Mapping the Modern City: Otto Neurath, the International Congress of Modern Architecture (CIAM), and the Politics of Information Design

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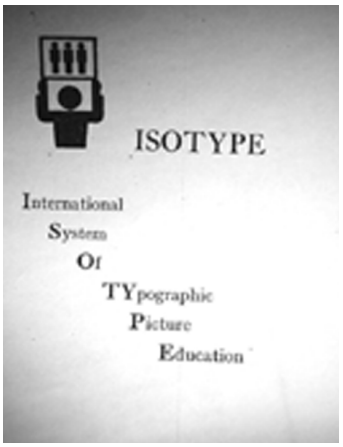

Figure 1
Otto Neurath, "ISOTYPE," 1936. Source: Otto Neurath, *International Picture Language* (Reading: University of Reading Department of Typography & Graphic Communication, 1936), 16

Otto Neurath was a social scientist, one of the most formidable, if controversial, intellectuals of the interwar period. A student of turn-of-the-century German sociology—the writings of Georg Simmel, Ferdinand Tönnies, and the Social Policy Association [*Verein für Sozialpolitik*]—he was a key player in the socialist uprisings in Munich in 1919, as well as Vienna's settlement movement during the early 1920s. In 1925, he gained funding from the Vienna municipality to open the Museum of Society and Economy, which still represents one of the most innovative cultural experiments of the twentieth century. The museum's mission was an unconventional one—to bring social and economic facts to the masses, raise the self-awareness of the working class, and break down modern capitalism's fetishization of the "object." It exhibited facts, not artifacts; the reproducible, the transparent, and the everyday rather than the rare, the curious, and the strange.

The Museum of Society and Economy was the very inverse of the Baroque *"Wunderkammer"* or "cabinet of wonder," because it was conceived as a conduit of information, literally a medium for the masses that sought to form as much as it informed the working class public. It offered a means of looking at the world that was rooted in what Neurath termed the "scientific world conception," the philosophy of scientific empiricism that attempted to dislodge metaphysics from everyday communication. The museum developed a new form of graphic representation known as the "Vienna Method of Pictorial Statistics" (later renamed the "International System of Typographic Education," or "ISOTYPE"), which attempted to popularize social and scientific facts through the use of pictorial graphics. It sought to furnish the public with a systematic "picture" or *"Bild"* of society in a fashion that was easily legible and readily reproducible. For Neurath, "reading" an ISOTYPE chart was as easy as counting, grouping, and measuring: "[R]eading a picture is like making observations with the eye in everyday experience: what we may say about a language picture is very like what we may say about other things seen by the eye. For example: the man has two legs; the picture-sign has two legs; but the word-sign 'man' has not two legs." [1] (figures 1, 2)

1 Otto Neurath, *International Picture Language* (Reading: University of Reading Department of Typography & Graphic Communication, 1980), 20.

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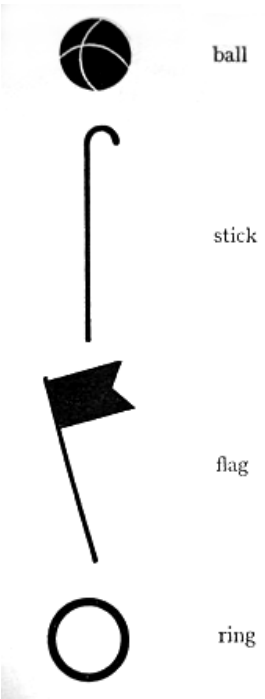
Figure 2
Otto Neurath, examples of ISOTYPEs, 1936. Source: Otto Neurath, *International Picture Language* (Reading: University of Reading Department of Typography & Graphic Communication, 1936), 16.



Town planning was one of the main arenas within which Neurath applied his graphic vocabulary. Throughout the 1920s, the City of Vienna aggressively sought to promote public housing and strategic urban planning initiatives as a means of stemming real estate speculation, consolidating physical control of the urban fabric, and ensuring the availability of affordable housing. Public education was central to this project in that it helped generate support for large-scale urban renewal initiatives, while popularizing the goals of centralized social planning. Vienna's Social Democrats believed that social transformation had to stem from the will of the people—that the shaping of everyday life (*"Lebensgestaltung"*) had to precede the shaping of the physical environment (*"Baugestaltung"*)– and Neurath's cultural practices were a product of this outlook. Although, as Helmut Gruber has observed, Neurath objected to the liberal cultural program of Austrian Social Democrats—a program of social indoctrination that heavily favored the written word over visual signs and symbols—he still held the view that social and political change had to occur hand in hand. Neurath believed that, in a socialist state, the intellectual and cultural socialization of the proletariat had to take place alongside—and, in many respects, prior to—the political and architectural transformation of daily life. In sharp contrast to the Stalinist line of reform, which stressed the centrality of heavy industry in the project of modernization, Neurath insisted that the long-term health of socialism could not be ensured without the tacit approval of the masses, and that only by challenging the traditions and values upon which the capitalist system was based could a truly socialist state be achieved. As Neurath put it rather tersely, "The general rationalization of the shaping of built form can only be possible within the context of the rationalization of life itself." [2]

As director of the Museum of Society and Economy, Neurath carried out a number of collaborations that exemplified this pedagogical approach to reform, including one with the International Town Planning Congress, which was the principal organ for the European Garden City movement, and later with the International Congress of Modern Architecture (CIAM). Since its founding in 1928, CIAM had been the leading voice for modernist architecture and urbanism, sponsoring a series of annual meetings that discussed topics ranging from public housing to rational site planning, and from minimum dwelling requirements to social and physical hygiene. Their proceedings were widely publicized, helping internationalize the goals of the *"Neues Bauen"* or "new building" movement in Europe. Their collaboration with Neurath, which spanned 1931 to 1935, was exceptional in that it represented the first systematic attempt at standardizing the language of urban planning on a transnational basis. It symbolized the "world conceived and grasped as picture," to use Martin Heiedegger's language, inaugurating the rise of statistically-based mapping methodologies and, more generally,

2 *Der Aufbau: Österreichische Monatshefte für Siedlung und Städtebau*1 (1926), 53–54. Unless otherwise noted, translations of all citations are by the author. To see the original German citations, contact the author at nv1@hotmail or visit: www.arch.columbia.edu/phd/vossoughian/mapping_the_modern city_pdf

a concept of knowledge in which abstract notions of wholeness and totality preceded—and in many ways *precluded*—any dialogue with the immediate physical world.[3] Although scholars have traditionally interpreted the "Functional City" debates and Neurath's involvement in them as a prelude to the publication of Le Corbusier's "Athen's Charter"—a document that delineated the four primary functions of the modern city—it also brought to the fore critical discussions about the *normification*[*normierung*] of culture, and its significance to artistic production. It highlighted the tension between formal and *informational* conceptions of urbanism, which is a rift that has become more evident today.

