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Aufbau/Bauhaus: Logical Positivism and Architectural Modernism

Peter Galison

1. Introduction

On 15 October 1929, Rudolf Carnap, a leading member of the recently founded Vienna Circle, came to lecture at the Bauhaus in Dessau, southwest of Berlin. Carnap had just finished his magnum opus, *The Logical Construction of the World*, a book that immediately became the bible of the new antiphilosophy announced by the logical positivists. From a small group in Vienna, the movement soon expanded to include an international following, and in the sixty years since has exerted a powerful sway over the conduct of the philosophy of science as well as over wide branches of philosophy, economics, psychology, and physics.

I would like to thank Nancy Cartwright, Robert S. Cohen, Richard Creath, Lorraine Daston, Arnold Davidson, Alain Findeli, Peter Frank, Caroline Jones, J. B. Kennedy, Cheryce Kramer, Timothy Lenoir, and Hans Sluga for many helpful conversations. My thanks as well to the Archives of Scientific Philosophy in the University of Pittsburgh Libraries (especially to Gerald Heverly); to the Peirce Edition Project at the Center for American Studies (especially to Janine Beckley and Christian Kloesel); to the Special Collections at the University of Chicago Library; to the University Library Special Collections Department, The University of Illinois at Chicago (especially to Mary Ann Bamberger); to the Bauhaus-Archiv, Museum für Gestaltung (especially to Frau Stolle and Dr. Magdalena Droste); to the Archives of the History of Art, Getty Center for the History of Art and the Humanities, Los Angeles (especially to Stephen Nonack); and to the Vienna Circle Archive, Vienna Circle Foundation (Amsterdam) (especially to Anne Kox) for their help and permission to cite material held at these locations. This work was completed with the support of the Center for Advanced Study in the Behavioral Sciences and the National Science Foundation.

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The site of Carnap's lecture that day, the Dessau Bauhaus, was a stunning building designed by Walter Gropius and dedicated just three years earlier. Protected by its flat roof and glass walls, the artists, architects, weavers, and furniture designers had made the school a citadel of high modernism. It was here that Carnap addressed an enthusiastic audience on "Science and Life." "I work in science," he began, "and you in visible forms; the two are only different sides of a single life."¹ In this paper I will explore this "single life" of which the new philosophy and the new art were to be different facets; in the process, I hope to cast light on the shared modernist impulses that drove both disciplines in the interwar years.

Any attempt to link philosophy and art in the interwar period must go further than merely identifying parallelisms between movements. In fact, core members of the logical positivist and Bauhaus groups self-consciously sought to articulate a view of the world in which both would play essential roles. Though on opposite political poles of the Vienna Circle, the philosophers Otto Neurath and Ludwig Wittgenstein each spent years pursuing architectural concerns. Throughout their writings Carnap, Neurath, and others singled out modern architecture as the cultural movement with which they most identified; their interests were reciprocated as the logical positivists were more prominent as visitors to the Dessau Bauhaus than members of any other single group outside art and architecture. Further, the two movements faced the same enemies—the religious right, nationalist, anthroposophist, *völkisch*, and Nazi opponents—and this drove them even closer together, toward the conjoint life they had in mind. Both enterprises sought to instantiate a modernism emphasizing what I will call "transparent construction," a manifest building up from simple elements to all higher forms that would, by virtue of the systematic constructional program itself, guarantee the exclusion of the decorative, mystical, or metaphysical. There

1. Rudolf Carnap, lecture notes for his Bauhaus lecture, "Wissenschaft und Leben," prepared 1 Oct. 1929 and delivered 15 Oct. 1929, transcription from shorthand by Gerald Heverly, Carnap Papers in the Archives of Scientific Philosophy, University of Pittsburgh Libraries, University of Pittsburgh (hereafter abbreviated CP, PASP), document RC 110-07-49. Quoted by permission of the University of Pittsburgh. All rights reserved. Translations are my own unless otherwise noted.

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was a political dimension to this form of construction: by basing it on simple, accessible units, they hoped to banish incorporation of nationalist or historical features.

From simple observation reports (“protocol statements”) and logical connectives (such as “if/then,” “or,” “and”), the logical positivists sought to ground a “scientific,” antiphilosophical philosophy that would set all reliable knowledge on strong foundations and isolate it from the unreliable. Since all valid inferences would be built out of these basic statements, the sciences would be unified by their shared starting points. For their part, the Bauhäusler hoped to use scientific principles to combine primitive color relations and basic geometrical forms to eliminate the decorative and create a new antiaesthetic aesthetic that would prize functionality. So close had the two groups come in their shared vision of modernism that, when the Bauhaus reconvened as the New Bauhaus in Chicago after fleeing the Nazis, the New Bauhaus imported the Vienna Circle’s logical positivism as a fundamental component of its basic design program.

The modernism of the Bauhaus spanned many styles, political orientations, leaders, and artists—from their almost expressionist pre-World War I efforts in Weimar to the Marxist and technical orientation of the Dessau years. Similarly, as the logical positivism movement spread, it gained strength by enlisting the cooperation of a myriad of philosophical groupings, from American pragmatists to Polish logicians.² By the late 1940s and early 1950s, the impact of both tendencies was vast, but diluted. Here I focus on the late 1920s and early 1930s, a time when the Vienna Circle had just begun its most vigorous and productive phase, and the Bauhaus had recently planted its new roots in Dessau. During this period the connecting links between art and philosophy were real, not metaphorical, as artists and philosophers were bound by shared political, scientific, and programmatic concerns. No doubt by casting a wider net one could find other “affinities” between bits of philosophy and morsels of modern art, music, and literature. But it is in the later interwar period that the modernism of the Bauhaus and the Vienna Circle self-consciously reinforced each other, and in so doing began to articulate a common vision of what both called a modern “form of life.”

2. Their polemic included a story of the group’s origin in their manifesto, and this story has been repeated in “histories” that have been written (mostly by adherents to the movement) ever since. The standard sources for these recollections/histories are: A. J. Ayer, “The Vienna Circle,” in Ayer et al., *The Revolution in Philosophy* (London, 1956), pp. 70–87; Carnap, “Intellectual Autobiography,” *The Philosophy of Rudolf Carnap*, ed. Paul Arthur Schilpp (La Salle, Ill., 1963), pp. 3–84; Joergen Joergensen, “The Development of Logical Empiricism,” in *Foundations of the Unity of Science: Toward an International Encyclopedia of Unified Science*, ed. Otto Neurath, Carnap, and Charles Morris, 2 vols. (Chicago, 1970–71), 2:847–946; Victor Kraft, *The Vienna Circle: The Origin of Neo-Positivism, A Chap-*

A reconstruction of this modernist form of life would serve two purposes. First, it would afford us a wider cultural understanding of both the philosophical and architectural movements. In particular, it could give a deeper significance to the attempt by philosophers of science to construct a “modern” view of the world. My hope is that by tracing the real links between the Vienna Circle and the Bauhaus, light will be shed on a central strand of canonical high modernism, revealing how each discipline used the other to legitimate its then radical endeavor.³ Second, it is by now clear that both logical positivism and modernist architecture have come to occupy a central and disputed territory between left and right in the rich discussions of postmodernism. Though it is not my primary task here, it may be that by locating the philosophers of the Vienna Circle within a modernist cultural matrix, we will be better able to see what is and what is not an alternative to their political and philosophical vision.

2. *Aufbau and Bauhaus*

To an astonishing degree, modern philosophy of science traces its heritage to the Vienna Circle, a small philosophical group comprised

ter in the History of Recent Philosophy, trans. Arthur Pap (New York, 1953); Hans Reichenbach, *The Rise of Scientific Philosophy* (Berkeley and Los Angeles, 1951); Herbert Feigl, “The Wiener Kreis in America,” in *The Intellectual Migration: Europe and America, 1930–1960*, ed. Donald Fleming and Bernard Bailyn (Cambridge, Mass., 1969), pp. 630–73; John Passmore, “Logical Positivism,” in *The Encyclopedia of Philosophy*, ed. Paul Edwards, 8 vols. (New York, 1967), 5:52–57; Philipp Frank, *Modern Science and Its Philosophy* (1949; New York, 1955); and Neurath, *Le Développement du Cercle de Vienne et l’avenir de l’empirisme logique*, trans. du générale Vouillemin (Paris, 1935). These histories essentially provide a list of names, an intellectual constellation that in the receptive environment of liberal Vienna gelled into a commitment to science and to positivism. The list draws from all of history: in classical antiquity the Epicureans are seen as precursors, in the Middle Ages the nominalists, and in more recent times in Vienna the work of Ludwig Boltzmann and Ernst Mach. Their chosen forebears include Francis Bacon, Thomas Hobbes, John Locke, David Hume, Jeremy Bentham, John Stuart Mill, Herbert Spencer, René Descartes, Auguste Comte, Jules-Henri Poincaré, Gottfried Wilhelm Leibniz, and many others. Above all, the group autobiography continues, it was the recent work of the logicians Bertrand Russell, Gottlob Frege, and Ludwig Wittgenstein that, when mixed with the indigenous positivist tradition of Vienna, was to create logical positivism.

3. In the last decade or so there have been a number of fine studies of the cultural setting of the Vienna Circle. See, for example, Elisabeth Nemeth, *Otto Neurath und der Wiener Kreis: Revolutionäre Wissenschaftlichkeit als Anspruch* (Frankfurt and New York, 1981); Friedrich Stadler, “Aspekte des gesellschaftlichen Hintergrunds und Standorts des Wiener Kreises am Beispiel der Universität Wien,” in *Wittgenstein, der Wiener Kreis und der kritische Rationalismus*, ed. Hal Berghel, Adolf Hübner, and Eckehart Köhler (Vienna, 1979), pp. 41–59; and Rudolf Haller, “New Light on the Vienna Circle,” *The Monist* 65

mostly of outsiders to philosophy that met regularly during the 1920s. Moritz Schlick, the Austrian aristocrat who stood at the center of the group known initially as the Verein Ernst Mach, had done his doctoral thesis in theoretical optics under the guidance of the physicist Max Planck in Berlin. Other members included Hans Hahn, a mathematician, and Philipp Frank, a theoretical physicist. Neurath was a dynamic, politically committed sociologist who came to the group with an interest in everything from museums to history, philosophy, and physics. Carnap had pursued experimental physics before turning to philosophy; he joined the rest of the Circle in 1926 after being in contact with both Schlick and Neurath. Others came from history, engineering, science, and philosophy. The group rapidly augmented its influence beyond Austrian borders by allying itself with Hans Reichenbach's movement for "Exact Philosophy" in Berlin and similarly oriented efforts in Poland, the United States, Great Britain, and Scandinavia. Throughout its existence, the Vienna Circle conceived of itself as modern and scientific, as a movement that would tear apart the stagnant, pointless inquiry that called itself philosophy. In the place of traditional philosophy the Circle wanted to erect a unified structure of science in which all knowledge—from quantum mechanics to Marxist sociology and Freudian psychology—would be built up from logical strings of basic experiential propositions.

Neurath and Carnap together forged many of the Vienna Circle's most self-consciously modern texts. The first surviving letter from Neurath to Carnap is dated October 1923. Neurath, addressing Carnap as "sehr geehrter Herr Doktor," wrote in the hopes of meeting Carnap to discuss their common interest in the correspondence between concrete reality and mathematical logic. "War and revolution," he said, "have torn chasms that have not yet healed, and it will require some more time before the ease, so necessary for wisdom . . . can be fully regained." Neurath was in a position to know. He had served as a technical expert in the finances of the left-wing revolutionary Munich government; after its defeat he spent a year and a half behind bars. "But," he now wrote Carnap, "I want with this letter to begin to weave a band; my wife and I would be delighted if you could participate in this knotting. Who knows, it might become a real carpet!" Extending a

(Jan. 1982): 25–37. Relatively little exists on Neurath's efforts in the visual arts. The following items are extremely helpful: Robin Kinross, "Otto Neurath et la communication visuelle," in *Le Cercle de Vienne: doctrines et controverses*, ed. Jan Sebestik and Antonia Soulez (Paris, 1986), pp. 271–88; Paul Neurath, "Souvenirs des débuts des statistiques illustrées et de l'isotype," in *Le Cercle de Vienne*, pp. 289–97; and *Arbeiterbildung in der Zwischenkriegszeit Otto Neurath—Gerd Arntz*, ed. Stadler (Vienna and Munich, 1982).

hand to Carnap's "neighboring" *Freideutschen*, Neurath added that they too could participate in the reconciliation.⁴

The letter is revealing not only about Neurath but also about the circle of philosophers he would soon join. Above all, it illustrates the manner in which formal, mathematical philosophy could serve as a bridge over a political divide, with Neurath and Carnap on the left and other members of the Circle on the right. During the revolution Neurath clearly allied himself with the workers' cause, but always in his capacity as a neutral, scientific expert. Even when reporting to the Munich Workers' Council in January 1919, Neurath introduced his summary by reminding the audience that the considerations he would discuss regarding social configurations, shelter, food, clothing, and working time were "unpolitical." Elsewhere that same year he described the social engineer as the direct analogue of the mechanical engineer: both transformed the world through scientific work, through the systematic analysis of modern statistics.⁵ Evidently his stance of neutral engineering appealed to those in charge, for shortly after Kurt Eisner (minister-president of the Bavarian revolutionary government) was killed in February 1919, Neurath was asked to be president of the central planning office for Bavaria. "I accepted," he recounted a few months later, "stressing that I wished to be an unpolitical administrator" (*ES*, p. 21).

