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Reading Isotype

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*International System Of TYpographic Picture Education

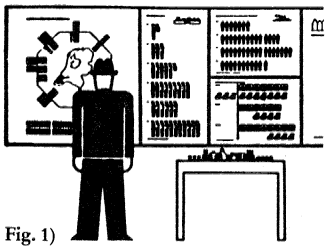

Fig. 1)

Isotype* was developed by the Viennese philosopher and social scientist Otto Neurath beginning in the 1920s. The system uses simplified pictures to convey social and economic information to a general public and has been applied to sociological museums and to books, posters, and pedagogical materials (figure 1). Neurath hoped to establish a global standard for education and to unite humanity through one ordered, universally readable language of vision. His concept was continued after World War II by graphic designers internationally;[1] Isotype's legacy includes both the design of statistical charts and the more generalized production of visual symbol sets, from travel signage to corporate identity marks.

Isotype expresses a theory of language that continues to inform much graphic design education and practice. This theory was formally articulated through Neurath's research as a logical positivist, and found practical expression in Isotype. Neurath believed that language is the medium of all knowledge: empirical facts are only available to the human mind through symbols. He saw verbal language, however, as a disfiguring medium for knowledge, because he believed its structure and vocabulary fail to be a consistent, logical model of objects and relations in the physical world. Neurath held that vision is the saving link between language and nature, and that, hence, pictorial signs would provide a universal bridge between symbolic, generic language and direct, empirical experience. Neurath's theory of the universality of vision articulated an attitude common to many members of the avant-garde and the post-World War II design disciplines. The search for a scientific and autonomous language of vision has led designers to focus on the formal aspects of images, such that they often treat abstract visual pattern-making as an independent system of communication. For example, many design theorists have attempted to define the "language of vision" as a set of formal contrasts that operate independently of cultural or verbal conditioning.[2] The focus on form has isolated visual communication from verbal communication by describing visual experience as if it functions outside of culturally and historically determined systems of

1) Designers who have developed the Isotype tradition include Rudolf Modley, who brought pictorial statistics to America after working with Neurath in Vienna. See Rudolf Modley, *Handbook of Pictorial Symbols* (New York: Dover, 1976). The industrial designer Henry Dreyfuss compiled the *Symbol Source Book: An Authoritative Guide to International Graphic Symbols* (New York: McGraw-Hill, 1972). Both Dreyfuss and Modley have essays in Gyorgy Kepes, ed., *Sign Image Symbol* (New York: George Braziller, 1966). Martin Krampen made a survey of the theory and practice of symbol design *Design Quarterly* 62, [1965]). *Print* magazine devoted an issue to international pictures (November/December, 1962), and Nigel Holmes has designed pictographic identity programs for ongoing news events. See Nigel Holmes, *Designing Pictorial Symbols* (New York: Watson-Guptill, 1985).

2) See Gyorgy Kepes, *Language of Vision* (Chicago: Paul Theobold, 1944); Rudolf Arnheim, *Art and Visual Perception* (Berkeley: University of California Press, 1954); and Donis Dondis, *A Primer of Visual Literacy* (Cambridge, MA: MIT Press, 1973).

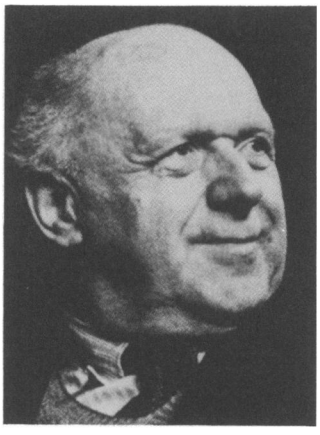

Fig. 2) Otto Neurath on December 21, 1945.

3) See Eckhart Gillen, "Von der Symbolischen Repräsentation zur Rekonstruction der Wirklichkeit. Das Verhaltnis von Bildstatistik bei Gerd Arntz," in *Politische Konstructivisten: Die "Gruppe Progressive Kunstler" Köln* (Berlin: Neue Gesellschaft für Bildende Kunst, 1975).