My analysis takes, as its point of departure, the German Building Exhibition of June 1931, which showcased recent innovations in the construction industry. It was here that Neurath met Cornelis van Eesteren who, at the time, was planning the 4th International CIAM Congress, a meeting that was loosely called the "Functional City," and was to be held in Moscow.[4] Like Neurath, van Eesteren had a strong interest in visual communication. In 1923, he produced a series of axonometric studies in collaboration with the Dutch artist Theo van Doesburg that appeared in the *Galerie de l'Effort Moderne* in Paris. These "counter-constructions" consisted of colored planar geometries suspended in space. They stressed a non-perspectival, abstract representation of architectonic form.[5] In 1924, van Eesteren participated in the publication of two *De Stijl* manifestos, "Towards a Plastic Architecture" [*Tot een beeldende architectuur*] and "Towards a Collective Construction" [*Vers une Construction Collective*]. In 1927, he became an instructor at the *Staatliche Bauhochschule* in Weimar, the successor to the Weimar Bauhaus, where he taught urban planning and design. A year later, he joined Amsterdam's Public Works Department, overseeing development of a series of expansion plans for the City of Amsterdam. It had been projected that, by the year 2000, Amsterdam would have approximately 1.1 million inhabitants, so Van Eesteren was asked to develop a scheme to accommodate for this vast expansion in a rational fashion.

During the Berlin Building Exhibition, van Eesteren invited Neurath to assist CIAM's exhibition committee in assembling materials for its "Functional City" Congress. For van Eesteren, the Congress was to constitute a collective and systematic look at thirty-four cities around the world, focusing on each area's social, economic, organizational, and functional character. It was to be a preliminary analytical study of the modern metropolis, laying the groundwork for future interventions. It stipulated relative uniformity between individual presentations, seeking to forge consensus between varying national delegations. It was inspired by van Eesteren's concept of "comparative city planning" [*vergleichende Städtebau*], which rested on the idea that the study of urban morphology gave the planner insight into the unchanging essence of the contemporary city. Following Theodoor

3 Martin Heidegger, "The Age of the World Picture" *in The Question Concerning Technology and Other Essays* (New York: Harper Torchbooks, 1977), 129.

4 For a background to Van Eesteren's life and work, see Franziska Bollerey, "Cornelis van Eesteren: A Close-up," *Urbanismo* 8 (1989). For a discussion of Van Eesteren's work at the Amsterdam Public Works Department, see Mariette van Straalen, "Empirical Urban Analysis: The Collaboration between Van Eesteren and Van Lohuizen," *Daidalos* 69/70 (1998/1999); Vincent Van Rossem, "Amsterdam's General Extension Plan," *Planning Amsterdam: Scenarios for Urban Development (1928–2003)* (Rotterdam: NAi Publishers, 2003). For a discussion of Van Eesteren's post-World War II impact, see Bart Lootsma, "Reality Bites: The Meaning of Research in the Second Modern Age," *Daidalos* 69–70 (1998–1999).

5 Regarding Van Eesteren's work with Van Doesburg, see Paul Overy, *De Stijl* (London: Thames and Hudson, 1991), 172–175.

van Loohuizen, with whom he collaborated in the Amsterdam Public Works Department,[6] as well as the Scott Patrick Geddes, who coined the adage "survey before plan," Van Eesteren insisted that scientifically juxtaposing patterns of growth and development, functional organization, geography, climate, history, society, and other such elements could help the student of urbanism identify points of weakness in the modern city, and locate areas needing reform.[7] This method assumed that all cities were built upon a series of *a priori* urbanistic "givens" (i.e., propositions that applied regardless of cultural or geographical context). It also suggested that cities essentially were organic, and that they could be analyzed as holistic units. In accordance with Le Corbusier's views about urbanism, it assumed, finally, that the modern city served four basic needs or "functions," namely housing, recreation, work, and transportation. As van Eesteren summarized his philosophy:

> In order to furnish a comprehensive view and to allow for comparison, there is a need to learn about ... similarly structured cities in other countries. This overview of the total development [*Gesamtentwicklung*] is gradually becoming a need of every architect and every population that seriously deals with problems of city planning. This project is rooted in the universal understanding of the world [*universale Auffassung*], which is very much connected to the development of architecture today. Until now, there were very weak approaches for achieving this kind of overview. If at all, one could ... achieve insight into the functions and conditions of life of various cities. For this area, of which we will give the name *comparative city planning* [author's emphasis], we need first an analysis of existing cities according to a unified method (according to identical methods, use of identical symbols, and identical colors for identical functions).[8]

By inviting Neurath, Van Eesteren hoped to capitalize on the former's close ties with the Soviet government. In 1931, the Museum of Society and Economy was invited to open a satellite museum in Moscow, which came to be known as the Isostat Institute. Moreover, Van Eesteren recognized that Neurath's pictorial and image-based system of communication could help universalize CIAM's goals and aspirations. Even though the majority of CIAM's members spoke either French or German, both of which were CIAM's official languages, they still lacked a standardized means of communicating their formal and programmatic concerns graphically. They recognized that the greatest obstacle to articulating their vision of the modern city was communicational, and not necessarily technical or economic in nature, and they saw in Neurath's Vienna Method of Pictorial Statistics a means by which to address and perhaps overcome this limitation.

6 See van Straalen. See also Volker Welter, *Biopolis: Patrick Geddes and the City of Life* (Cambridge: MIT Press, 2002).

7 Martin Steinmann, ed., *CIAM (Congres Internationaux d'Architecture Moderne): Dokumente 1928–1939* (Basel: Birkhauser, 1979), 114.

8 Cornelius van Eesteren, "Prospekt für die Funktionelle Stadt," Papers of Cornelis Van Eesteren, Netherlands Architecture Institute.

Between January and June of 1932, Neurath met regularly in Moscow with CIAM delegates. His circle of contacts included architects Peer Bücking, Hans Blumenfeld, Hans Schmidt, Fred Forbat, and Margarete Schütte-Lihotzky, all of whom had left central Europe for the Soviet Union around 1930 in the hope of helping to build the new Communist state. They shared Neurath's sociological understanding of the built environment, which was strictly anti-aesthetic and anti-formal in orientation. Being philosophical Marxists, they vigorously refuted the idea that modernism could be reduced to a "style." Following the lead of Schmidt who, through his journal *ABC* advocated a multidisciplinary conception of design—one that regarded empirical and scientific analysis as a precondition for design or planning—as well as Schütte-Lihotzky, who herself relied on the time-motion studies of F.W. Taylor in devising her residential kitchen designs, they were in agreement with Neurath's holistic belief that science and culture belonged to one and the same intellectual continuum. As Forbat remarked in a letter to Gropius:

> i hope that you are in possession of my letter of February 25, in which i reported about the first steps of the congress preparations. in the meantime, we have developed our suggestions exactly and set everything up so that the questionnaire has become superfluous. the working group consisted of schmidt, blumenfeld, Bücking, dr. neurath and me, once kaufmann was also there and twice mrs. schütte-lihotzky. it was not easy to put together the meetings; blumenfeld has been bedridden for 8 days with a lower leg fracture, Bücking is very busy and always cancels, schmidt suddenly went to siberia, the last two nights i have been alone with neurath and yesterday, at a collective meeting with the heads of three russian sub-committees (new cities, city reconstruction, regional planning) i was all of a sudden alone with frau wyss, since otherwise no one would come. i have learned that the russians at any rate will analyze three typical cities according to our methods provided that barcelona [where the next CIAM steering committee is to be held in March] confirms our requests.[9]