Neurath's scientism—his faith in the neutral, binding threads of statistics, physics, and logic—was key to the consolidation of the Verein Ernst Mach. But even as the Verein was in its infancy, Neurath continued his "unpolitical" technical social work and revealed a deep interest in workers' housing, art, and architecture. For Neurath, mass accommodation had several important political functions: it met the immediate material needs of the workers; it encouraged a collective form of life; and it served to build, sector by sector, Neurath's ultimate goal of full socialization of the economy. By the early 1920s Neurath had become a central figure in the housing movements in and around Vienna, drawing him into the circle of politically engaged modern artists and architects.⁶ To Franz Roh, an art critic and close friend, Neurath wrote in 1924: "Just now I am dictating letters about the re-

4. Neurath to Carnap, 19 Oct. 1923, CP, PASP, document 029-16-07, p. 2. Originals of this and all letters by Neurath cited in this article are held by the Vienna Circle Archive, Vienna Circle Foundation (Amsterdam).

5. Neurath, *Empiricism and Sociology*, trans. Paul Foulkes and Marie Neurath, ed. Marie Neurath and Robert S. Cohen (Dordrecht and Boston, 1973), pp. 151–52; hereafter abbreviated *ES*.

6. For an excellent overview of Neurath's involvement in the housing movement, see Robert Hoffmann, "Proletarisches Siedeln—Otto Neuraths Engagement für die Wiener Siedlungsbewegung und den Gildensozialismus von 1920 bis 1925," in *Arbeiterbildung in der Zwischenkriegszeit*, pp. 140–48.

design of workers' housing through propaganda . . . 25,000 apartments were just built. . . . Can you send me information about graphics, color lithography, pictures, etc. concerning such worker housing?"⁷

Beginning at just this time in Germany and Austria, such public mass accommodations were increasingly identified both with Gropius's Bauhaus and with the liberal and left-wing municipal governments that supported the huge building projects.⁸ At the time Neurath wrote to Roh, Gropius himself had just spoken in Vienna, leaving Neurath dissatisfied. But while he complained that Gropius had failed to bring sufficiently new ideas to Vienna, Neurath nonetheless told Roh of his outrage at attempts to abolish the Bauhaus on political grounds.⁹

Neurath's concern was not misplaced: nationalists blasted Gropius's Weimar Bauhaus for its left-wing orientation. Not long after Neurath heard Gropius lecture in Vienna, negotiations between the Bauhaus and the Weimar government collapsed, and in 1925 the socialist government of Dessau successfully courted the displaced artists. But turmoil continued to surround the Bauhaus, inside as well as outside its walls. Neurath's suspicion of some of the more conservative—that is, mystical and mythical—components of the Weimar Bauhaus program were shared by some of the artists within the Bauhaus itself. With the move to Dessau and pressure from various sides, including the spartan geometrists of the De Stijl, the Bauhäusler began a profound shift away from the mystical and toward the streamlined and industrial. This change was surely reinforced by the presence in Dessau of the big industrial concerns of Agfa, the Junkers aircraft plant, and factories for the production of gas and chemicals. Reflecting the new priorities, the teaching staff of the Dessau Bauhaus altered their titles from "masters" to "professors," and replaced graphic design with advertising. Their espousal of everything technical and scientific became ever more pronounced; art would act like science and serve as an initiator in the cycle of industrial production.¹⁰

Nothing pleased Neurath more than this new, scientific turn. When the Dessau Bauhaus opened in December 1926, Neurath was there, and he wrote about the occasion in the journal *Der Aufbau*. Cele-

7. Neurath to Franz Roh, n.d. [probably 1924], Correspondence and Miscellaneous Papers of Franz Roh, Archives of the History of Art, Getty Center for the History of Art and the Humanities, Los Angeles; hereafter designated as Roh Collection.

8. On the role of mass housing as a vehicle for the display of radical architecture, see Barbara Miller Lane, *Architecture and Politics in Germany, 1918–1945*, rev. ed. (1968; Cambridge, Mass., 1985), pp. 58, 84ff; hereafter abbreviated AP. According to Lane, it was the Bauhäusler's involvement in the design of these *Siedlungen* that so politicized the movement of left-wing architecture.

9. See Neurath to Roh, n.d. [probably 1924], Roh Collection.

10. Gillian Naylor, *The Bauhaus Reassessed: Sources and Design Theory* (New York, 1985), pp. 124–28; hereafter abbreviated BR.

brating the renunciation of ornamentation and decoration of every sort, he gently chided the Bauhaus for relying too much on the *style* of modernism and not sufficiently on its practical implications: “When will the modern engineers run the Bauhaus?” Insofar as the Bauhaus followed a technical, socially driven agenda, Neurath believed, it would serve the great revolution associated with the new form of societal and personal life [*Neugestaltung des gesellschaftlichen und persönlichen Lebens*]. Since he believed that “artists were leading the battle for a spiritual liberation from the past,” the Bauhaus’s cultural role could not have been greater.¹¹ This, in the end, was for Neurath the real import of the Bauhaus. Anyone wanting to “enter the promised land” liberated from the past “will seize upon the formation of the new form of life [*Gestaltung des Lebens*] as a technical achievement. This is the thrust of the Bauhaus, unfettering the liveliest discussion, and most vigorous efforts on all sides” (“NB,” p. 211).

In his focus on a technically grounded new form of life, Neurath’s language was at one with that of the radical architects and their defenders, who never tired of insisting that architectural novelty would underwrite a broader reformation of social and political existence. This was the true import of their new mode of building. The idea also permeated Neurath’s writing and was stated most clearly in his 1928 book *Lebensgestaltung und Klassenkampf* [*Form of Life and Class Struggle*], where the philosopher insisted that it was the architect “more than any other creative person” who could anticipate and so shape the future form of life [*Lebensform*] (*ES*, p. 257).¹² Since rationality and scientificity were to characterize the revolutionary proletariat orientation, the architecture of modernity demanded rationality and functionalism. Modern architecture, Neurath believed, could both reflect and shape “the spirit of modern times.” Again and again, he argued that “significant movements of the age” striving to shake loose of the past would ignore the example of the Bauhaus only at their peril. On his mind must surely have been his own less well known but equally messianic defense of the Vienna Circle (“NB,” p. 211).

The notion that technical innovation could alter the form of life lay deep in the political ideology of left-liberal modernism, especially in architecture. In a remark of 1923 that was typical of his arguments ever since the end of the war, Gropius contended that the new modern architecture would actually produce “‘a complete spiritual revolution in the individual’” and a “‘new style of life’” (*AP*, p. 67). Defending the

11. Neurath, “Das Neue Bauhaus in Dessau,” *Der Aufbau* [Vienna] 1, no. 11/12 (1926): 210–11; hereafter abbreviated “NB.”

12. See also the German version of Neurath’s *Lebensgestaltung und Klassenkampf*, *Gesammelte philosophische und methodologische Schriften*, ed. Haller and Heiner Rutte, 2 vols. (Vienna, 1981), 1:235–36.

new architecture, the mayor of Frankfurt am Main, Ludwig Landmann, insisted that “‘our new era must create new forms for both its inner and its outer life’” (*AP*, p. 90). Indeed, the claims for a reformation of life based on modern principles of science became a common slogan of the left-leaning architects in post-World War I Germany—and an irritant to those on the right, who were determined to preserve a *völkisch* life form, imbued with history, nationalism, and racial identity.

Gropius himself began to speak with growing conviction about the science of art as well as architecture: “The Bauhaus workshops are essentially laboratories in which prototypes suitable for mass production and typical of their time are developed with care and constantly improved.”

Only by constant contact with advanced technology, with the diversity of new materials and with new methods of construction, is the creative individual able to bring objects into a vital relationship with the past, and to develop from that a new attitude to design, namely:

Determined acceptance of the living environment of machines and vehicles.¹³

Most important, Gropius created a new architecture department under the direction of Hannes Meyer, who, while continuing the scientific orientation of the earlier Dessau Bauhaus, to the dismay of some of his colleagues, put his materialism up front.

“Building is not an aesthetic process. . . . Architecture which ‘continues a tradition’ is historicist . . . the new house is . . . a product of industry and as such is the work of specialists: economists, statisticians, hygienicists, climatologists, experts in . . . norms, heating techniques . . . the architect? He was an artist and is becoming a specialist in organization . . . building is only organization: social, technical, economic, mental organization.” [*B*, p. 180]

Here was a man after Neurath’s own heart; at last there was a powerful Bauhäusler who put engineering before aesthetics. Instead of the backward-looking “historical” buildings, Meyer wanted the standardized, worker-oriented housing project. With Gropius, Meyer actually built such mass housing in the Törten district of Dessau (1926–28).¹⁴

Typical of Meyer’s technocratic ambitions were his and Hans

13. Gropius, “Dessau Bauhaus—principles of Bauhaus production,” sheet published by the Bauhaus in March 1926; cited in Frank Whitford, *Bauhaus* (London, 1984), p. 206; hereafter abbreviated *B*.

14. See *BR*, pp. 138–42.

Wittwer's 1927 plan for the League of Nations Palace in Geneva. As their entry to the design contest, the two Swiss architects submitted the drawing shown in figure 1. They built up the building from geometrical cells, importing all of the latest technological innovations: paternosters, escalators, express elevators, moving sidewalks, and automobile access. A new world order could not possibly be "squashed into a structure of traditional construction; [there could be] no column-stuffed reception room for tired sovereigns; instead, hygienic work spaces for active representatives. No labyrinthine corridors for the labyrinthine intrigues of the diplomats; instead, open glass rooms for the public affairs of open men. The constructional arrangements of the League of Nations arise through goal-directed *invention* [Erfindung] and not through stylistic composition."¹⁵ Architecture, Meyer believed, would help reconstitute international relations by reorganizing the material world in which they were conducted, just as new mass housing would reform working-class forms of life.

Meyer's radical shift toward the rational and scientific antagonized even some who were broadly sympathetic to that turn in art and architecture, such as László Moholy-Nagy, who had headed the Bauhaus's metal workshop. In January 1928 Gropius quit, and despite the resignation of Moholy-Nagy and the resistance of others, Meyer took over and led architecture to center stage. One of his first moves was to invite guest lecturers in sociology, physics, and philosophy to the Bauhaus to set the tone of scientific progressivism.¹⁶

Meyer's fascination with the scientific and the technical led him to invite Herbert Feigl, a founding member of the Vienna Circle, to the Bauhaus as the official representative of what the Circle called their "new scientific world conception." Feigl spent a week (3–10 July 1929) lecturing and getting to know Wassily Kandinsky, Paul Klee, and others.¹⁷ Apparently his visit was a smashing success, as a few weeks later Carnap wrote to Neurath: "just received a very friendly letter from Hannes Meyer. I'm to come for a week to lecture at the Bauhaus on the scientific world conception. Feigl's efforts seem not yet to have sated them, rather only to have agreeably whetted their appetite. In principle I've said I'll go."¹⁸ Meanwhile the Bauhaus asked Reichenbach to come lecture at Dessau; Reichenbach was the chief Berlin ally of the

15. *Hannes Meyer 1889–1954, architekt urbanist lehrer* (Berlin, 1989), p. 105; hereafter abbreviated *HM*.

16. An excellent collection of Meyer's views can be found in Meyer, *Bauen und Gesellschaft: Schriften, Briefe, Projekte* (Dresden, 1980).

17. Feigl to Reichenbach, 1 July 1929, Hans Reichenbach Papers, PASP, document HR 014-06-11.

18. Carnap to Neurath, 25 Aug. 1929, CP, PASP, document 029-15-02.

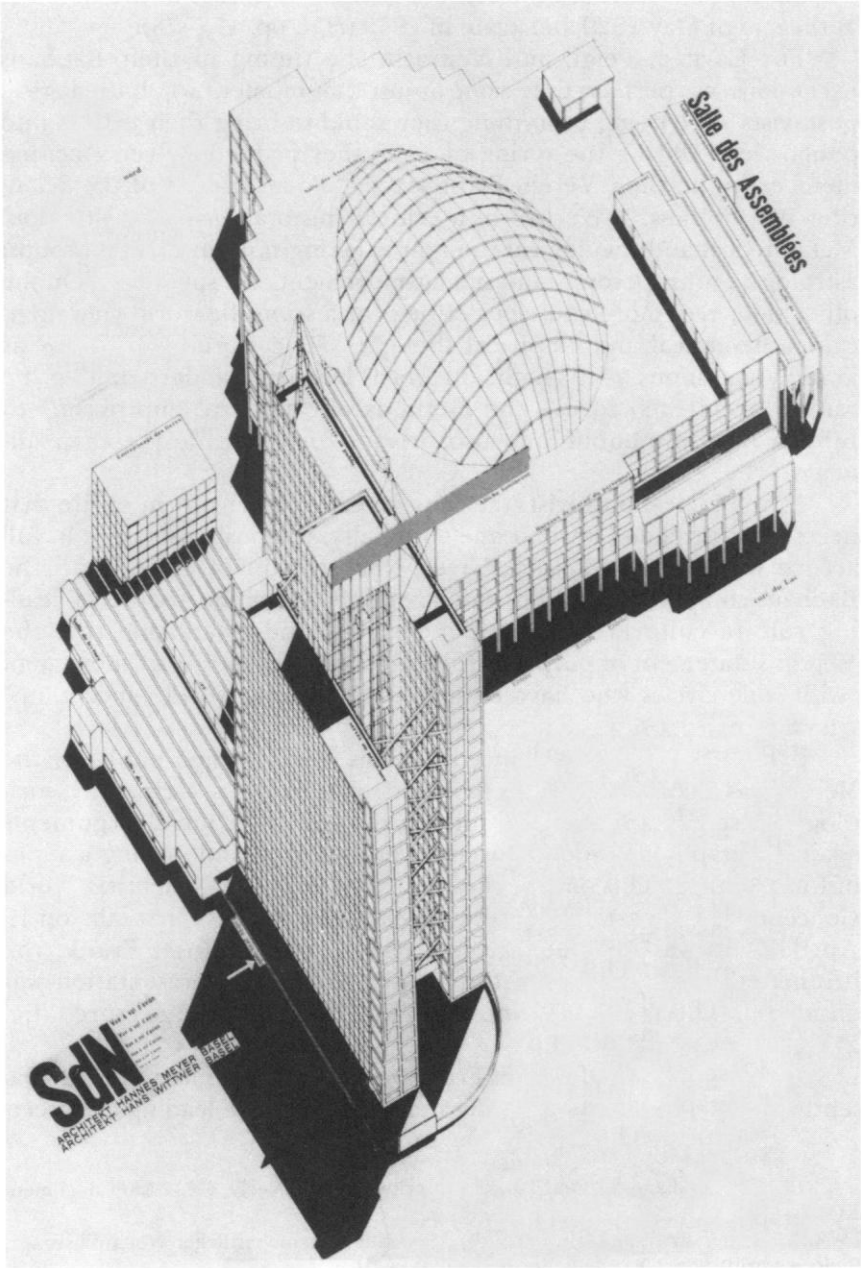


FIG. 1.—Hannes Meyer, proposal for the League of Nations Palace in Geneva, 1927. From *Hannes Meyer 1879–1954, architekt urbanist lehrer* (Berlin, 1989).

