend the allowed radius temporarily. Two tour buses were hired and filled to capacity. At Point Lobos, with its spectacular scenery of craggy cliffs covered by windswept monterey pines and twisted cypress, paths are well-marked and there are strict warnings not to wander beyond their limits. But at the most famous Cypress Point, the excited scholar-tourists broke the rules and scrambled all over to see the view and take photos. When it was time to regroup and get on the buses for the return to Stanford, all the Russians were missing. After a long wait, ad hoc search parties and a ranger were sent out to scour the various paths and call out for them, to no avail. Now the tour leaders began to worry: Could one or more of the Russians have hidden so as to escape those of their company suspected to be KGB agents, or were they themselves agents? Worse yet, could one of them have fallen off the edge of a cliff to injury or death? Finally, after an interminable wait, one by one the Russians appeared as if out of nowhere, with hardly a word of explanation or apology except to say: “It’s your fault! This country is so beautiful, we could not resist taking one photograph after another and it was impossible to stop.”

After 1960, the LMPS congresses continued to meet every four years, with an occasional exception. They were held in Jerusalem, Amsterdam, Bucharest, London (Ontario), Hanover, Salzburg, Moscow, Uppsala, Florence, and Cracow. In August 2003, the first congress of the twenty-first century took place in Oviedo, Spain. Tarski’s stamp on the organization and its meetings is indelible, and even during his lifetime he was gratified with the success of his vision.

15. Nino Cocchiarella interview with [Anita Burdman Feferman] and [Solomon Feferman], April 2000.

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