Later in 1932, Neurath made a series of visits to Amsterdam to see van Eesteren; he eventually published two articles in the latter's journal *De 8 en Opbouw*. In the light of these exchanges, however, van Eesteren was only partly receptive to what Neurath had to say. In his guidelines for the "Functional City" Congress, Van Eesteren stipulated that all participating countries produce photographs, texts, and maps of each city they analyzed, which suggests that he shared Neurath's emphasis on uniformity and graphic standardization.[10] He called for "aerial views of the characteristic elements of

9 I wish to thank Kees Somer for bringing this letter to my attention. Letter from Fred Forbat to Walter Gropius, March 8, 1932, Fred Forbat Papers, Stockholm, Sweden.

10 José Luis Sert had the following to say about the guidelines that Van Eesteren set for CIAM IV; the emphasis of course was on normalization and standardization: "The significance of [these] analytical stud[ies] [was] that ... for the first time, a universal basis for the comparison of cities was established. All plans were designed on the same scale, and interpreted by the same symbols, so that slum areas, traffic problems, concentrations of population, location of industry, and other phases of urban life in communities of widely differing character, and in different nations and continents, could really be compared." José Luis Sert, *Can Our Cities Survive?* (Cambridge: Harvard University Press, 1942), 6.

the city and its environment,"[11] and also asked for maps (three of them for each city in total) illustrating the four functions and their interactions in the city.

Van Eesteren and his Dutch colleagues produced and distributed three prototype maps of Amsterdam in order to clarify their intentions. Map I was produced at a scale of 1:10,000 (figure 3). It notated housing, recreation, and work zones, and the specific activities to which they were attached. In its right margin was a linear graph illustrating population growth since 1850. Like the first, Map II also was drawn at a scale of 1:10,000, but only showed transportation systems. To the side of the second map was a section that showed average street widths for primary and secondary roadways. It also contained a radial graph notating annual wind patterns. Map III, a regional map, was designed at a scale of 1:50,000, illustrating all four functions together, and stressing their relationship to outlying, nonurban areas.

For notational purposes, van Eesteren and his team created a legend made up of seventy-two symbols (figure 4). These clearly went against Neurath's graphic "instructions." More descriptive than analytical, they were designed with a level of detail and precision

11 "Internal Memorandum of the International Congress for Modern Architecture" (1931), Papers of Cornelis van Eesteren, Netherlands Architecture Institute.



Figure 3
Maps of Amsterdam at 1:10,000 scale by Dutch CIAM delegation; intended as prototype for the Functional City Congress. Source: *CIAM (Congres Internationaux d'Architecture Moderne): Dokumente 1928–1939*, Martin Steinmann, ed. (Basel: Birkhauser, 1979).

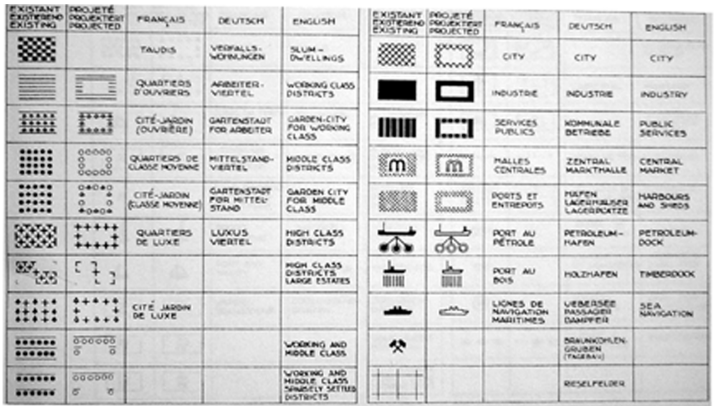


Figure 4
Graphic symbols intended for Functional City Congress. Source: *CIAM (Congres Internationaux d'Architecture Moderne): Dokumente 1928–1939*, Martin Steinmann, ed. (Basel: Birkhauser, 1979).







Figure 5
Cornelis van Eesteren presenting analytical maps of the City of Amsterdam to CIAM delegates. Source: Papers of CIAM, ETH Zurich, Zurich, Switzerland.

Figure 6
Sigfried Giedion speaking to Otto Neurath. Source: Papers of Cornelis van Eesteren, Netherlands Architecture Institute, Rotterdam, The Netherlands.

Figure 7
Neurath having a conversation with Alvar Aalto (center) and László Moholy-Nagy (right). Source: Papers of CIAM, ETH Zurich, Zurich Switzerland.

that defied Neurath's emphasis on simplicity and pedagogical clarity. They came in a great many shapes, sizes, and colors, and mostly included a combination thereof, which made them difficult to decipher unless one took the time to study the legend. The symbols were divided into two groups: one devoted to the "existing" city, and the other to the "projected" city. They notated a range of locations and functions: industrial areas, public services, central markets, harbors, sheds, and petroleum docks; slum dwellings, working-, middle-, and upper-class districts; woods, park areas, allotment gardens, playgrounds, swimming facilities, and yacht roods; and gardens, zoos, cemeteries, and train tracks. Graphically speaking, some of the signs were iconic in shape (i.e., a cemetery was represented by a cross; and woods were represented by trees), while others were more abstract. The more abstract symbols included a cruciform marking set against a pink background to represent upper-class areas, and brown-and-black checkerboards to indicate slums.

The "Functional City" Congress was held between July 29 and August 14, 1933. Earlier that year, it was moved from Moscow to Athens, because the Soviets had withdrawn their invitation. The first and the last three nights of the meeting took place aboard the SS *Patris II,* which set sail from Marseille. Guests included Sigfried Giedion, Rudolf Steiger, Werner Moser, Le Corbusier, Pierre Chareau, Fernand Léger, Charlotte Perriand, Wells Wintemute Coates, László Moholy-Nagy, van Eesteren, Giuseppe Terragni, José Luis Sert, Alvar Alto, Fred Forbat, Helena and Szymon Syrkus, and, of course, Neurath, who attended with his assistant and later wife, Marie Reidemeister (figure 5, 6, 7). Cities that were analyzed included Brussels, The Hague, Zurich, Barcelona, Dessau, Detroit, Warsaw, Madrid, Stockholm, Paris, Verona, Como, Oslo, Frankfurt, and Cologne.[12] For the most part, all of the presentations adhered to the requirements outlined by van Eesteren. There were two exceptions, both of which reflected internal ideological differences within CIAM itself. One exception was the maps by the Swiss delegation, which was headed by Rudolf Steiger. Steiger had a very strong interest in empirical research, as evidenced by traffic surveys he and his partner, Carl Hubacher, had conducted for a lakeside development competition in 1925. In Map I of Zurich, he included two sectional drawings that showed, both statistically and pictorially, population density figures in relation to both physical elevation and functional zone (figure 8). These were closely modeled after Neurath's graphic methods, not only in terms of the pictorial signs they used, but also in terms of how the information was organized. Each of the two graphics in the sectional drawings noted a different geographical topography, illustrating underneath the programs and population densities attached to each. In contrast to van Eesteren's prototype maps, they treated the city as both a statistical and physical entity, brilliantly juxtaposing quantitative and topographical forms of information.