Vienna Circle.¹⁹ Neurath himself was invited to lecture at the Bauhaus at the end of May 1929 and again in 1930 (*HM*, pp. 177–78).

For Carnap, Feigl, and Neurath, the timing of their Bauhaus excursions was perfect; they came at just that moment when the logical positivists were doing everything they could to bring their efforts into public view. During the spring of 1929 they printed a flyer soliciting membership in their Verein Ernst Mach: “To all friends of the Scientific World View!” “We live in a critical spiritual [*geistigen*] situation! Metaphysical and theological thought is taking hold in certain groups; astrology, anthroposophy and similar movements are spreading. On the other side: ever more conscious efforts for a scientific world view, logical-mathematical and empirical thought.” The Verein’s project was grandly ambitious as it sought (in words by then standard among the radical architects) to use the methods of “modern empiricism” to reform not only public but also private forms of life [*Lebensgestaltungen*].²⁰

In the logical positivists’ attempt to create a new form of life that necessarily extended beyond one’s specialty, the positivists were in full accord with the Bauhäusler. Given Neurath’s involvement with the Bauhaus controversy and his stated admiration for the architects’ leading role in cultural reform, it is perhaps understandable that the Verein’s statement of purpose affiliated the logical positivist movement “with wide circles who have trust in the scientific world conception.” All were invited to join.²¹

The first project announced for this new widened public of the Verein was a series of lectures to include mathematics, astronomy, sociology of science, modern architecture, and (of course) arguments against metaphysics. Soon another flyer appeared announcing a series of four lectures. This one was headed: “Friends of the Scientific World Conception!” Of particular interest to us is that the very first talk, on 19 April 1929, was given by the Austrian architect Josef Frank, the brother of Philipp Frank of the Vienna Circle. His presentation was entitled “Modern World Conception and Modern Architecture” (fig. 2).²²

It was an apt choice. Josef Frank was deeply, if sometimes ambivalently, involved with the Bauhaus and was one of the leading architects

19. Carnap diary, 21 Oct. 1929, transcription by Heverly, CP, PASP, document RC 025-73-03.

20. Verein Ernst Mach flyer, “An alle Freunde wissenschaftlicher Weltauffassung!” [before April] 1929, CP, PASP, document 029-30-01.

21. *Ibid.*

22. Verein Ernst Mach flyer, “Freunde wissenschaftlicher Weltauffassung! . . . Vorträge,” n.d., CP, PASP, document 029-30-02.

VEREIN ERNST MACH
SITZ: WIEN, I. BEZIRK, WIPPLINGERSTRASSE 8, III III 331 TELEFON Nr. U 24-3 10

Freunde wissenschaftlicher Weltauffassung!

Der Verein Ernst Mach, der sich zur Aufgabe gestellt hat, wissenschaftliche Weltauffassung zu fördern, veranstaltet in den nächsten Monaten nachstehende

VORTRÄGE und zwar:

Freitag, den 19. April 1929
Prof. JOSEF FRANK: Moderne Weltauffassung und moderne Architektur.

Freitag, den 10. Mai 1929
Univ. Prof. HANS HAHN: Überflüssige Wesenheiten (Occams Rasiermesser).

Freitag, den 24. Mai 1929
Bez.-Sch.-Insp. HEINRICH VOKOLEK: Begabung-problem und Vererbungslehre.

Freitag, den 14. Juni 1929
Priv. Doz. RUDOLF CARNAP: Scheinprobleme der Philosophie (von Seele und Gott).

◊ Sämtliche Vorträge finden im großen Hörsaal des Mathematischen Institutes der Wiener Universität, Wien, IX, Strudlhofgasse Nr. 4, Erdgeschoß statt.

BEGINN 19 UHR

REGIEBEITRAG 50 GROSCHEN — FÜR MITGLIEDER EINTRITT FREI

Beitrittserklärungen werden im Sekretariate des Vereines und bei den Vortragsabenden angenommen.

DER VORSTAND.

FIG. 2.—Flyer for lectures held by the Verein Ernst Mach, 1929. Carnap Papers in the Archives of Scientific Philosophy, University of Pittsburgh Libraries, University of Pittsburgh, document 029-30-01.

in Austria. Working with Oskar Strnad and Oskar Wlach, he had produced, even before World War I, some of the most striking modern residences in Austria. In 1927, the German Werkbund had invited him to contribute to the Stuttgart Exhibition under the overall direction of Mies van der Rohe. That modernist housing development was to demonstrate the future of a whole neighborhood designed in the new style, and included an astonishing collection of progressive architects, among whom were Le Corbusier and Gropius. Philip Johnson later called the enterprise, known as the Weissenhof development, “the most important group of buildings in the history of modern architec-

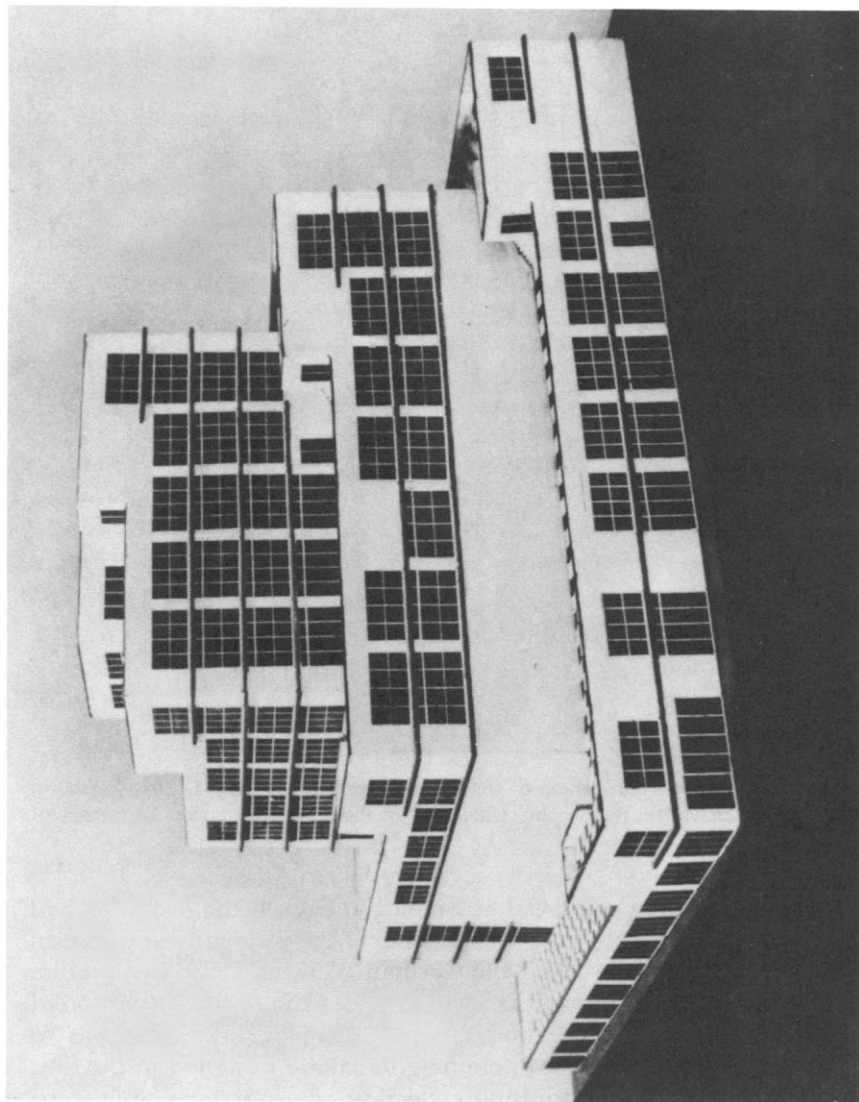


FIG. 3.—Josef Frank, Terrace Restaurant, 1925. From *Josef Frank, 1885–1967*, ed. Johannes Spalt (Vienna, 1981).

ture.’”²³ In addition to his strictly architectural accomplishments, Frank soon became the central theorist of the Austrian Werkbund. In that capacity he tried to navigate between left and right, between a naively progressivist (and, in his view, affected) functionalism of the Germans and his own countrymen’s penchant for ornamentation, regionalism, and nationalism. It was a path he found difficult, at times even hopeless, to pursue.²⁴

If Frank was at the center of the new architecture, he was not far from the vortex of the new scientific philosophy. For several years he designed architecture for Neurath’s museum for picture statistics, a place where facts about the material conditions of the different classes could be presented in clear displays of billboards and graphs. It was a project that Neurath had held to be absolutely essential as a means of educating the masses; by its reliance on images rather than language, the picture museum would bridge the gap between nationalities. Neurath never lost faith that “just through its neutrality, and its independence of separate languages, visual education is superior to word education. *Words divide, pictures unite*” (*ES*, p. 217).²⁵ As with his commitment to the simplified universal jargon of “Basic English,” his focus on the protocol sentences, and his apolitical politics, Neurath’s pictures were intended as clear, universal building blocks on which all else could be built. Its international character, its constructivist dimension, and its visual simplicity all would have been appealing to the Bauhäusler when Neurath presented his work in 1929 (*HM*, p. 177).²⁶ Out of simple pictorial elements such as a machine, a worker, or coal, one could construct standardized representations of the distribution of industry, housing, and other aspects of material life. The ISOTYPE system (as it was called) was essentially a linguistic and pictorial form of transparent construction (fig. 4).²⁷

In a letter, Neurath referred approvingly to Frank’s design of the museum and its exhibitions: “The museum overflows with the old *Sachlichkeit*. Completely geometrical. Everywhere tables of commensurable quantities, and the whole put together with open space surrounding the tables.”²⁸ Neurath’s reference to the artistic movement of the *Neue*

23. Hans M. Wingler, *The Bauhaus: Weimar, Dessau, Berlin, Chicago*, trans. Wolfgang Jabs and Basil Gilbert, ed. Joseph Stein (1969; Cambridge, Mass., 1978), p. 534.

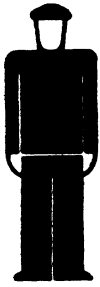
24. Friedrich Achleitner, “Wiener Architektur der Zwischenkriegszeit: Kontinuität, Irritation und Resignation,” in *Das geistige Leben Wiens in der Zwischenkriegszeit*, ed. Peter Heintel et al. (Vienna, 1981), pp. 290–91.

25. See also Kinross, “Otto Neurath et la communication visuelle,” p. 273, and Paul Neurath, “Souvenirs des débuts des statistiques illustrées et de l’isotype.”

26. Neurath’s lecture was titled “Picture Statistics and the Present.”

27. For more on Neurath’s picture language and his vision of the social uses of statistics, see Kinross, “Otto Neurath et la communication visuelle,” and *Arbeiterbildung in der Zwischenkriegszeit*.

28. Neurath to Roh, n.d. [probably 1924], Roh Collection.



worker



coal



coal-worker



**coal produced
by machine**



**coal produced
by hand**

FIG. 4.—Figures built from simple elements in ISOTYPE. From Otto Neurath, *International Picture Language: The First Rules of ISOTYPE* (London, 1936).

Sachlichkeit or “new objectivity,” a coldly clinical realist style, was apparently just one of many. According to Feigl, both Neurath and Carnap regularly referred to the Vienna Circle’s logical positivism as “an expression of the *neue Sachlichkeit*.”²⁹

3. Hausgewordene Logik

For the Vienna Circle, no philosophical work stood for this new objectivity as well as Wittgenstein’s *Tractatus Logico-Philosophicus* of 1921. Indeed, it is nearly impossible to exaggerate the effect of the *Tractatus* on the Vienna Circle, where it was read out loud sentence by sentence twice, beginning in the Circle’s Thursday meetings of 1926–27.³⁰ A trace of this devotion remains in the archives, where one finds a list of affirmations, a kind of positivist catechism, indicating, proposition by proposition, how each member of the Circle would vote on particular assertions before reading the *Tractatus* and after. For example: “The meaning of a sentence is through its method of verification.”³¹ Though Wittgenstein himself resisted being assimilated into the positivist camp, his commitment to a building up from verifiable propositions was similar enough to the aspirations of the Vienna Circle for the positivists to have seen Wittgenstein as a prophet of their philosophical modernism.