4) The Otto and Marie Neurath Collection, consisting of Isotype documents and publications, was deposited in the Reading University Library, Reading, England, in 1971. *Graphic Communication through ISOTYPE* (Reading, 1975) is an exhibition catalog that includes an extensive bibliography, and an essay, "The Significance of Isotype," by Michael Twyman, 7-17; the essay was also published in *Icographic*, 10 (1976): 3-10. Otto Neurath's *International Picture Language/Internationale Bildersprache* is available in a facsimile reprint of the 1936 English edition, with a German translation by Marie Neurath, ed. by Robin Kinross (Reading, 1980). Neurath's writings on Isotype, as well as essays on physics, economics, politics, sociology, and the philosophy of science, are collected in *Empiricism and Sociology*, Marie Neurath and Robert S. Cohen, eds., (Dordrecht, Holland: D. Reidel, 1973); this book also contains biographical and bibliographical material. Robin Kinross's "On the Influence of Isotype"

meaning. In this paper, a formal analysis of Isotype, *form* will be described not as self-evident sense data, but in terms of the cultural meaning and theoretical polemics attached to it.

Otto Neurath and logical positivism

Otto Neurath directed the Museum of War Economy in Leipzig (1918), the Museum of Town Planning in Vienna (1919-24), and the Social and Economic Museum, also in Vienna (1924-34). These innovative museums explained city policy to local citizens. In 1933, as political pressures forced Neurath to plan his departure from Austria, he established the International Foundation for Visual Education, at the Hague. The following year Neurath and his staff moved to Holland, where they worked until pressed to emigrate again in 1940. The Isotype Institute, directed by Otto and his wife, Marie (Reidemeister) Neurath, was established in London in 1942. The offices of the various Isotype organizations were staffed with researchers who gathered statistics and other information; with symbol designers who developed the Isotype vocabulary (chiefly Gerd Arntz); and with "transformers," who converted information into Isotype graphics.[3] Otto Neurath died in 1945, but the Isotype Institute continued to operate until Marie Neurath's retirement in 1972.[4]

In addition to developing Isotype, Otto Neurath helped found logical positivism, a philosophical theory formulated in the 1920s and 1930s by the "Vienna Circle," a group of philosophers that included Rudolf Carnap, Herbert Feigl, Hans Hahn, Viktor Kraft, and Friedrich Waismann, and was directed by Moritz Schlick.[5] Logical positivism brought together two philosophical attitudes that had previously been contradictory: rationalism, which studies reality through logic, geometry, and mathematics, rather than observation; and empiricism (or positivism), which claims that the only access to knowledge is through direct human observation. Vision is the classic source of empirical knowledge. Modern science had already combined rationalism and empiricism by transforming mathematics from metaphysics to method, from an autonomous system reflecting divine law or the inherent order of the mind to a tool for quantifying observable phenomena. Philosophy, however, continued to maintain an opposition between rationalist and empiricist theories of knowledge.[6]

The Vienna Circle extended the scientific method to philosophy by using logic, a traditional technique of rationalism, to analyze language. Symbolic logic, developed in the late nineteenth century by Giuseppe Peano and then Gottlob Frege, consists of a set of basic relationships, similar to the operations in arithmetic ($+$, $-$, $\times$, $=$). These terms are each given precise definitions and form a set of simple propositions from which complex statements can be built. The truth of any statement is referred back to the definitions which constitute the system, rather than to relationships and

objects in the physical world. The formulation "2 + 2 = 4" is *analytically* true, regardless of the objects being added, whether apples or angels. This analytical truth makes no claim to either physical or metaphysical reality, refering instead to relationships among abstract symbols.[7]

The Vienna Circle used symbolic logic to analyze language into a minimal set of direct experiences, represented algebraically. Logical positivism states that the terms of all languages – from physics to biology to the language of daily description – are reducible to a core of physical observations, such as "big," "small," "red," or "blue."[8] The aim of logical positivism was to identify basic observational terms underlying all languages. As Neurath wrote: "[E]ach statement that does not fit without contradiction into the total structure of laws must disappear; each statement that does not rely on formulations that relate to 'data' is empty, it is metaphysics . . . . all statements lie on one single plane and can be combined, like all parts from a workshop that supplies machine parts."[9] Logical positivism correlated the terms of a purely abstract system with units of direct experience, attempting to analyze language into a consistent and logical mirror of nature.[10]