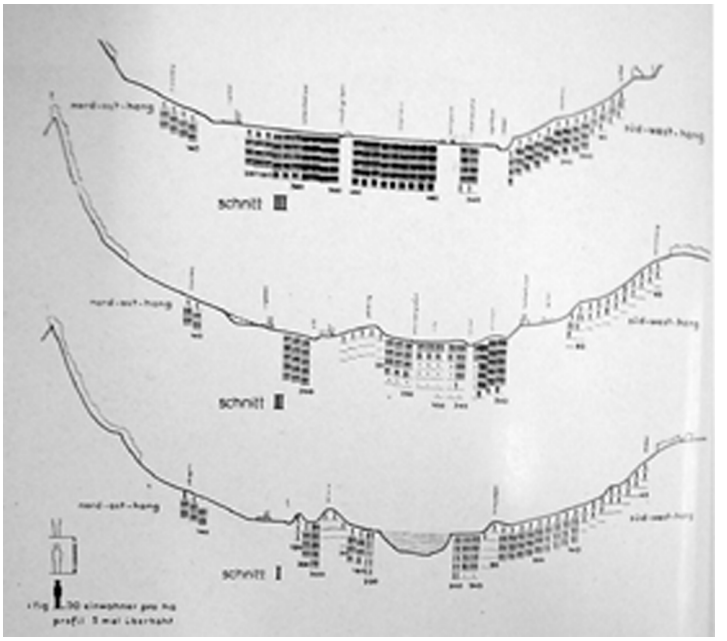


Figure 8
Swiss CIAM Delegation, Sectional view of population density in Zurich, 1933. Source: G.A.T.E.P.A.C. "Conclusiones del IV Congreso Internacional del C.I.R.P.A.C. sobre la Ciudad Funcional," *A.C.: Documentos des Actividad Contemporànea* 3:12 (1933): 12–42.

A second and even more pronounced exception among the presentations were the maps the Germans produced for the City of Dessau. In addition to the three primary maps that van Eesteren had asked for, this work included a meticulously documented "explanatory report" [*erklärender Bericht*] about Dessau's geological, climatological, historical, social, and economic composition in historical context (see figures 9 and 10). Graphically speaking, it included a combination of text, photographic montage, maps, and drawings. It was a radical departure from the other CIAM studies in that it emphasized Dessau's social and economic context over its programmatic or geographical composition. It was intended as a provocation in that it took issue with the very premises upon which the Congress had been organized. As Kees Somer has observed, the leftist radicals such as those belonging to the German CIAM delegation preferred using a "historic-materialistic research methodology that would reveal the factors in a city's actual development, and thus help them in the design of cities where socialist relationships would predominate."[13] This was in sharp contrast to Le Corbusier's and van Eesteren's approach to the urban fabric, which emphasized an ahistorical notion of physical planning and functional zoning.

When they arrived in Athens, the CIAM delegates were greeted by the Technical Chamber of Greece. On the evening of August 3, they convened in Greece's National Polytechnical University for an exhibition and opening reception hosted by Greece's Prime Minister. After initial introductions, van Eesteren, Giedion, Le Corbusier, and Neurath delivered individual presentations. In his talk, Van Eesteren underscored the benefits of using uniform graphic standards. His paper, entitled "Methods of

12 Mumford, *The CIAM Discourse on Urbanism, 1928–1960*, (Cambridge: MIT Press, 2000), 81.

13 Kees Somer, "Functional Amsterdam: The AUP and C.I.A.M.'s Fourth Congress," *Planning Amsterdam: Scenarios for Urban Development (1928–2003)* (Rotterdam: NAi Publishers, 2003).



Figure 9
German CIAM Delegation, Study of the City of Dessau, 1933. Source: Papers of Cornelis van Eesteren, Netherlands Architecture Institute, Rotterdam, The Netherlands.



Figure 10
German CIAM Delegation, Study of the City of Dessau, 1933.

Functional City Planning and Its Utilization in Amsterdam," made the point that standardized notational systems fostered collaboration and rational thinking: "Success cannot be achieved by a central office alone," he announced. "The central office can only issue the guidelines and decide whether they are being followed. The central office is like a scale that tries to achieve balance between the various interests of the planned area. Decentralization (of the decision-making process) can only lead to a harmonious totality if, in general, a city planning grasp exists among those who carry responsibilities for all that is executed and built."[14]

In his presentation, Neurath similarly stressed the importance of collaboration, but he also emphasized accessibility and visual transparency. His lecture, "Town Planning and Lot Division in Terms of Optical Representation Following the Vienna Method" [*L'Urbanisme et Le Lotissement du Sol en Representation optique d'Après la Methode Viennoise*],[15] was critical of the CIAM proposals and the Dutch delegation's instructions specifically for the fact that they gratuitously fetishized geographical and programmatic information, often at the spectator's expense. Although Neurath agreed with the spirit of cooperation suggested by van Eesteren's remarks, he was equally adamant about the ad hoc way in which his Vienna Method had been applied. "This is the first time that cities have been successfully displayed in a way that is designed in a uniform fash-

14 Cornelis van Eesteren, "Methoden des funktionellen Städtebaues und deren Anwendung in Amsterdam" (1933), Papers of Cornelis van Eesteren, Netherlands Architecture Institute, Rotterdam, The Netherlands.

15 A version of Neurath's paper was published in *Annales Techniques*. I have decided to use the original manuscript, however, which is located at the ETH in Zurich. See Otto Neurath, "L'Urbanisme et Le Lotissement du Sol en Representation optique d'Après la Methode Viennoise," *Annales Techniques* (1933), CIAM Papers, Eidgenössische Technische Hochschule (ETH), Zurich, Switzerland.