Wittgenstein’s success with the *Tractatus* did not rescue him from his turbulent inner life. During World War I he voluntarily left philosophy to become a frontline soldier. War wounds left him hospitalized; when they healed, he turned first to gardening and then to teaching school in a remote mountain village. Just as the instruction of the young began to pale as a career, one of Wittgenstein’s sisters, Margarethe Stonborough, commissioned a long-time family friend (and student of the architect Alfred Loos), Paul Engelmann, to design a large house on the Kundmannngasse in Vienna.

“You are me!” Loos once said to Wittgenstein.³² Their common search for elimination of the superfluous, and their commitment to

29. Feigl, “The Wiener Kreis in America,” p. 637.

30. Haller, “New Light on the Vienna Circle,” p. 27. For more on the relation between the Vienna Circle and Wittgenstein, see the essays in *Wittgenstein, der Wiener Kreis und der kritische Rationalismus*. Allan Janik and Stephen Toulmin’s well-known *Wittgenstein’s Vienna* (New York, 1973) ties Wittgenstein’s thought to controversies about language originating in the gap that arose between the political structure of the declining Austro-Hungarian empire and the new social and economic realities of turn-of-the-century Vienna.

31. Notes by Rose Rand, “Entwicklung der Thesen des ‘Wiener Kreises,’” Nov. 1932–Mar. 1933, CP, PASP, document 081-07-01.

32. Paul Engelmann, *Letters from Ludwig Wittgenstein, with a Memoir*, trans. L. Furtmüller, ed. B. F. McGuinness (1967; New York, 1968), p. 127.

basic forms out of which the more complex would be derived, brought them to mutually sympathetic renditions of modernity. Loos's prewar volume, *Ornament and Crime*, had already laid the groundwork for his economic, moral, and aesthetic crusade against the decorative: "I have discovered and given to the world the following notion: the evolution of civilization is synonymous with the elimination of ornament from the utilitarian object."³³ After the war, Engelmann found Loos's buildings and Wittgenstein's *Tractatus* opposing parallel targets: Loos aimed at the arts-and-crafts movement with its claims to higher spirituality while Wittgenstein laid his sights on the metaphysical system-builders of philosophy.³⁴ The *Tractatus* ends on a cautionary note, calling for philosophy to act as a kind of conscience against going beyond what can be said (such as the verifiable propositions of natural science). In sympathy with Loos's *Ornament and Crime*, Wittgenstein had written a kind of *Metaphysics and Crime*, with philosophy acting as the police.

At the same time, the philosophical and architectural projects shared an ideology of modernism: among other things, the *Tractatus* is a testimonial to the possibility of *building up* from simples into larger wholes. Its doctrine about logical propositions is precisely that from the elementary truth tables of simple propositions all others can be formed. "Mechanics determines one form of description of the world by saying that all propositions used in the description of the world must be obtained in a given way from a given set of propositions—the axioms of mechanics. It thus supplies the bricks for building the edifice of science, and it says, 'Any building that you want to erect, whatever it may be, must somehow be constructed with these bricks, and with these alone.'³⁵ The architectural metaphor, I suggest, is not accidental. Whether he uses the verbs *bilden*, *bauen*, or the nouns *Konstruktion* or *Bau*, the Wittgenstein of the *Tractatus* is after an image of language, logic, and the world that starts at the basics and works up from there using logic alone. When complete, the structure would be without superfluity. At the time such a constructivist reading was encouraged all the more by Bertrand Russell's introduction to the first edition of the work, in which the British philosopher identified Wittgenstein's starting points as atomic sentences and continued the building metaphor through the idea of "molecular propositions" made from them.³⁶

Wittgenstein's long-standing friendship with Engelmann and early admiration for Loos's architecture gave him personal and aesthetic

33. Benedetto Gravagnuolo, *Adolf Loos, Theory and Works*, trans. C. H. Evans (New York, 1982), p. 67.

34. Engelmann, *Letters from Ludwig Wittgenstein*, p. 128.

35. Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, trans. D. F. Pears and McGuinness (London and Henley, 1976), prop. 6.341, p. 68.

36. Bertrand Russell, introduction to *ibid.*, p. xiv.

reasons to be enthusiastic about the Engelmann designs. Basic block elements characterized Loos's exterior designs, and in this respect his student Englemann followed the master in his early (1926) drawings of the basic structure of the Wittgenstein house. If Neurath, Carnap, and Feigl came to view the form of life surrounding modern art as an inspiration for their philosophy, Wittgenstein went further. Riveted by the Engelmann sketches, Wittgenstein began to reformulate every interior detail of the house, from windows to radiators. The emphasis on "industrial" design elements that expose the inner workings is apparent not only in the larger commitment to the hard-edged, but in details such as the transparent glass panels that leave the pulleys and counterweights of the elevator visible, or in the industrial-style columns with their recessed heads.³⁷ In its commitment to clean lines, simple elements, exposed functional elements, and empty spaces, the house at Kundmannngasse took the style of Loos's exteriors and brought them inside. At least one architectural historian suggests that Wittgenstein's designs may have inspired Loos to include interiors in his drive against ornamentation.³⁸

In the end, the most striking contemporary characterization of the link between Wittgenstein's philosophy and his architecture came from one of Wittgenstein's other sisters, Hermine Wittgenstein. Shocked by the cold formality of the building, its absence of ornament and comforting decoration, she dubbed it "hausgewordene Logik" ["logic become house"]—an entirely appropriate appellation capturing the spirit of construction from simples that characterized both sides of the equation (*ALW*, p. 32).³⁹

By the end of 1926, Wittgenstein and Engelmann are listed together as "Architekten" on the building permit, and in 1928, Witt-

37. Bernhard Leitner, *The Architecture of Ludwig Wittgenstein: A Documentation, with Excerpts from the Family Recollections by Hermine Wittgenstein*, ed. Dennis Young (New York, 1976), pp. 82–83, 102–3; hereafter abbreviated *ALW*.

38. See Gravagnuolo, *Adolf Loos, Theory and Works*, p. 82.

39. The later Wittgenstein famously rejected the linear constructivism associated with his *Tractatus*. Commencing with the *Blue Book* (dictated in 1933–34), Wittgenstein introduced a raft of concepts that opposed the notion of a building up from primitive elements. In the *Blue Book*, for example, he explicitly denounced the notion that there is an essence of an object that can be characterized by necessary and sufficient conditions. Instead, similarity or conceptual unification occurs through family resemblance, where no single specifiable property is present in all cases. Even later, in the *Philosophical Investigations*, Wittgenstein clarified the notion of a language-game in order to make clear that he meant it to designate more than verbal behavior: "Here the term 'language-game' is meant to bring into prominence the fact that the *speaking* of language is part of an activity, or of a form of life [*Lebensform*]" (Wittgenstein, *Philosophical Investigations*, 3d ed., trans. G. E. M. Anscombe [New York, 1958], § 23). But even in these later works Wittgenstein's links with the wider Austrian culture show through: the notion of a form of life was, as I have stressed above, a commonplace in post-World War I Austria, and nowhere

genstein, by himself, signed at least one plan as “Architekt” (*ALW*, pp. 9, 10). So engrossed was Wittgenstein in his architectural endeavors that when members of the Vienna Circle (including Schlick, Carnap, Feigl, and Friedrich Waismann) made their pilgrimages to him in the

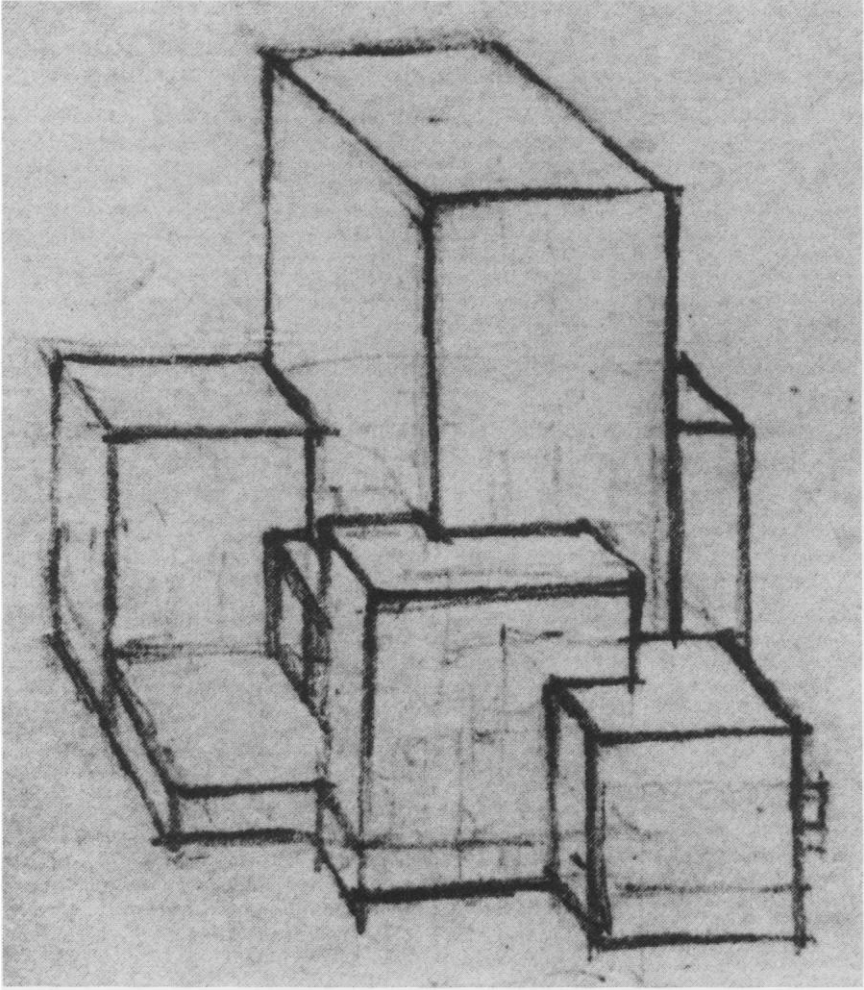


FIG. 5.—Paul Engelmann, sketch for the Stonborough House at Kundmannngasse. From *Ludwig Wittgenstein Sein Leben in Bildern und Texten* (Frankfurt, 1983).

as prominently as in the world of architecture, as it reached out to transform personal and public life. Of course, in Wittgenstein's hands, *Lebensform* was divorced from the left-political discourse that Gropius, Meyer, Neurath, and others had bestowed on it. In no sense did the architects and philosophers I am discussing here intend the term to convey a sense of the epistemic relativism that the term acquired after Wittgenstein.



FIG. 6.—Elevator in Stonborough House, 1926–28. Note the exposed workings. From Bernhard Leitner, *The Architecture of Ludwig Wittgenstein: A Documentation, with Excerpts from the Family Recollections by Hermine Wittgenstein*, ed. Dennis Young (New York, 1976).

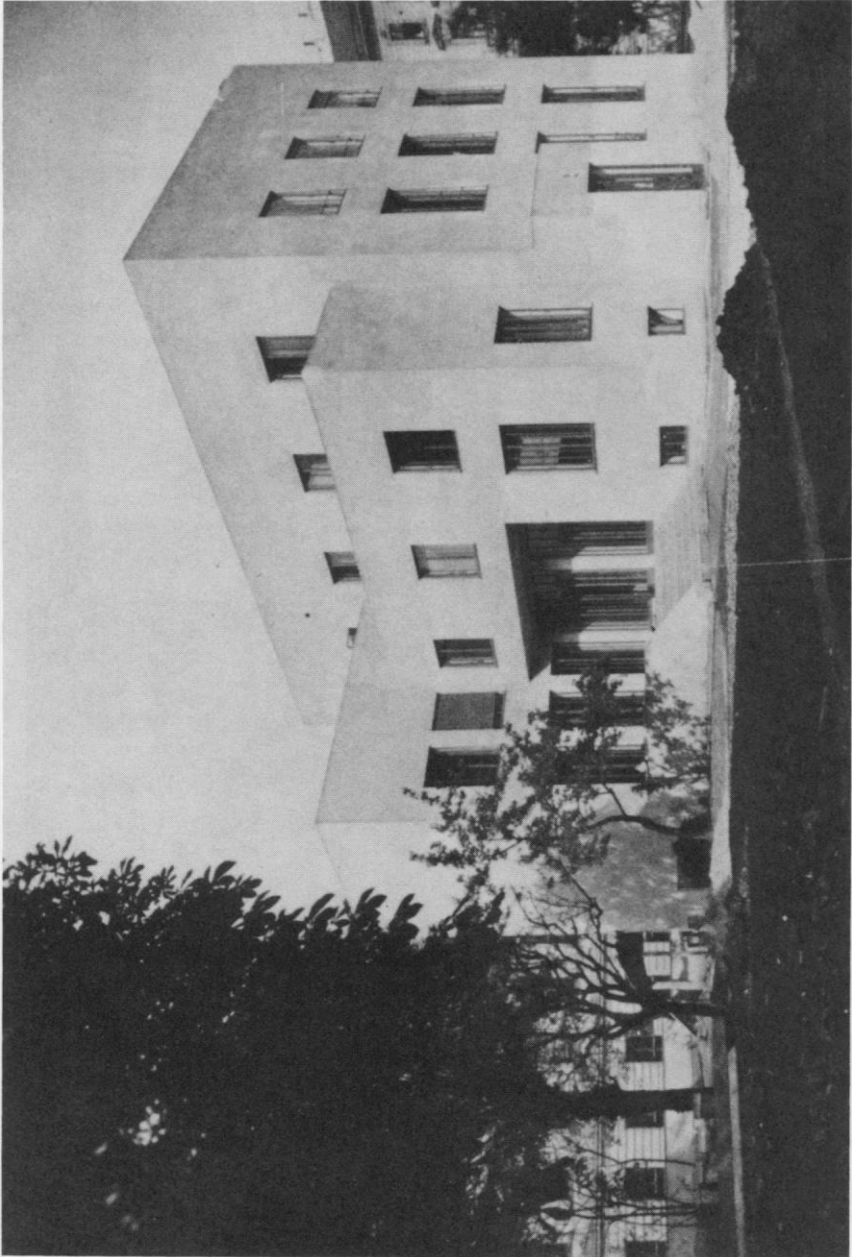


FIG. 7.—Stonborough House, exterior, 1928. From Leitner, *The Architecture of Ludwig Wittgenstein*.