The logical positivists' "mirror of nature" contrasts with the linguistic theory developed by Ferdinand de Saussure in the late nineteenth century, which describes the structure of language as fundamentally independent of any structure of nature. Saussure taught that the significance of any sign is produced solely by its relations with other signs, and not by its correspondence with material objects: the sign, taken by itself, is empty. Both the level of meaning (the ideas and objects which language represents), and the level of form (the visible or audible material of language), are systems of differences. The meanings of the pronoun "I" include *not-you, not-she, not-he*, and also *not-me* and *not-my*. In Saussure's proposed science of semiology, verbal language was the embracing model for all other modes of communication, including iconic signs, which resemble the objects they represent.[11] Whereas Saussurian linguistics influenced some branches of the artistic avant-garde,[12] the positivist tradition has powerfully influenced the modern design disciplines.

The language picture

Isotype is a popular version of logical positivism. An Isotype character is *positive* because, as a picture, it claims a base in observation; it is *logical* because it concentrates experienced detail into a schematic, repeatable sign. Neurath likened Isotype to a scientific theory: "The analysis of snapshot materials – photographs, films, models, stuffed or living animals, engines – suggests the creation of more and more observation statements with all their multiplicity, full of whimsicalities which may be unimportant today but important tomorrow. From these observation statements the

(Information Design Journal, 1981, II/2, 122-130) discusses the reception of Isotype. "The Eclipse of a Universal Man: Otto Neurath" is a short essay on Neurath and the context in which he worked, by William M. Johnston, in *The Austrian Mind: An Intellectual and Social History, 1848-1938* (Berkeley: University of California Press, 1972), 192-195.

5) Peter Halfpenny, *Positivism and Sociology: Explaining Social Life* (London: George Allen and Unwin, 1982), 46.

6) Charles Morris, "Scientific Empiricism," in Otto Neurath, et al., eds., *Encyclopedia of Unified Science* (Chicago: University of Chicago Press, 1938), 64.

7) Halfpenny, *Positivism and Sociology*, 48-49.

8) Rudolf Carnap, "Logical Foundations of the Unified Science," in *Encyclopedia of Unified Science*, 50.

9) Neurath, "Empirical Sociology: The Scientific Content of History and Political Economy," in *Empiricism and Sociology*, 326. In this essay Neurath discusses his theory of "physicalism," which states that all sciences, including social sciences, are reducible to the vocabulary of physics.

10) Richard Rorty's critique of logical positivism centers on the notion of philosophy as "mirror of nature." Rather than construct universalizing systems, philosophy should act as a mediating discipline among intellectual dialects, it should embrace interpretation rather than scientific description. See Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton: Princeton University Press, 1979).

11) Ferdinand de Saussure, in Charles Bally, Albert Sechehaye, and Albert Riedlinger, eds., *Course in General Linguistics*, trans. Wade Baskin (New York: McGraw-Hill, 1959).

12) For a discussion of Saussurian linguistics and avant-garde poetics and typography, see Annette Michelson, "De Stijl, Its Other Face, Abstraction and Cacophony, or What Was the Matter with Hegel?," *October* 21 (Summer, 1982), 6-26.

scientist reaches his theories correlated with observation statements but distinguishable from them. Isotype aids are comparable with scientifically formulated statements."[13]

An Isotype character is similar to a scientific formula; it is a reduced and conventionalized scheme of direct experience. The picture, for Neurath, was an intrinsically neutral mode of expression: "Just through its neutrality, and its independence of separate languages, visual education is superior to word education."[14] The photograph, a mechanical record of optical data, would be the most neutral expression of all. An Isotype character formulates the undifferentiated, nonhierarchical detail of the photograph (figure 2) into a concise, repeatable, generalized scheme (figure 3). With Isotype, Neurath tried to combine the mechanical empiricism of photography with the abstract logic of diagrams.