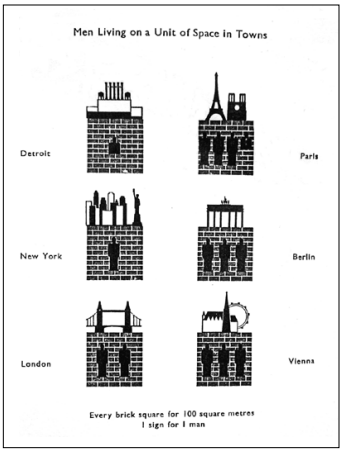


Figure 11
Museum of Society and Economy, "Men Living on a Unit of Space in Towns." Image included in Neurath's August 3, 1933 paper at "Functional City" CIAM congress in Athens. Source: Otto Neurath, *International Picture Language* (Reading: University of Reading Department of Typography & Graphic Communication, 1980), 54.

ion," Neurath began. "However, the signs that are employed do not appear to be complete. The abstractions that have been agreed upon are not eloquent enough for the public at large." Neurath went on show a number of slides that illustrated his criticisms more vividly. The first was entitled "Men Living on a Square Unit of Space in Towns," and highlighted the didactic intent of the Vienna Method (figure 11). According to Neurath, graphic information had to be legible at a cursory glance, that is, it had to be comprehensible to the casual observer. He insisted that CIAM follow suit in this regard:

> I present here the density of inhabitants in the great cities of the world. The cities are represented by the medallions, for example Paris by the Eiffel Tower and Notre Dame, London by the Thames Bridge, etc, etc. One sees in the squares brick and black figures. On first view one notices that in the Anglo-Saxon cities there are fewer inhabitations per 100 square meters than in Central Europe. I do not enter into considerations about knowing whether there is a dwelling with one or two floors determines this situation.[16]

For Neurath, only by deformalizing the language of urban planning could CIAM achieve its ideal of collective understanding. In his mind, *more* information did not necessarily mean *better* information. On the contrary, the most important objective was for the spectator to come away with an overall "picture" of the modern city, one which stressed the unified, interdependent, and indivisible character of the urban fabric. To quote Neurath, "I think that we could have better represented the quantity of studies done at this congress through similar schemas (to the ones I've shown) rather than through the plan and through geographical maps."[17]

In the days after his lecture, Neurath and the Congress delegates traveled through the islands of Greece, after which they reboarded the *Patris II* and made their way back to Marseille. On the return voyage, Jean Badovici, Le Corbusier, Rudolf Steiger, László Moholy-Nagy, and van Eesteren met to discuss plans for publishing the proceedings of the Congress.[18] Moholy-Nagy held a relatively favorable view of quantitative and empirical research methods in general, albeit with reservations. In 1922, he and his wife, Lucia, began experimenting intensely with photograms, a camera-less form of photography that involved projecting light onto a photosensitive surface.[19] In 1923, he took over as head of the preliminary course at the Bauhaus [*Vorkurs*] from Johannes Itten, steering the school in a direction that emphasized industrial mass production and a more practical engagement with social issues. During this period, he began a close friendship with Gropius and van Eesteren, developing a philosophy of design that rejected strictly utilitarian art as strongly as it did purely emotional, subjectivist works. As he wrote in a 1932 article, "We cannot establish a universal intellectual attitude or cultural standard from one vantage point only, such as cognition by

16 Neurath, "L'Urbanisme et Le Lotissement du Sol en Representation optique d'Après la Methode Viennoise."

17 Ibid.

18 Mumford, *The CIAM Discourse on Urbanism, 1928–1960*, 78.

19 Victor Margolin, *The Struggle for Utopia: Rodchenko, Lissitzky, Moholy-Nagy* (Chicago: University of Chicago Press, 1997), 139.

means of logic, or the sciences; nor indeed from the arts exclusively. In order to form a comprehensive attitude to existence, we must start *simultaneously* from emotion and cognition."[20] Moholy-Nagy was strenuously opposed to the sociological biases of Neurath, which he must have associated with the scientific empiricism of former Bauhaus Director Hannes Meyer. In 1928, Gropius appointed Meyer his successor in Dessau, prompting Moholy-Nagy's resignation from the school. In opposition to Meyer, Moholy-Nagy did not believe that aesthetics should be excluded from cultural practice; rather, the very function of design was to explore new forms of perception that defied scientific explanation. This tacit romanticism contrasted sharply with Neurath's radically anti-metaphysical outlook, which was very clearly derived from his conversations with the so-called "Vienna Circle." Throughout the 1920s, Neurath met regularly with Rudolf Carnap, Hans Hahn, Moritz Schlick, and other "scientific" philosophers with the hope of purging science of its metaphysical pretensions, and his views about visual communication echoed this standpoint. Although Neurath was never the foundationalist or positivist that many thought him—in fact, he was staunchly opposed to the idea that science could ever function as a self-enclosed "system"—he still was deeply skeptical of the ability for artistic production to serve socially progressive aims. Neurath's general distrust of the arts stirred controversy between him and the rest of CIAM, which can clearly be gleaned from a later correspondence. As van Eesteren remarked in a letter to Moholy-Nagy:

> I am truly happy that you participated in the congress, not only because you made a pretty film and took the pretty photos that we still plan to see, but above all because you participated so actively in the Congress events. This only proves that at our Congresses non-architects also need to participate. In particular, what has stayed in my mind is how intensely you debated Neurath—in which you, very correctly, always integrated the psychological and the human into the discussion; had you not, we would have definitely fallen victim to Neurath's rather limited system.[21]

Neurath returned to Vienna in the middle of August with a great deal of new responsibilities. Despite his differences with Moholy-Nagy (unfortunately, transcripts of the exchange do not exist), his Museum of Society and Economy was awarded the responsibility of editing the charts presented at the "Functional City" Congress, revising them, and assembling them for publication in two formats: a technical format for internal purposes and a more popular one for the general public. "[P]lans, statistics, photos (will be included)," Neurath commented. "Perhaps a few supplemental materials will be necessary."[22] "Everything should be as clear as possible," Van Eesteren responded. "The raw material must be published in the best possible manner .... Collaboration with Neurath's Institute is a

20 Laszlo Moholy-Nagy, "New Film Potentialities," *Moholy-Nagy,* Krisztina Passuth, ed. (London: Thames and Hudson, 1982), 320.

21 Letter from Cornelis van Eesteren to László Moholy-Nagy, September 4, 1933, Papers of CIAM (Congres Internationaux d'Architecture Moderne), Institut für Geschichte und Theorie der Architektur, ETH Zurich, Zurich, Switzerland.

22 "Minutes of Meeting of CIAM IV's Publications Committee" (1933), Papers of Cornelis van Eesteren, Netherlands Architecture Institute, Rotterdam, The Netherlands.

matter of trust. Naturally, the Congress must be kept informed and be allowed still to exert control."[23] On August 19, Neurath wrote to Giedion about the possibility of receiving the Congress's "resolutions" [*Feststellungen*]. This, of course, was in order to get the publication project underway. The resolutions were intended to represent a summation of the findings of the Congress, and be used to shape the course of the next meeting. "I would be grateful to you if I could receive the formulation of the new congress goals by Le Corbusier and the 'resolutions,'" Neurath wrote to Giedion. "We must quickly revise the symbols for the *new* and *old* work. This depends upon the questionnaires with whose help we can hopefully determine what the next congress will expect of us."[24] Neurath enclosed with the letter copies of the Museum of Society and Economy's 1933 publication *Pictorial Statistics According to the Vienna Method in Schools* [*Bildstastistik nach der Wiener Methode in der Schule*], as well as issues from *Distance Learning* [*Fernunterricht*]. He stated that he was interested in meeting with Moholy-Nagy in order to further discuss plans for the *Functional City* book. He writes, "[E]nclosed I send to you and your wife a new publication of ours, as well as a couple of issues of our periodical. Perhaps I will also include something about the congress in it as well. When will we be able to meet with Moholy? The type of layout is important. An agreement to connect 'romantic' and 'classical' elements."[25]