late 1920s, he left them with the distinct impression that he was done with philosophy.⁴⁰

4. *The Architecture of the Aufbau*

For Carnap, by 1929, architecture would have stood out as an exemplar of modern culture. The new building style would have been a subject of concern not only in his meetings with Wittgenstein but in his conversations with Neurath and in the Verein's own 1929 lecture series, in which Carnap took part. That series began with Josef Frank's discussion linking the modern worldview with modern architecture. Carnap's contribution was "Pseudo Problems of Philosophy: God and the Soul." That summer, perhaps inspired by the lecture series, the Verein Ernst Mach decided to celebrate their leader's (Moritz Schlick's) decision to return from Stanford to Vienna and to decline a tempting offer from Bonn. Their project was to write a manifesto incorporating their earlier proclamations and invitations, and to present it to their returning hero. As he finished his contribution to the draft, Carnap wrote to Neurath: "You see, I couldn't decide to pass this draft—with or without blessings—even to you; this Opus that I formulated by the sweat of my brow and in the same sweat typed. No, the bitter obligation and sweet right of last formulation have remained with me. But at the very last minute before publication you can still make corrections!"⁴¹

In its final form, the group's *Wissenschaftliche Weltauffassung* resembled far more the polemical manifestos of art, architecture, and politics than the staid volumes of philosophy. Even the style of writing, with its declamations and call to action, paralleled the daring pronouncements of the Italian futurists or the Russian constructivists far more than the dense philosophical works of the British Hegelians or the German neo-Kantians. Its stated ambition was grand: "The Vienna Circle does not confine itself to collective work as a closed group. It is also trying to make contact with the living movements of the present, so far as they are well disposed toward the scientific world-conception and turn away from metaphysics and theology" (*ES*, p. 305).

According to the manifesto, all was to be grounded on the simplest elements of observation and then built up from them: "First [the scientific world-conception] is *empiricist and positivist*: there is knowledge only from experience, which rests on what is immediately given. This sets the limits for the content of legitimate science. *Second*, the scientific

40. Feigl, "The Wiener Kreis in America," p. 638. For more on the relation of Wittgenstein to the Vienna Circle, see *Wittgenstein, der Wiener Kreis und der kritische Rationalismus*.

41. Carnap to Neurath, 26 July 1929, CP, PASP, document 029-15-14.

world-conception is marked by application of a certain method, namely *logical analysis*.” Through this analysis the goal is to reach a unified science by “constituting” all scientific theories out of the elementary bits of perception. From the elementary aspects of the individual psyche it would rise to “a layer above” containing physical objects; these would then “constitute” other minds, and finally the objects of social science. With this building-up method, the constructional form [*Aufbauform*] of unified science would become clear (*ES*, p. 309).

The commitment to “removing the metaphysical and theological debris of millennia” was a distinctly modernist, and political, endeavor, as Carnap and his colleagues made explicit when they situated their dispute with traditional philosophy as issuing from “fierce social and economic struggles.” The manifesto declaimed: “one group of combatants, holding fast to traditional social forms, cultivates traditional attitudes of metaphysics and theology whose content has long since been superseded; while the other group . . . faces modern times, rejects these views and takes its stand on the ground of empirical science.” As the Bauhäusler did on every possible occasion, Neurath, Carnap, and the others used the manifesto to tie their mission to the image of industrial machinery, to the “modern process of production, which is becoming ever more rigorously mechanised and leaves ever less room for metaphysical ideas” (*ES*, p. 317). The modernism both groups had in mind would not stop at the traditional boundaries of science or art; they would reform fundamental aspects of daily life. Again the Vienna Circle manifesto: “We witness the spirit of the scientific world-conception penetrating in growing measure the forms of personal and public life, in education, upbringing, architecture, and the shaping of economic and social life according to rational principles” (*ES*, pp. 317–18).

Not surprisingly, since Carnap helped to draft it, the goals set out by the *Wissenschaftliche Weltauffassung* were closely tied to the goals of his just-completed masterwork, *Der Logische Aufbau der Welt*, usually translated as *The Logical Structure of the World*, but perhaps better rendered as *The Logical Construction of the World* since Carnap uses the terms *Struktur* and *Strukturform* in other, distinct ways (*ES*, p. 309).⁴² Indeed, Carnap was enormously impressed with Bertrand Russell’s

42. In the original German edition: “In die wissenschaftliche Beschreibung kann nur die *Struktur* (Ordnungsform) der Objekte eingehen, nicht ihr ‘Wesen’” (*Wissenschaftliche Weltauffassung der Wiener Kreis* [Vienna, 1929], p. 20). Carnap’s own *Der Logische Aufbau der Welt: Scheinprobleme in der Philosophie* (1928; Hamburg, 1961) has a separate section on “Die Strukturbeschreibung” (pp. 14–15); hereafter abbreviated *A*. *The Logical Structure of the World: Pseudoproblems in Philosophy*, trans. Rolf A. George (Berkeley and Los Angeles, 1969) is the standard translation of Carnap’s *Aufbau*; hereafter abbreviated *LS*. Where possible I have used this translation, though occasionally I have modified the translation on certain crucial points.

foundational view of objects as a logical construction of simple sense perceptions. As the epigram for the *Aufbau*, Carnap quoted (in English) from Russell's 1914 book, *Our Knowledge of the External World*: "The supreme maxim in scientific philosophizing is this: Wherever possible, logical constructions are to be substituted for inferred entities" (A, p. 1; LS, p. 5). In his idiosyncratic shorthand, Carnap has inscribed a comment near the end of chapter three, where Russell argues that a simplified construction, reconciling physics and psychology, is probably possible, but that he did "not yet know to what lengths this diminution in our initial assumptions" could be carried. The remark reads: "This deepening and diminution of the initial assumptions is my task!"⁴³

In the *Aufbau*, Carnap tried to realize the constructional program announced in the *Wissenschaftliche Weltauffassung* and promised in the margins of Russell's *Our Knowledge of the External World*:

Unlike other conceptual systems, a constructional system undertakes more than the division of concepts into various kinds . . . it attempts a step-by-step derivation or "construction" of all concepts from certain fundamental concepts, so that a genealogy of concepts results in which each one has its definite place. It is the main thesis of construction theory that all concepts can in this way be derived from a few fundamental concepts, and it is in this respect that it differs from most other ontologies. [A, p. 1; LS, p. 5]

Even Carnap's imagery is strongly architectural: the system has its *Grundbegriff*, *Grundgegenstand*, *Grundelemente*, *Grundwissenschaft*, and all the levels that build on them. Indeed, in summing up the task facing the scientific philosopher, Carnap insists that it is "no longer the task of the individual to erect the whole structure [*Gebäude*] of philosophy in one bold stroke." Elsewhere he adds that the philosopher's task is one of a "long, planned construction [*Aufbau*] of knowledge upon knowledge"; "a careful stone-by-stone erection of a sturdy edifice [*Bau*] upon which future generations can build" (A, p. xix; LS, pp. xvi–xvii).

It may be possible to interpret some of the above remarks as metaphorical, as such foundationalism was a long-standing theme in German philosophy. But in the preface to the *Aufbau*, Carnap makes the link to architecture literal and relaxes his otherwise technically encumbered language:

We do not deceive ourselves about the fact that movements in metaphysical philosophy and religion which are critical of such [a

43. Carnap, personal copy of Russell's *Our Knowledge of the External World as a Field for Scientific Method in Philosophy* (Chicago and London, 1914), p. 97, in CP, PASP. My thanks to Richard Creath for the location of Carnap's copy of Russell's book.

scientific] orientation have again become very influential of late. Whence then our confidence that our call for clarity, for a science that is free from metaphysics, will be heard? It stems from the knowledge or, to put it somewhat more carefully, from the belief that these opposing powers belong to the past. We feel that there is an inner kinship between the attitude on which our philosophical work is founded and the intellectual attitude which presently manifests itself in entirely different walks of life; we feel this orientation in artistic movements, especially in architecture, and in movements which strive for a meaningful form of human life [*Gestaltung des menschlichen Lebens*], of personal and collective life, of education, and of external organization in general. We feel all around us the same basic orientation, the same style of thinking and doing. . . . Our work is carried on by the faith that the future belongs to this attitude. [A, p. xx; *LS*, pp. xvii–xviii]

Again, Carnap is after more than a contribution to philosophy; he is trying to participate in the creation of a “form of life” of which the *Aufbau*, the scientific world-conception, and modern architecture are all a part. Carnap finished the preface to the *Aufbau* in May 1928, and the book appeared later that year. With the new outward push of the Verein Ernst Mach in 1929, the architects and artists whom Carnap hoped would welcome the work did so, and Carnap accepted Meyer’s invitation to Dessau.

5. Carnap in Dessau

Carnap arrived in Dessau on Tuesday, 15 October 1929 and was plunged immediately into a discussion about whether one should pursue only the aesthetic properties of materials. For the Bauhäusler this was a pressing issue, and the split between the “functional” and the aesthetic divided the faculty. Meyer led the charge against the aesthetic because it was metaphysical, that is, it included purely compositional content over and above what was technically demanded. After lecturing on “Science and Life,” Carnap met with Ludwig Hilberseimer, Meyer’s crucial appointment to the architectural department. Hilberseimer and his colleagues insisted that not only the artists’ theories but also their objects (such as the Bauhaus lamps) still contained metaphysics, and that these needed to be purged.⁴⁴ In fact, the Bauhaus lamps provide an exemplary illustration of the tensions between conflicting impulses within the movement.

Moholy-Nagy, responding to Gropius’s plea for the metal workshop to become a laboratory for industrial production, supported

44. Carnap diary, 15 Oct. 1929, CP, PASP, document RC 025-73-03.



FIG. 8.—Karl Jucker and Wilhelm Wagenfeld, glass lamp, 1923–24. Bauhaus-Archiv, Museum für Gestaltung, Berlin. Photo: Markus Hawlik.

inquiries into new lighting fixtures. Indeed Moholy-Nagy's own paintings inspired Wilhelm Wagenfeld and Karl Jucker in their creation of the best known of the Bauhaus lamps, one they advanced in 1924. It was a sleek design incorporating basic geometrical elements: a hemispherical opalescent glass shade, a transparent cylindrical glass stem, and a disk-shaped glass base, and visible inner wiring (fig. 8). As was so often the case, however, what struck the Bauhäusler as the very quaintness of industrial practicality was viewed quite differently from the factory floor. "Retailers and manufacturers laughed at our efforts," lamented Wagenfeld. "These designs which looked as though they could be made inexpensively by machine techniques were, in fact, extremely costly craft designs" (*BR*, p. 112). By the time of Carnap's visit in 1929, this conflict between artisanal reality and industrial aspirations had evidently broken to the surface, for it is the residual craft component that Hilberseimer derided as "metaphysical." By coordinating their causes and language, Hilberseimer and Carnap located a common foe in the ornamental and nonfunctional, be it in decorative art or metaphysical philosophy.

On Wednesday, 16 October, Carnap gave his lecture "The Logical Construction of the World," beginning with the logical positivists' rally-

ing cry: "There is only one Science ('Unified Science'), not separate subjects. . . . for all knowledge stems from one source of knowledge: experience—the unmediated content of experience such as red, hard, toothache, and joy. These make up the 'given.'" In summary, he educated four theses: (1) there are no things outside of the experiential—no realism about things; (2) there are no forces over and beyond relative motions—no metaphysics of force; (3) there is no psychology of the other that is not grounded in an individual's own experience—no psychorealism; (4) there are no social objects such as the state or the *Volk*. On this last point—and this would have been well received by Meyer's faction of the Dessau Bauhaus—he insisted that the Marxist conception of history *was* allowable because it was based on the empirically determinable. Carnap's basic slogan: Exclude metaphysics and limit utterances to those about the given. For example: dispose of the idea of God. And feelings attributed to others as well as *Verstehen* in history *are not knowledge*. For over an hour the architects and painters of the Bauhaus vigorously discussed the lecture, until Carnap retired at one that morning.⁴⁵

Over the intervening years, much of what Carnap was opposing has lost its direct political significance. But in 1929 Carnap's four theses bore a manifest coherence in their opposition to powerful right-wing forces that sought to unify these ideas of *Volk*, metaphysics, the state, and God. The journal of the German Philosophical Society, *Blätter für Deutsche Philosophie*, is replete with examples. Consider, for example, the volume for 1929/30, which included lead articles such as "Volk as the Bearer of Education," "The Historical-Metaphysical Sense of Germanity [*Deutschtums*] and Its Surrounding World," and favorable book reviews of *The Logic of the Soul*, *The Doctrine of the State as Organism*, and *Godliness in the Character of the "Volk."*⁴⁶ The avowedly politicized, religious, and nationalistic character of such polemics helped bind together, by their opposition, the left-wing modernists of the Vienna Circle and the Dessau Bauhaus. Both were committed to a rationalism, secularism, and internationalism that they hoped to secure by a logical and empirical construction. In the days that followed, Carnap lectured on the four-dimensional world and on the misuses of language. Following his main interest—the elimination of all that did not flow from the simple unifying elements of experience—Carnap argued in one discussion that the Bauhäusler still had not rid themselves of metaphysics in their theoretical work. His example was that the proposition "black or white is heavy" could not be interpreted directly; its only significance came through psychological association.⁴⁷

45. Transcript of Carnap's lecture, "Der logische Aufbau der Welt," 17 Oct. 1929, document dated 10 Oct. 1929, CP, PASP, document 110-07-45.