By September, Neurath still was awaiting the arrival of materials for the book. Van Eesteren wrote to Neurath that many of the resolutions' finer points were still being debated: "[A]s you suspected, the congress resolutions have generated still a great amount of debate."[26] Over the course of the fall, Neurath grew more impatient. He sensed (correctly, it seems) that CIAM was seeking to distance itself from him. He wrote to Le Corbusier in November: "I regret very much that as a member of this committee I have still not heard about the deadline and work plans .... This is all the more [disappointing] because relations between Vienna and the congress have become unusually loose."[27]

By the start of 1934, Neurath's work with CIAM was placed on hold. This was due, first, to the rise of Fascism and Nazism in Austria and Germany which, in 1933, caused the decline of the Austrian Social Democratic Party, and in 1934, prompted the closing of the Museum of Society and Economy, as well as Neurath's exile to The Hague. Second, for most of 1934 Van Eesteren was left bedridden and unable to work on account of nervous exhaustion and overwork. Third, from 1934 until his death in 1945, Neurath found himself increasingly involved in the organizational and administrative activities of the Unity of Science movement, which was the successor to the Vienna Circle. As Friedrich Stadler has observed, the Unity of Science's stated goal was to support cooperation and collaboration within the sciences and promote anti-metaphysical empiricism.[28] Throughout its history, it held seven major congresses,

23 Ibid.

24 Letter from Otto Neurath to Siegfried Giedion, August 19, 1933, Papers of CIAM (Congres Internationaux d'Architecture Moderne), Institut für Geschichte und Theorie der Architektur, ETH Zurich, Zurich, Switzerland.

25 Ibid.

26 Letter from Cornelis van Eesteren to Otto Neurath, September, 1933, Haarlem, Wiener Kreis Stichting.

27 Letter from Otto Neurath to Le Corbusier, November 24, 1933, Papers of CIAM (Congres Internationaux d'Architecture Moderne), Institut für Geschichte und Theorie der Architektur, ETH Zurich, Switzerland.

28 Friedrich Stadler, *The Vienna Circle: Studies in the Origins, Development, and Influence of Logical Empiricism* (Vienna and New York: Springer, 2001), 356.

a preliminary meeting in Prague followed by annual international meetings in Paris (1935 and 1937), Copenhagen (1936), Cambridge, England (1938), Harvard University (1939), and the University of Chicago (1941). Aside from Neurath, its principal organizers were Carnap and Philipp Frank, both of whom were in Prague, but later emigrated to the United States. Its members included many of the original members of the Vienna Circle—Edgar Zilsel, Moritz Schlick, Hans Reichenbach, et al.—as well as many new figures from outside of Austria and Germany, for example Charles W. Morris, Alfred Tarski, Bertrand Russell, Karl Popper, and Alfred J. Ayer.[29]

For Neurath, the project of unified science meant promoting scientific learning in the encyclopedic tradition of Denis Diderot and Jean Le Rond D'Alembert. It was an attempt to bridge the gap between high science and everyday life, much as the Museum of Society and Economy had sought to achieve in Vienna. It also meant decentralizing the production and consumption of social and economic facts. "After the deactivation of traditional metaphysics," Neurath announced, "in constant struggle with metaphysical tendencies, as positive work we could create an *encyclopedic* summary of the sciences upon a unified logical foundation."[30] By Neurath's account, the original *Encyclopédie* (1745–1772) had been inspired by the idea that knowledge should be accessible, collectively conceived, and open-ended; used as a tool for progressive social change. The Unity of Science followed in this tradition in that it was premised on the idea that "ambiguity and uncertainty are essential."[31] "All of science is always fundamentally subject to debate," Neurath wrote.[32] In 1936, Neurath initiated plans to produce an *International Encyclopedia for Unified Science,* which was intended as a multi-volume compendium containing two introductory volumes devoted to the foundations of unified science; a second series of monographs dealing with methodological questions with regard to unified science; a third series that surveyed the "the actual state of systematization within the special sciences, and the connections which obtained between them."[33] A fourth series would consist of a "comprehensive 'Visual Thesaurus,' [...] which would be a *Weltübersicht in Bildern* [World Overview in Pictures]."[34] In total, the project was to consist of some thirty-six volumes published in English, French, and German, and include contributors from all over the world. Only the first two introductory volumes, the monographs devoted to the foundations of unified science, were ever released.

Neurath resumed contact with CIAM in the fall of 1934. By that time, van Eesteren was carrying out three projects: an exhibition featuring a General Extension Plan that he had produced for the City of Amsterdam, a four-day CIAM delegation meeting, and a "Functional City" exhibition. The last two events were to open together at Amsterdam's *Stedelijk Museum.* For the "Functional City" exhibition, which was officially called "Housing, Recreation, Traffic, and Work in the Modern City" [*Wonen, werken, verkeer en ontspanning*

29 For a full list of the list of members of the Unity of Science movement and the contributions they made over the course of the movement's history, see Friedrich Stadler, *The Vienna Circle: Studies in the Origins, Development, and Influence of Logical Empiricism,* 350– 393.

30 Neurath, "Einheit der Wissenschaft als Aufgabe," *Gesammelte philosophische und methodologische Schriften,* vol. 2, Rudolf Haller and Heiner Rutte, eds. (Vienna: Hölder-Pichler-Tempsky, 1981), 625–626. Originally published in Erkenntnis 5 (1935): 16–22.

31 Neurath, "Einheit der Wissenschaft als Aufgabe," 626.

32 Ibid, 16–22.

33 Charles Morris, *Empiricism and Sociology,* Marie Neurath and Robert Cohen, eds. (Dordrecht: Reidel, 1973), 66–67.

34 Ibid, 67.

in de hedendaagse stad], van Eesteren wanted to include: the analytical maps that the delegates had presented aboard the *Patris II*, a second display that addressed universal signs and symbols in urban planning, and a third that visualized the resolutions of the "Functional City" meeting in graphic terms. He charged Mart Stam, the radical Marxist and Constructivist who had only recently returned from Moscow, with curating the exhibition. He asked Wilhelm Hess, Georg Schmidt, and Rudolf Steiger to produce a "visualization" of the resolutions, which also was known as the "historical table" [*historische Tabelle*]. He asked Neurath to oversee work on the historical table, and to devise a set of prototype universal symbols for urban planning that could be included in the exhibition. As Van Eesteren wrote to Neurath:

> The intention is to hold a [CIAM] delegation meeting, as well as to bring together Dutch city planning and housing professionals .... I write you this because I hope that we can then get our work on the representation of city planning symbols far enough that we can include them in the exhibition. It will be essential for us to test, revise, and ultimately apply our entire body of symbols on a map of Amsterdam so that a complete example can be made available .... I would be very pleased if our collaboration really gave rise to a symbolic language of city planning.[35]