46. See *Blätter für Deutsche Philosophie* 3 (1929/30).

47. Carnap diary, Saturday, 19 Oct. 1929.

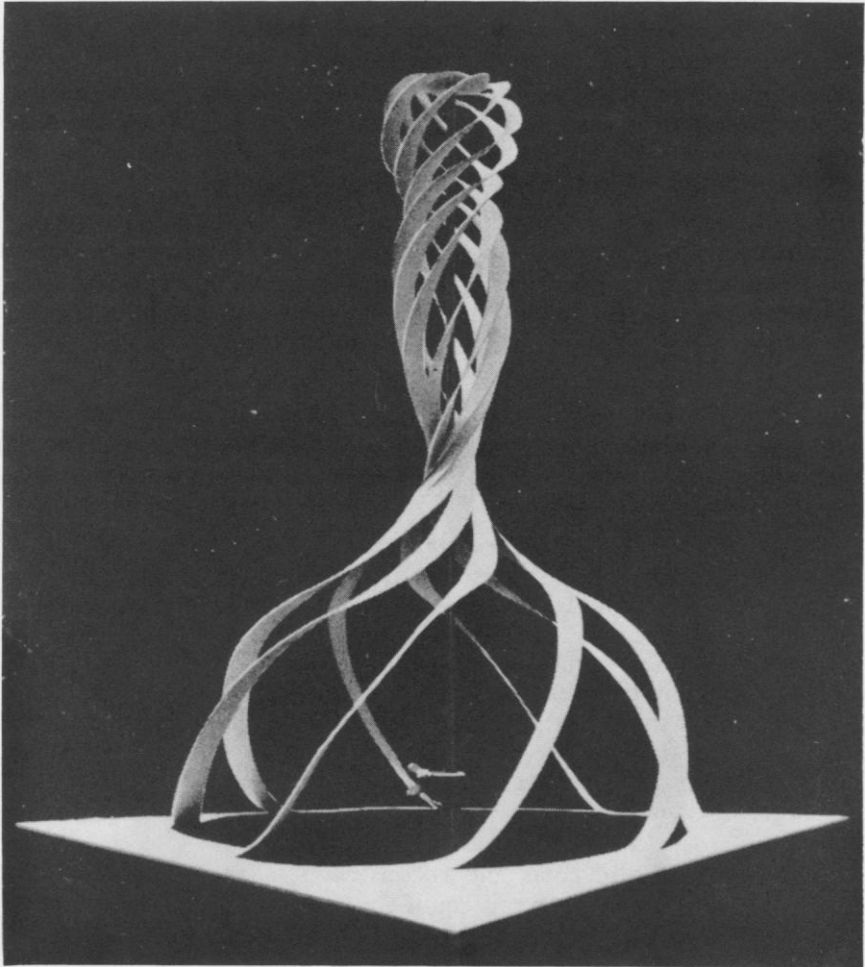


FIG. 9.—Geometrical paper form from Josef Albers's preliminary course, 1927. Bauhaus-Archiv, Museum für Gestaltung, Berlin.

On Sunday, Alfred Arndt took Carnap to the Bauhaus exhibition, where the philosopher was particularly impressed by the fundamental researches of the preliminary course: geometrical surface theory and forms made out of paper and wire screens (fig. 9).⁴⁸ Carnap's fascination with these ethereal geometrical forms was perfectly understandable: ever since his doctoral dissertation in Jena on "Space,"⁴⁹ he had pursued his interest in geometry; moreover, the subject of geometry, as axiomatized and revived by the mathematician David Hilbert, provided a model

48. Carnap diary, Sunday, 20 Oct. 1929.

49. Carnap, "Der Raum. Ein Beitrag zur Wissenschaftslehre," *Kant-Studien*, Erg. Heft no. 56 (1922): 1-87.

for the construction process he had in mind for all of philosophy. At the preliminary course exhibition, Carnap met Kandinsky for the first time; it was, of course, no surprise that Kandinsky was there, as he was one of the leaders of the constructivist curriculum.

Not only would Carnap have found the subject matter of these geometrical explorations interesting, but the sentiment would surely have been returned. Carnap's thesis on space and his *Aufbau* were cited, for example, when the Bauhäusler wrote on space.⁵⁰ Carnap and Kandinsky shared the basic faith in a building up from the elementary. In the book that grew out of his preliminary course, Kandinsky called his artistic goal "practical" science.⁵¹

The work in the Bauhaus is synthesis.

The synthetic method naturally embraces the analytical one. The interrelation of these two methods is inevitable.

The instruction in the fundamental elements of form must also be built on this basis.

The general problem of form must be divided into two parts:

1. Form in its narrower sense—plane and space.
2. Form in its broader sense—color and the relation to form in its narrower sense.

In both cases the work has to begin with the simplest shapes and systematically progress to more complicated ones. Hence, in the first part of the investigation of form the plane is reduced to three fundamental elements—triangle, square, and circle—and space is reduced to the resulting fundamental space elements—pyramid, cube, and sphere.⁵²

The analysis into parts and reconstruction from geometry and color directly paralleled the project of Carnap's *Aufbau*. In the place of color and geometry, Carnap and his Vienna Circle had protocol sentences (expressing primitive sense experiences) and combinations of these protocol sentences using logic. Carnap's *Stufenform* [ascension forms] built up the complexities of all scientific terms out of these elements just the way Kandinsky's elementary geometrical forms made up the human figure. In both Bauhaus and *Aufbau*, construction from the intelligible simples eliminated the metaphysics of the unnecessary, the merely decorative.

Despite Kandinsky's attempt to make a "practical" science of color and form, he and others often referred to the "temperature" or the

50. László Moholy-Nagy, *The New Vision: Fundamentals of Design, Painting, Sculpture, Architecture*, trans. Daphne M. Hoffmann (New York, 1938), p. 162.

51. Wassily Kandinsky, *Point and Line to Plane*, trans. Howard Dearstyne and Hilla Rebay (New York, 1947), p. 20.

52. Kandinsky, "Staatliches Bauhaus Weimar 1919–1923" (Weimar-Munich, 1923), p. 26; reprinted in Wingler, *Bauhaus*, p. 74.

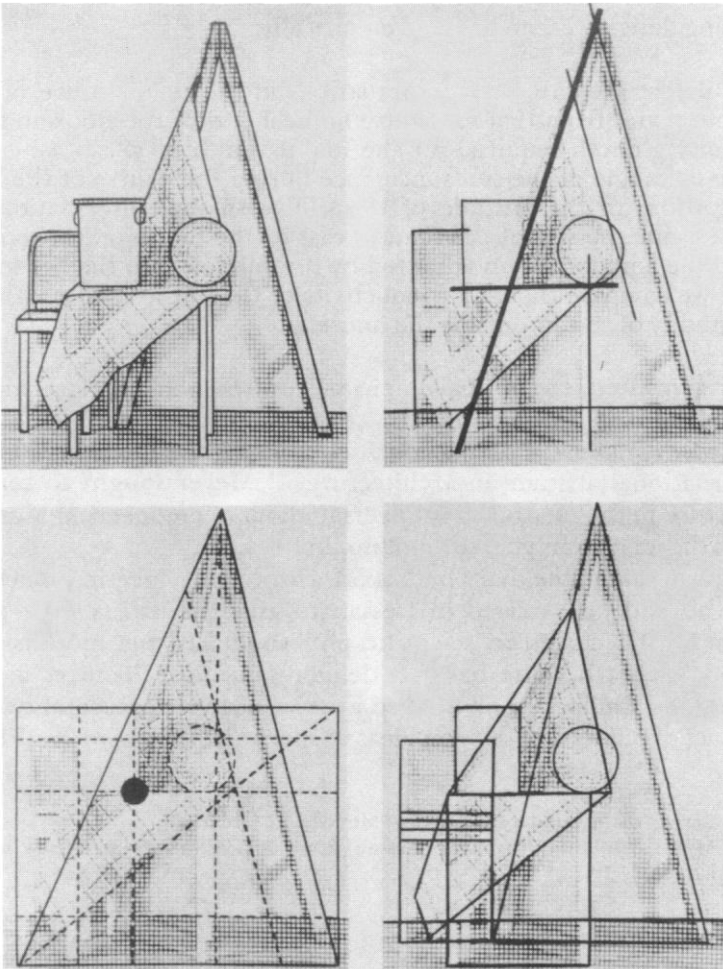
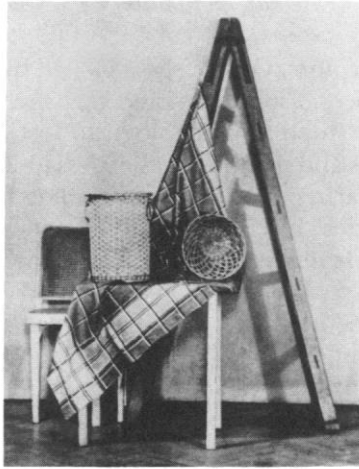


FIG. 10.—Wassily Kandinsky, analysis of still life, 1929–30. Bauhaus-Archiv, Museum für Gestaltung, Berlin.

“weight” of particular colors. Obviously offended by the “metaphysical” quality of such utterances, Carnap insisted that such propositions could only properly be understood as psychological. Jost Schmidt, one of the most versatile sculptors and painters at the Dessau Bauhaus, gave such a view a sympathetic hearing. But though Schmidt “was clear” on these issues, Carnap recorded his impatience to see Meyer himself. On Monday, 21 October Meyer returned, and he and Carnap met. Despite the fact that it was Gropius who had appointed Meyer head of the Dessau Bauhaus, Meyer was determined to break with the old guard. To Carnap he commented that, in the old Bauhaus of Gropius, one found the expression of an individual-sentimental attitude.⁵³ Nothing of the sort would be appropriate under Meyer’s leadership, as he had made clear in his article “Building” for the journal *bauhaus* the previous year. Instead of sentiment, historicity, or nationality, the basic elements of housing design were to be fixed empirically:

we determine the annual fluctuations in the temperature of the ground and from that calculate the heat loss of the floor and the resulting depth required for the foundation blocks. . . . we calculate the angle of the sun’s incidence during the course of the year according to the latitude of the site. with that information we determine the size of the shadow cast by the house on the garden and the amount of sun admitted by the window into the bedroom. . . . we compare the heat conductivity of the outside walls with the humidity of the air outside the house.

As Meyer insisted, the logical-empirical construction was inseparably associated with its internationality: “this constructive world of forms [*konstruktive Formenwelt*] knows no native country. it is the expression of an international attitude in architecture.”⁵⁴ Meyer sought to render architecture in the neutral and universal idiom of engineering; Carnap pursued the analogous goal for philosophy.

Appropriately, the diary breaks off with Carnap meeting Reichenbach, who had just arrived in Dessau to give the artists their next installment of lectures on scientific philosophy. In the months that followed, Neurath came back to deliver two more lectures at the Bauhaus, and Philipp Frank offered a series of three presentations on the impact of modern physics on ideas of space and time (*HM*, p. 178).

53. Carnap diary, Sunday, 20 Oct. and Monday, 21 Oct. 1929.

54. Meyer, “Building,” *bauhaus* [Dessau] 2, no. 4 (1928); reprinted in Wingler, *Bauhaus*, pp. 154, 153.

6. Neutrality and Nazism

Building up concepts and uniting the sciences out of simple propositions remained central to the logical positivists, so central, in fact, that different interpretations of their significance contributed to a division between Neurath and Schlick and, for a short period, strained relations between Neurath and Carnap. It seems that Neurath thought his colleague had infringed on his priority in the invention of these neutral bricks of knowledge.

If Neurath's faith in the neutral, scientific underpinnings served him in his quest for political unity in the 1919 revolution and its aftermath, political undercurrents again pressed on Neurath in the tumultuous years of the early thirties. And again Neurath responded with a commitment to technocratic Marxism that was of a piece with his more abstract philosophy. In October 1932, Neurath planned a trip to Moscow to discuss, *inter alia*, his plans for a branch of his picture museum. To Carnap he explained:

In the middle of October, I have to travel to Moscow and am not too pleased about having to deal with my ideology. Over there I'm a technical specialist and abstain from all arguments which only seem to lead to differences. If today something's a no, tomorrow it's a yes, as soon as there is change in the party line. I realize all that. But I accept the consequence of this ideological abstinence and concentrate on *the technical*.