The next months were frustrating for Neurath. In an echo of their debates aboard the *Patris II,* he and van Eesteren exchanged sharply contrasting views about what the exhibition was to accomplish, and how its contents were to be documented. Neurath's criticisms of the existing diagrams were many: "[W]e stress that at the exhibition it is better to include fewer large maps with smaller helping maps than to have too many large and overfilled maps. Wherever possible, no numbers should be used on the maps, because this disturbs the optical picture and sometimes even obscures the essential meaning."[36] Neurath also took issue with what appeared to be van Eesteren's disregard for his graphic expertise. As he wrote to van Eesteren on February 20, 1935:

> [E]verything gets resolved, eventually, once you have had the time to think about it, but [visualizing the city] is not a graphic task, nor is it simply a task to be left for architects; it requires the "shifting between" of the TRANSFORMATION, that is, the pictoral-pedagogical analysis and the orientation. To the remark that the architect has not time for such things, I answer with the following advice: he should not use his time for such things, but rather leave it to trained specialists. This, however, is the same old story that I have been hoeing and hawing about on various occasions."[37]

35 Letter from Cornelis van Eesteren to Otto Neurath, November 21, 1934, Wiener Kreis Stichting, Haarlem, The Netherlands.

36 Letter from Otto Neurath to Cornelis van Eesteren, February 2, 1935, Wiener Kreis Stichting, Haarlem, The Netherlands.

37 Letter from Otto Neurath to Cornelis van Eesteren, February 2, 1935, Wiener Kreis Stichting, Haarlem, The Netherlands.

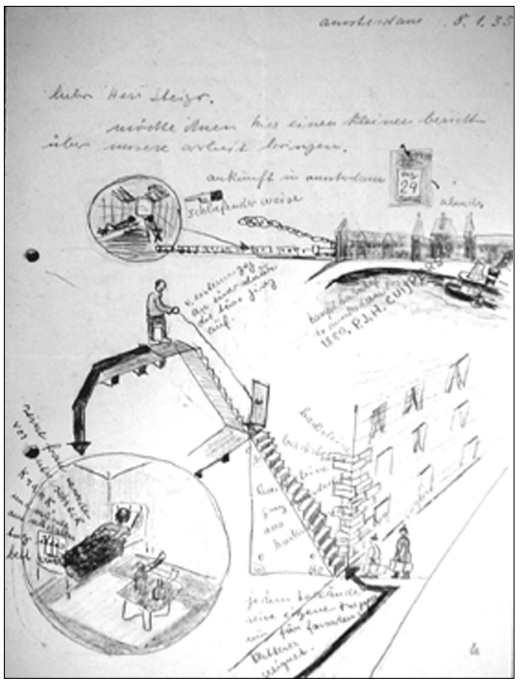
The one responsibility that generated some enthusiasm for Neurath was the work with Hess and Steiger. "Hess was here with me today," Neurath reported on February 6. "It was a great pleasure for me to see through this work. The entire setup is definitely very lively and appropriate for wider audiences."[38] Hess also was pleased with the collaboration. In a letter to Steiger, he produced a hilarious visual narration that suggested his strong affinity for Neurath's Vienna Method. Hess drew a picture of himself arriving at the Amsterdam train station, en route to meeting Van Eesteren on December 29. In typical Neurathian fashion, he illustrated the room in which he stayed, where he ate, and whom he visited (figures 12 and 13).

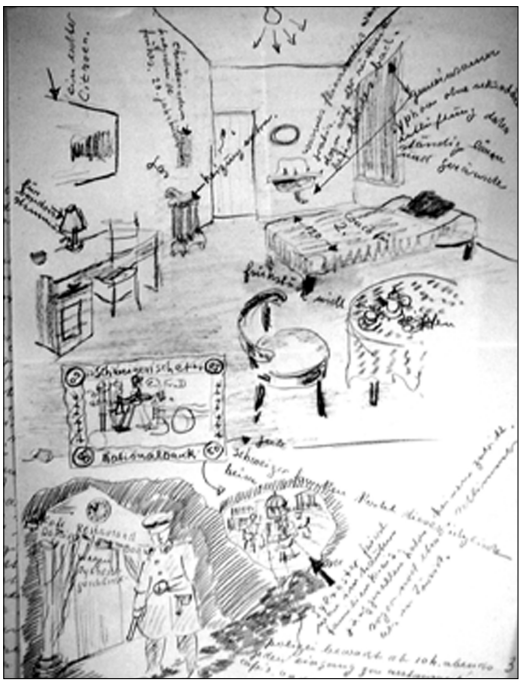
Physically, Steiger's and Hess's historical table was approximately five meters long (figures 14 and 15). It was divided into five separate sections, each of which was devoted to a different historical epoch. Unlike the other "Functional City" studies, it was not at all a geographical map, but a timeline, collage, and photo-documentation wrapped up into one. It showed the evolution of the modern city from the prehistoric age to the present. Conceptually, the table differed from Neurath's ISOTYPE diagrams in that it played to the audience's emotions in an effort to stir conversation and reflection. It created dramatic juxtapositions between New York skyscrapers and modern-day soldiers; it drew together maps, charts, sketches, and statistics in a collage-like fashion that strongly recalled German Dadaist art. "The highest horizontal column," Rudolf Steiger later wrote, "shows a selection of typical settlements from the European region from the cave and the era of primitive peoples to town and city models of the Middle Ages, the Renaissance, and the baroque

38 Letter from Otto Neurath to Cornelis van Eesteren, February 6, 1935, Wiener Kreis Stichting, Haarlem, The Netherlands

Figure 12
Wilhelm Hess, January 8, 1933 letter to Rudolf Steiger. Source: Papers of CIAM, ETH Zurich, Zurich, Switzerland.

Figure 13
Wilhelm Hess, January 8, 1933 letter to Rudolf Steiger. Source: Papers of CIAM, ETH Zurich, Zurich, Switzerland.





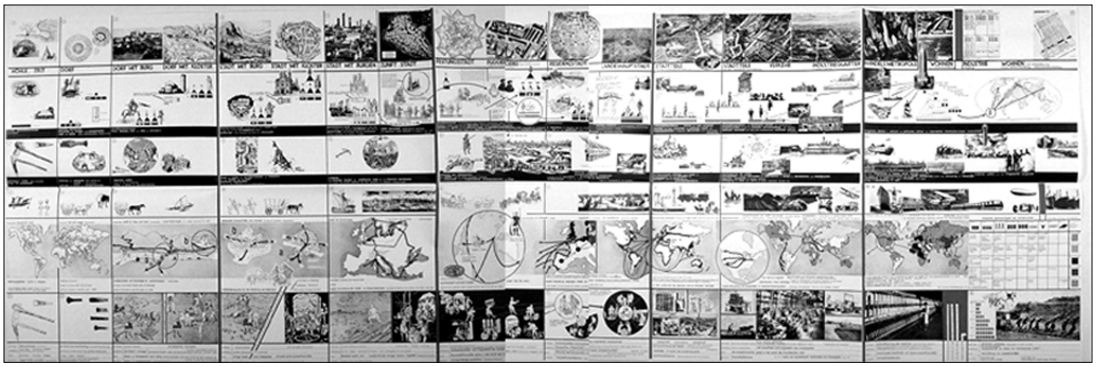


Figure 14
The "Historical Table" by Rudolf Steiger, Wilhelm Hess, and Georg Schmidt. Source: *CIAM (Congres Internationaux d'Architecture Moderne): Dokumente 1928–1939,* Martin Steinmann, ed. (Basel: Birkhauser, 1979).