Continuing in the same letter, without any apparent break, Neurath then switches to philosophy and speaks about the importance and priority of his work on the neutral protocol sentences that lie at the basis of the unified sciences.⁵⁵ So committed was Neurath to the idea of the technical, and so against the ideological, that at the outset of the Vienna Circle he was dead set against even mentioning "philosophy" when speaking of the new enterprise. "The word 'philosophy,'" Neurath wrote Reichenbach, "is above all laden with associated meanings of 'system,' 'basic statements about the world,' 'values,' etc." Even in talk about "positive philosophy," or "exact philosophy," Neurath saw danger. "The scientific stands in the center for us, the indeterminate on the periphery! With the philosophers it is backwards . . .!"⁵⁶ In both philosophy and politics Neurath had faith that a rigorous technical

55. Neurath to Carnap, 1 Oct. 1932, CP, PASP, document 029-12-29.

56. Neurath to Reichenbach, 22 July 1929, CP, PASP, document 029-15-15.

analysis would solve problems that had resolutely resisted solution when infused with values and worldviews.⁵⁷

The interpenetration of political and wider societal concerns in Neurath's reasoning is much more apparent in his letters than in his published philosophical tracts, as one sees in a letter of October 1932. At one point in the letter, his philosophical worry was about the relation of parts and wholes, and whether the basic statements of the constructional system can be Gestalt wholes rather than the constituent bits of perception: "I am amazed at how we can bring Schlick's Gestalt qualities into harmony with the philosophy of totalities. Give me a complex and I'll make a whole out of it—that's the slogan." Without missing a beat, Neurath moves from the wholes of philosophy to the cracks in society. "The tear is running . . . It'd be to throw up, if one didn't have to laugh. And behind it all stands Hitler. . . . Here comes God and Religion to the front and ancestral truths and the German *Volk*, and what you need to stab a Jewish socialist with a knife between the ribs. . . . Oh Carnap! Oh World!"⁵⁸

March 1933, Neurath to Carnap: "On Friday the Circle [met to discuss] Protocol sentences. Schlick was out of line [*ungehörig*]; started already arrogantly by saying that the thing didn't interest him, etc. Waissman in his own way [also objected]. They want instantaneous experience with 'now' and 'here'; they challenged the right to determine these [experiences] by means of coordinates" (this was necessary for Neurath's physical protocol sentences, which were to be interpersonal, not individual).⁵⁹ On this point Carnap would have concurred with Neurath, for after the *Aufbau* he increasingly came to view the starting points of the construction to be matters of convention. And given this conventional freedom, it was Neurath's firm view that the choice should be dictated by the practical advantage to the community. This demanded a language of physical effects not individual perceptions.⁶⁰ Given this division and his colleagues' relapse into what he considered crass idealism, Neurath commented that he thought the Vienna Circle would be misrepresented by Schlick at the forthcoming conference on the Unity of Science. Schlick, Neurath feared, would stand for the Vienna Circle the "way the third [Reich] claims alone to represent the nation."⁶¹ As a result Neurath was now ready to renounce the validity of the Vienna Circle's right wing—including Wittgenstein,

57. Neurath very deliberately used "Wissenschaftliche Weltauffassung" and not "Wissenschaftliche Weltanschauung" precisely because of the system-building implications of the latter.

58. Neurath to Carnap, 9 Oct. 1932, CP, PASP, document 029-12-24.

59. Neurath to Carnap, 13 Mar. 1933, CP, PASP, document 029-11-20.

60. Carnap, "Intellectual Autobiography," pp. 51–52.

61. Neurath to Carnap, 13 Mar. 1933, CP, PASP, document 029-11-20.

whom he judged hopelessly metaphysical. The perimeter of the circle shrank as Neurath grasped for a cohort of sympathetic souls. A few months earlier he told Carnap: "I want to belong to a *Gemeinschaft* consisting of [Philipp] Frank, Hahn, Carnap, Neurath and few younger people who are all driven by the unity of science."⁶²

By June 1933 Neurath's letters become increasingly despairing. "Sad times. But I'm looking around to see whether we can't find possibilities in the west. Carnap, Frank, Hahn, Neurath that should be the eternal quartet, for Schlick and his followers are slipping away into idealistic doubletalk."⁶³ Even Neurath's greatest commitment, his faith in the power of unity (personal, social, political, and philosophical), began to wane. "Up until now," he writes to Carnap, "I have had the inclination to emphasize the positive side and to leave criticism to the side in order to further community [*Gemeinschaft*]. But, I now feel—and I very much regret it—that I did not emphasize the Marxist deficiencies. . . . One sees *how weak* the foundation was in its components. We must build [*aufbauen*] anew, for this factual work is necessary and the many-sided refusal to accept Marxist superficiality. Youth is ready . . . to rebuild."⁶⁴ Defeated, the left was splintering, and the Vienna Circle itself began to fall apart along political lines.

With both Marxists and positivists on the run, the German Philosophical Society celebrated the Nazis' election to power. Their meeting of October 1933 opened with the collective singing of the "Deutschland Lied" and "The Horst Wessel Song." Now, the Nazi representative proclaimed, philosophy would be applicable to the people and fulfill the spiritual needs of the *Volk*. Hitler telegraphed a laudatory greeting, part of which read: "May the forces of true German philosophy contribute to the building and strengthening of the German worldview."⁶⁵ The philosophers complied with talks on *Deutschtum*, *Volk*, Soul, and Spirit.

Less than a year later, when the Vienna Circle confronted the right-wing philosophers at the International Philosophy Congress in Prague, a clash was inevitable. The principal nationalistic philosophy journal reported excitedly that the Congress had revealed philosophy to be at a turning point, as "a certain *Volk*" took its place in the development of the World Spirit. One of the heroes of nationalist philosophy, Hans Driesch, presented a plenary lecture, arguing for vitalism and

62. Neurath to Carnap, 22 Oct. 1932, CP, PASP, document 029-12-19. Even in the *Tractatus*, Wittgenstein left some qualified room for the mystical. Though such statements were sharply delineated from the verifiable, any such discussion was manifestly too much for Neurath.

63. Neurath to Carnap, 18 June 1933, CP, PASP, document 029-11-14.

64. Neurath to Carnap, 6 Apr. 1933, CP, PASP, document 029-11-18.

65. "Bericht über die 12. Tagung der Deutschen Philosophischen Gesellschaft zu Magdeburg vom 2. bis 5. Oktober 1933," *Blätter für Deutsche Philosophie* 8 (1934/35): 65–70.

guarding a place for metaphysics. Here the Vienna Circle jumped into the fray with what its enemies characterized as a “vehement and well organized attack,” in which the Circle decried metaphysics as meaningless. Viewed from the right, the positivists “stood in the way” of the metaphysical concept of the world that was to underwrite the German worldview. Reichenbach blasted Driesch’s organicism as “mystical,” while Carnap denied that Driesch’s organicism was sufficiently lawlike to make it scientific. Schlick remained silent, but the next day he presented an entire lecture, “On the Concept of the Totality,” in which he claimed that while the distinction between totalities and aggregates might be linguistic or pragmatic, it was not a substantive distinction: there was no whole over and beyond the sum of parts.⁶⁶

For both sides, the debate over the totality concept [*Ganzheitsbegriff*] was crucial. Carnap, Reichenbach, and Schlick denied the idea of a transcendent reality to the *Deutschtum*, *Nation*, or *Volk* and so threatened to undermine central tenets of right-wing ideology. According to Schlick, in sociological as well as physical or biological systems, one could build up higher levels of organization from an adequate understanding of constituent individuals. There simply was nothing further left to add about the “totality” or “whole.” To the Nazis and their allies, individuals had to be more than isolated entities; they were members of “higher totalities” whose full existence and whose cultural and spiritual acts could be understood only insofar as they were embedded in a larger inheritance, including their genetic material.⁶⁷ Similarly with the Bauhaus: the Nazi press cited internationalist tendencies and attacked Bauhaus art as a “calculating construction” that sought to abstract pure color and form from the world. Such an enterprise reduced man to a “geometrical animal” and was utterly incapable of capturing the “German essence.”⁶⁸ On many counts, then, the Vienna Circle and Dessau Bauhaus’s vision of transparent construction was anathema to the Nazi movement; it cut any transcendent national purpose from the state, from architecture, and from nature.

Violence superseded argument. Neurath wrote desperately to Carnap: “Of the atrocities of devastation let’s not speak. *All* of my friends are either sitting still, or fired, or arrested or in flight. . . . A young friend is probably in the worst camp, others disappeared. Desperation. Misery. Bert Brecht came over, Brentano and others. Everyone’s getting out. We’re collecting money. And yet: working on. One knows where one stands and where one falls.”⁶⁹ Elsewhere Neu-

66. Joh. Gauter, “Der VIII. Internationale Philosophenkongress 1934 (vom 2.–7. September in Prag),” *Blätter für Deutsche Philosophie* 8 (1934/35): 437–48, esp. pp. 437–40.

67. *Ibid.*, pp. 440–41.

68. Peter Hahn, *Bauhaus Berlin: Auflösung 1932, Schliessung Berlin 1933, Bauhäusler und Drittes Reich* (Berlin, 1985), p. 124.

69. Neurath to Carnap, 6 Apr. 1933, CP, PASP, document 029-11-18.

rath recalled painfully, "If I think back, how many of those I knew have been killed? Rathenau, Landauer, and so on. . . . The four apocalyptic riders are in full form."⁷⁰ The same riders were now moving against the Circle's allies in the Dessau Bauhaus. For under Meyer the left-wing politics of the Bauhaus had sharpened, encountering in the process increasing trouble with the press and the town authorities. A group of students (about ten percent of the student body) formed a communist cell. The press reported, to a well-prepared opposition, that the students had even sung Russian revolutionary songs at a Carnival party in 1930. Under pressure both from outside the Bauhaus and from within, Meyer resigned later that year; his fall was catalyzed in part by charges that he had donated money to striking miners in the name of the school (*B*, pp. 190–91).

In his letter of protest and resignation to the mayor of Dessau, Meyer reiterated his accomplishments, among which was the extraordinary series of visitors he had drawn to the Bauhaus during his tenure. First on the list was Neurath; prominently displayed were the names of Carnap and Feigl. Moreover, support from the logical positivists was indicated not merely by their past presence; Neurath and Josef Frank authored a ringing denunciation of Meyer's removal from the directorship of the Bauhaus. In a clear reference to the participation of the Vienna Circle, they reminded their readers that Meyer had not only brought technical subjects to the Bauhaus, he had imported the more general scientific world-conception [*wissenschaftliche Weltauffassung*]. "In Meyer's view," Frank and Neurath emphasized, "only people with a fundamental understanding of societal phenomena and science would become architects." Such a scientific orientation was at one with politics: "He was an advance guard in the great struggle over the new form of life [*Lebensordnung*] of socialism. He was truly a thorn in the side of the reactionaries."⁷¹ Having already forged bonds based on a common internationalist and constructivist sense of modernity, the two movements were now brought even closer together by the common terms of their persecution under the Nazis.

Mies van der Rohe, as the new director of the Bauhaus, swung the school away from the Marxist, the sociological, and the functional toward the formal, the elegant, and the aesthetic. It was a last, desperate attempt to preserve the Bauhaus under the Nazis, whom van der Rohe hoped might eventually soften their stand against the school. But the Bauhaus teachers were resigning in droves, the Nazi party took control of the Dessau city parliament, and the Bauhaus now came under direct fire for their international style: the flat geometrical roof, for example, was obviously not right for the north. According to the

70. Neurath to Carnap, 13 Mar. 1933, CP, PASP, document 029-11-20.

71. Josef Frank and Neurath, "Hannes Meyer," *Der Klassenkampf: Sozialistische Politik und Wirtschaft* 3 (1930): 574–75.

Nazis, the modernist challenge to traditional roof design was a throwback to the “oriental” and “Jewish” “subtropical” regions (*B*, p. 195). After the Dessau Bauhaus was closed in October 1932, van der Rohe kept the institution alive for a few more months in Berlin.⁷² Pius Pahl, one of the Bauhaus students at the time, remembered that “‘the end came on 11 April 1933 during the first days of the summer term. Early in the morning police arrived with trucks and closed the Bauhaus. Bauhaus members without proper identification (and who had this?) were loaded on the trucks and taken away.’” The Bauhaus was dissolved on 10 August 1933 (*B*, p. 196).

“Hard times,” Neurath wrote Carnap in March 1933, “really hard times. And what will become of physicalism [Neurath’s doctrine of building up from simple elements of experience]? When will we be able to go from our foundation [*Unterbau*] to the superstructure [*Überbau*]? When?”⁷³

7. *The American Incarnation*

If the promised superstructure was ever made, it was in the Bauhaus’s fourth and last incarnation in the United States. Feigl left for America in 1930; Carnap followed suit, leaving Prague in 1936 and settling at the University of Chicago. Hans Hahn died in 1934, and in 1936 Schlick—already very alienated from Neurath on political, philosophical, and personal grounds—was murdered by a deranged student. For some years Neurath remained in The Hague, Holland, where his work on the International Foundation for Visual Education continued; and from there he continued to participate in work on the *Encyclopedia of Unified Science* and ISOTYPE. The rather unstable life he had constructed fell apart on 10 May 1940, when the fighting in Holland came within audible distance. On 13 May he could see the sky red over Rotterdam, and he, along with his collaborator and later wife Marie Reidemeister, joined a desperate group of refugees in a lifeboat headed for England.⁷⁴

But the modernist endeavor, a joint enterprise of the old Vienna Circle and the old Bauhaus, had already begun to reassemble with the cautious blessing of the University of Chicago under the direction of Moholy-Nagy. Moholy-Nagy had come from Hungary to Berlin after

72. On the last months of the Bauhaus under Mies van der Rohe, see Dearstyne, “Bauhaus Berlin—Bauhaus Finis,” *Inside the Bauhaus*, ed. David Spaeth (New York, 1986), pp. 239–55, and Spaeth, *Mies van der Rohe* (New York, 1985).

73. Neurath to Carnap, 13 Mar. 1933, CP, PASP, document 029-11-20.

74. On Neurath’s escape from the continent, see Marie Neurath’s account in *ES*, pp. 68–73.

World War I to absorb Germany's "highly developed technology" and began incorporating gears, wheels, and machinery into his art.⁷⁵ Soon, however, his interest in machines began to merge with a fascination with light and photography, and his belief that the different artistic media were all part of the same unity became a refrain in his work. In 1921 he came into contact with Hilberseimer and Gropius; two years later, Gropius invited Moholy-Nagy to the Weimar Bauhaus to teach, edit, and write. He remained there until his split with Meyer drove him out.

As events turned worse in Germany, Moholy-Nagy, the artist of all trades, left the Bauhaus for Amsterdam, then went from Amsterdam to London and then to Chicago. As part of his scientific vision of art, Moholy-Nagy recruited at least four members of the positivists' Unity of Science movement. Carnap himself occasionally lectured there, but it was Carnap's colleague and devotee of logical positivism, Charles Morris, who maintained the closest affiliation with the New Bauhaus.⁷⁶ Morris, a philosopher at the University of Chicago, had acted as an American clearinghouse for contact between Americans and the Vienna Circle throughout the 1930s. Indeed, Morris played a leading role in getting Carnap to the philosophy department at the University of Chicago. In addition, for several years Morris had been the most active American in the ambitious series of conferences the Circle ran on the Unity of Science, and was a coeditor (with Carnap and Neurath) of the successor journal to the Vienna Circle's *Erkenntnis*: the *International Encyclopedia for the Unity of Science*. To the New Bauhaus Morris also brought two scientist members of the Unity of Science movement, Carl Eckart (from physics) and Ralph Gerard (from biology).

In the 1937 Prospectus for the New Bauhaus, Morris recalled: "Moholy-Nagy knew of the interest of Rudolf Carnap and myself in the unity of science movement. He once remarked to us that his interest went a stage farther: his concern was with the unity of life."⁷⁷ Now

75. Lloyd C. Engelbrecht, "The Association of Arts and Industries: Background and Origins of the Bauhaus Movement in Chicago" (Ph.D. diss., University of Chicago, 1973), pp. 246-47.

76. *Ibid.*, p. 286. For more on the establishment of the New Bauhaus, see also William H. Jordy, "The Aftermath of the Bauhaus in America: Gropius, Mies, and Breuer," in *The Intellectual Migration*, pp. 485-543; *50 Jahre New Bauhaus: Bauhaus-Nachfolge in Chicago* (Berlin, 1987); and James Sloan Allen, "Marketing Modernism: Moholy-Nagy and the Bauhaus in America," *The Romance of Commerce and Culture: Capitalism, Modernism, and the Chicago-Aspen Crusade for Cultural Reform* (Chicago, 1983), pp. 35-75.

77. Morris, Prospectus for the New Bauhaus (hereafter abbreviated P), American School of Design, founded by the Association of Arts and Industries, p. 10, accession record 70-65 F65 in the Institute of Design Collection, The University Library, Special Collections Department, The University of Illinois at Chicago (hereafter ID/UIC). Morris to Lloyd Engelbrecht, 3 June 1968, ID/UIC.

Morris was ready to further this expanded sense of unity, embedding it within a new nationalistic framework to facilitate its reception in an often xenophobic late-1930s America. “The general program [of the New Bauhaus] accords with the deepest American insights and needs—the dovetailing of Bauhaus plans with Dewey’s *Art as Experience*.”⁷⁸

But whatever its similarity with American pragmatism, Morris continued the Vienna Circle’s preoccupation with the reduction of all utterances to protocol sentences. In the New Bauhaus prospectus he insisted that “we need desperately a simplified and purified language in which to talk about art . . . in the same simple and direct way in which we talk about the world in scientific terms. For the purposes of intellectual understanding art must be talked about in the language of scientific philosophy and not in the language of art” (P, p. 10). By expanding the program of the *Wissenschaftliche Weltauffassung* to include art itself, Morris, in a sense, had made the project of the *Aufbau* and of the Bauhaus one and the same. Both now would find a common ground and unity in the foundations of the protocol sentences.

Even the two movements’ ambition of producing a “new form of life” found resonance in Morris’s hope that the “mentality of the scientists” would be incorporated into that of the artist. Given such a scientific artistic formation, Morris surmised, “Presumably no future Keats will arise from the New Bauhaus to drink a toast to the confusion of Newton for having destroyed the beauty of the rainbow.” Rather it will be “the same man who seeks knowledge and a significant life, and it is the same world that is known and found significant. Art as the presentation of the significant and science as the quest for reliable knowledge are mutually supporting. Each supplies material for the other and each humanly enriches the other” (P, p. 10).

But there is another sense in which the two movements were “mutually supporting,” as Morris dubbed their relation. Each legitimated the other. For the *Bauhäusler*, the Vienna Circle stood for the solid ground of science, the power of technology and the machine age. As such it gave their artistic movement a credence beyond that of taste or style. For the logical positivists, their association with the larger world of modern art certified them as progressive, and identified them with the future in a world in which their philosophical prospects were dim and their ties with traditional philosophy weak.

As the curriculum of the New Bauhaus began to take shape with Moholy-Nagy’s backing, Morris fashioned his ideal of a unified course on art and science into a fundamental part of the New Bauhaus education program. In a course summary, prepared at the end of the first school year (1937–38), Morris reiterated his goals: “The treatment of

78. Morris, “The Intellectual Program of the New Bauhaus,” unpublished typescript, 1937, folder 87, ID/UIC.

science was based on the study of the interrelationship of the terms of the various sciences; the aim was to show the unity of science by showing how all the terms of the sciences can be stated progressively on the basis of a few terms drawn from the everyday language. . . . We are now discussing the question as to how far art can be regarded as a language."⁷⁹

It is in this context that Morris's published writing of the late 1930s should be understood. Above all, he hoped his course would, in his words, "give the verbal correlate of what, as I understand it, the Bauhaus is attempting to accomplish in practice."⁸⁰

8. Conclusion: *The Construction of Modernism*

Morris's course at the New Bauhaus serves well as a summary of my principal thesis: the modernist construction of form out of elemental geometric shapes and colors is a correlate of the verbal development of theories out of logic and elementary bits of perception. Both artist and philosopher fastened on the simple and the functional; both sought to unify disparate domains through a common foundation. But what linked logical positivism and the Bauhaus went beyond mere structural parallels. The two movements drew on a common set of scientific and machine-centered images; both called for their domains to be brought into accord with "modern methods of production." They were bound together through personal and familial relations, through Feigl's, Philipp Frank's, Reichenbach's, Carnap's, and Neurath's visits to the Dessau Bauhaus, through Josef Frank's collaboration with Neurath and his contribution to the Circle's lecture series, and through a complex process of mutual legitimation: the Vienna Circle bestowed an aura of scientificity on the Bauhaus and the Bauhaus conferred an image of progressivism and postwar reform on the Vienna Circle. If the Bauhäusler and logical positivists needed an external force to drive them even closer together, the anthroposophists and mystics did so in the beginning while the Nazis and nationalists served that purpose in the later period. In their common persecution, both movements rapidly became joined as heroes of internationalism and antifascism. By the time Moholy-Nagy set up the New Bauhaus in Chicago, it was overdetermined that he make common cause with the logical positivists in the creation of a scientifically and artistically modern form of life: logical positivism was in the form of life espoused by the Bauhaus, and the Bauhaus rationalization of the objects around us played a part in the form of life advocated by the logical positivists. Both were attempts to

79. Morris, "Intellectual Integration," unpublished typescript, n.d., F73-199; 1-2, ID/UIC.

80. *Ibid.*

interiorize an image of the machine world they saw on the outside, one through language, logic, and thought, the other through color, geometry, and architecture. Personal and collective forms of life would be reformed by the same means.

This process of interiorization took many forms, but above all the Bauhäusler and Vienna positivists of the late 1920s espoused a neutral stance modeled on their image of technology. Theirs was to be an *apolitical politics* (even when it was Marxist) predicated on organization, planning, and analysis. Here was ground on which Neurath could find common cause with the leaders of the Dessau Bauhaus. Similarly, Meyer and many of his colleagues pressed for an *unaesthetic aesthetics*, a move away from the decorative, historical, spiritual, or nationalistic toward the world of knowledge predicated only on a scientific orientation. Finally, the logical positivists urged a doctrine of an *unphilosophical philosophy*, a conception of the world of knowledge that would be predicated only on science. This triad of philosophy, politics, and aesthetics was grounded in a building up from clear, technical, first principles. Together these elements were supposed to form a joint enterprise; they were to be moments of the same drive toward a “modern” way of life, freed from ideology and grounded on a vision of the machine age, if not its reality.

If the left wings of the Dessau Bauhaus and the Vienna Circle made common cause in their espousal of a certain image of the machine and modernity, it does not mean that any commitment to machines and things technical was leftist, nor does it follow that the right-wing opposition was necessarily against technology. Quite the contrary. As Jeffrey Herf has argued eloquently in *Reactionary Modernism*, there were all manner of technology-embracing philosophies that glorified new means of transport, killing, and communication while denying reason an essential role in the conduct of individuals and society. What distinguished Carnap, Neurath, Meyer, Schmidt, and the other figures discussed here from right-wing technologists is the cultural significance they accorded technology. For the right, technology was part of a glorification of work, power, and domination. As one writer put it, technology was defined as the “mobilization of the world through the *Gestalt* of the worker,” where “in the *Gestalt* lies the whole, which encompasses more than the sum of its parts.” This whole meant that the symbols of technology—the hydroelectric dam, tanks, motorcycles—were to be considered as an inseparable part of a new authoritarian world order in which the technical was inseparable from the intentions and desires of the worker-soldier.⁸¹ Though right and left shared a

81. Jeffrey Herf, *Reactionary Modernism: Technology, Culture, and Politics in Weimar and the Third Reich* (Cambridge, 1984), pp. 101–8.

picture of modernity embodied in technology, nothing could be further from a transparent Bauhaus lamp or the quasi-axiomatic image of philosophy that Carnap presented in his *Aufbau*, in which every action had its visible purpose and function. Technology, like modernism more generally, was coveted ideological ground.

Looking back at this modernist ambition from the present, a time in which modernism is being reexamined, we can no longer take for granted claims of neutrality. It is clear that many of the Bauhaus products were infused with a style that was not only independent of pure function but often impeded function. Similarly, with each passing year in the late 1930s, the belief that a purely technical approach to social problems could avoid politics also began to falter. As fascists, communists, and Christian Democrats fought it out in the 1930s, there was no demilitarized zone left for social, artistic, or philosophical neutrality. Even the realm of philosophy held no privileged position of neutrality. In the United States and England, where logical positivism came to rest, metaphysics (and antimetaphysics) no longer carried the political weight they had in the German-speaking world of the 1920s and 1930s. Torn from those roots, the ideal of a philosophy without metaphysics seemed ever more elusive as the years passed.

For a brief time, however, Carnap's ideal of "a single life" of artistic and scientific dimensions seemed possible. It was the dream of a world where a rational engineer could fashion not only the basis of philosophy and architecture but of the way of life that went with them. By coupling the Vienna Circle to this larger cultural effort, the "modern" in "modern philosophy" gains a sense deeper than merely a discontent with what came earlier. In subsequent years, some scholars have identified logical positivism as the arch foe of a progressive and holistic postmodernism. Others have defended the older logical positivism as a last vestige of Enlightenment thought against an obscurantist right. My own view is that the search for new directions in the philosophy of science must be integrated with a cultural and historical reassessment, not only of the logical positivists but of the antipositivist philosophical movements in the mid-1960s. I suspect that such a reappraisal would situate the antipositivists as solidly within, not outside, the particular modernist tradition of their "opponents." An alternative to modernism in the history and philosophy of science would, it seems to me, need to confront science as a variegated set of scientific practices that mesh together without a privileged foundational level either in observation or in theoretical assumptions. The characterization would be avowedly contextual: each strand of instrumental, theoretical, or experimental practice would be embedded in a wider cultural world. In such a picture the strength of the scientific enterprise would come not by building up from a privileged "foundation," but by the intercalated

traditions of practice.⁸² But whatever route we take next in the philosophy of science, we can only benefit from understanding more deeply the now distant—but still compelling—modernism of 1929 Vienna.

82. The modernist vision of science endorsed by the logical positivists had a profound effect on the history of science written in the 1930s, 1940s, and early 1950s. For years, the history of science accepted the positivists' claim that knowledge was built up from neutral bricks: it was under the direct influence of the positivists' *Weltauffassung* that James Conant and his associates produced the Harvard Case Studies in Experimental Science in the 1940s, minimizing theory and making the history of experimentation the history of a decontextualized and transparent activity the historians thought of as "observation." When the reaction against logical positivism set in during the 1960s, the hierarchy was inverted but it remained hierarchical. Paul Feyerabend, Thomas Kuhn, and others set theory, not observation, as their *Grundelemente* and made observation reflect and codify the theoretical basis. Historians again followed suit, and one finds article after article in the 1960s and 1970s demonstrating the theory-ladenness of observation—and therefore the primacy of theory. For a discussion of these themes and some brief remarks on alternatives, see Peter Galison, "History, Philosophy, and the Central Metaphor," *Science in Context* 2 (1988): 197–212, and Galison, *How Experiments End* (Chicago, 1987).