Figure 15
Wilhelm Hess and Rudolf Steiger, with Georg Schmidt, "Historical Table" ("Historische Tabelle") detail view visualization of the four functions. Source: Papers of Cornelis van Eesteren, Netherlands Architecture Institute, Rotterdam, The Netherlands.

times through to the modern world city."[39] The chart included information about transportation systems, geographical conditions, economic and social systems, housing, social structures, and military technology. It showed the evolution of the four functions with respect to zoning conditions, historical development, and class relations. It illustrated how politics, law, industry, and media coalesced in the trade-based metropolis to "achieve political influence over the organized wage-earning workers." Its polemical intent and tacit anticapitalism was underscored by Steiger's later comments: one of the aims of the diagram, he stated, was to show how modern cities "dominate the world economy through organized finance capitalism."[40]

The "Functional City" exhibition was held June 1–23, 1935 (figure 16). The historical table was the center of attention, generating immediate controversy. It was hung against a central partition in the middle of the exhibition hall, only to be taken down after a single day. As Martin Steinman observes, its removal was primarily "due to pressure from Gropius, who regarded its materialistic

39 Rudolf Steiger, "Versuch einer graphischen Darstellung der historischen Entwicklung des Siedlungs- und Städtebaus," *CIAM (Congres Internationaux d'Architecture Moderne): Dokumente 1928–1939,* Martin Steinmann, ed. (Basel: Birkhauser, 1979).

40 Ibid.



Figure 16
Poster for the Functional City exhibition at the Stedelijk Museum in Amsterdam. (Source: Papers of Cornelis van Eesteren, Netherlands Architecture Institute).

foundations as politically dangerous."[41] The concept of the city that Steiger and Hess were offering, and that Neurath partly endorsed, was unacceptable because it questioned the economic foundations of the modern metropolis, attempting to historicize the city dialectically and materially. Its socialistic overtones risked politicizing CIAM in a way that could have put its livelihood in danger, especially among Nazi and extreme right-wing sympathizers.

It is unclear whether Neurath attended the opening of the "Functional City" exhibition. We do know that neither the graphic symbols he produced nor the prototype map he had been working on were included. His influence continued to be felt, however, in 1942 when José Luis Sert published the proceedings of CIAM IV in his *Can Our Cities Survive?* Van Eesteren also continued to follow the progress of Neurath's career, purchasing a Dutch-language copy of his *Modern Man in the Making* in 1940. Nonetheless, personal ties were all but discontinued after 1935. What caused this break? Enrico Chapel claims that Neurath's problems with CIAM are attributable to the fact that "the architects were absolutists .... Architects wanted to use [Neurath's graphic methods] for propagandistic purposes."[42] For all the many merits of his article, Chapel's reading fails to account for some of their deeper philosophical differences. Most significantly, Moholy-Nagy, Giedion, Le Corbusier, and Van Eesteren espoused a conception of culture that was decisively at odds with Neurath's. Over the course of the late 1920s and early 1930s, they grew skeptical of the utilitarian premises that informed modernist architectural discourse during the 1920s. Their optimism about science diminished as the promise of social democracy grew increasingly remote and, in many respects, their "return to form" and emotion in the 1930s and '40s was the product of their deepening skepticism about modernity at large. The rejection of Le Corbusier's Palace of the Soviets proposal in 1931, followed by the Russians' withdrawal of their invitation to host CIAM IV in 1932, caused many to rethink the scientific optimism that was widely felt during the early 1920s.

For Neurath, the promise of "unified science" remained a palpable ideal in spite of the growing pessimism and conservatism that surrounded him. In Moholy-Nagy's cultural humanism he saw signs of a resurgent metaphysic that played against goals of scientific inquiry. As Neurath later wrote, "Bauhaus and many others were strongly fashion-driven—but perhaps we are of another time .... In Berlin, everything was so principled, so dramatic, but often backed up by little, if any, action."[43] In the realm of graphic design, Neurath's emphasis on pedagogical clarity and accessibility was a reflection of his deeper distaste for autonomous art objects—concepts premised on ideas about authorship and originality. For him, the only "picture" or "*Bild*" worth communicating was the one whose content was intellectually transparent. CIAM and Neurath overlapped in their recognition that the internationalization of the "new building" movement was forcing architects to

41 *CIAM (Congres Internationaux d'Architecture Moderne): Dokumente 1928–1939,* Martin Steinmann, ed., (Basel: Birkhauser, 1979).

42 Enrico Chapel, "Otto Neurath and the CIAM—The *International Pictorial Language* as a Notational System for Town Planning," *Encyclopedia and Utopia: The Life and Work of Otto Neurath (1882–1945),* Elisabeth Nemeth and Friedrich Stadler, eds. (Dordrecht: Kluwer, 1996), 175.

43 Letter from Otto Neurath to Josef Frank, April 7, 1940, Papers of Otto and Marie Neurath, Österreichische Nationalbibliothek, Vienna, Austria.

rethink the terms by which design problems were to be addressed. But while notables such as Giedion, Le Corbusier, and van Eesteren insisted upon treating social and economic problems in formal and spatial terms, Neurath raised the possibility that the city also could be investigated by strictly quantitative and logical means. For him, the globalization of economic and social relations meant also the end of "the auratic," that is, the enlightenment-based concept of the autonomous, transcendental, and irreproducible art object that Walter Benjamin discusses in his "Work of Art in the Age of Mechanical Reproduction."[44] While Van Eesteren's planning philosophy combined aspects of regionalism and universalism, stressing both the commonalities between cities and the geo-spatial conditions that differentiate them, Neurath proposed a vision of urban space defined by and through "commodification"—the *commodification* of social and economic resources, the *quantification* of everyday life, and the *standardization* of graphic signs and symbols. He inaugurated a design concept that brought into crisis the very terms by which we traditionally visualized functionalist urbanism, as well as how we conceived of knowledge at large. That is, if Van Eesteren saw the Functional City maps as instruments with which to describe and depict physical phenomena, Neurath saw them as tools with which to convey a larger epistemic world view, vehicles that influence not just what we see, but also *how* we see. They offered him a means of popularizing unified science and the scientific world conception in general. They allowed him to privilege data over objects, and facts over artifacts, blurring the boundary between the abstract and the concrete in a way that would become only more pronounced as the century progressed.

44 See Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," *Illuminations,* Hannah Arendt, ed. (New York: Schocken Books, 1968), 217–252.

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