Neurath felt that Isotype opened onto a realm of immediate experience, the autonomous realm of the visual: "a new world, comparable to our book and word world."[15] This new world was comparable to, but separate from, language. Isotype proposed a bridge between the arbitrary, constructed, and constantly changing world of verbal languages, and the natural, physical, transcultural ground of visual experience. The concept of vision as an autonomous and universal faculty of perception is central to Neurath's design and philosophy; it remains one of the deepest principles of modern design theory.

Neurath believed that a more egalitarian culture would arise out of an international program of visual education. By its universality, pictorial information would dissolve cultural differences. Despite the devastating effects of technology in World War I, Neurath had considerable faith in science to improve the material and intellectual life of humans. The new scientific order would be disseminated through the transparent medium of orderly icons, industrially produced for a mass audience. Neurath thus shared the convictions of many designers, artists, and architects who worked between the two World Wars. To the theorists of constructivism, de Stijl, and the Bauhaus, geometry held the promise of synthesizing art and technology, and offered a visual "language" that would exist independently of particular cultures. For example, Soviet constructivists saw angular abstraction as an international and revolutionary language; its potential to communicate across language barriers would have been particularly salient in the Soviet Union. Constructivist graphics often paired geometric and photographic imagery, both of which were considered universal and objective.[16]

Isotype exemplifies a project common to much modern art and design – the attempt to eclipse interpretation with perception, to replace reading with seeing. Interpretation involves intellectual confrontation with language and other cultural products. In the spirit of interpretation, meaning is not an innate quality of forms

13) Neurath, "From *Vienna Method* to *ISOTYPE*," in *Empiricism and Sociology*, 240.

14) Neurath, "From *Vienna Method* to *ISOTYPE*," 217.

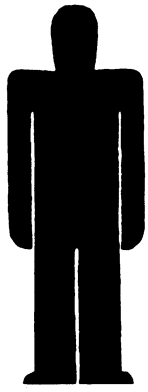

Fig. 3)

15) Neurath, "From *Vienna Method* to *ISOTYPE*," 224.

16) See El Lissitzky's 1922 essay "New Russian Art," which discusses the universality of geometric signs and defines abstract art as a catalyst for the production of useful objects: "new form . . . gives birth to other forms which are totally functional." In Sophie Lissitzky-Kuppers, *El Lissitzky: Life, Letters, Texts* (London: Thames and Hudson, 1968). Not all avant-garde artists heralded the scientific worldview. For a reading of surrealism as a critique of modernist design, see "Design in the Environment," in Jean Baudrillard, *For a Critique of the Political Economy of the Sign* (St. Louis: Telos Press, 1981). According to Baudrillard, Bauhaus design tried to achieve for domestic production what positivism had tried to achieve for language, namely, a closed system of objects correlated with a closed system of functions.

or an automatic reaction of the brain; it is discovered by relating signs to one's own personal and cultural experience, and to other signs. Images take meaning from stylistic and iconic conventions, from other images, and from words, as well as from natural objects. To interpret is to recognize that signs are not absolute, neutral, and fixed, but are, rather, in historical flux.

Perception, on the other hand, describes experience in terms of conditioned reactions of the body and brain. Esthetics based on Gestalt psychology constitute the most influential and primary modern design theory. This theory implies a universal ground for artistic judgment, based on unchanging structures of the mind and brain. Gestalt esthetics makes of abstract "elemental" form a transhistorical foundation which unites man in spite of changing cultural references.[17] As people concerned with the visual, artists and designers tend to focus on perception at the expense of interpretation.

17) See Arnheim, Kepes, and Dondis (cited in note 2).

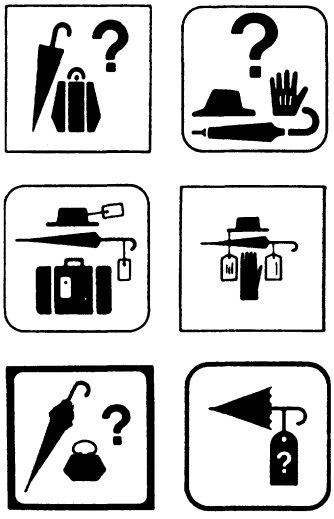

Fig. 4)

International pictures demand interpretation; they must be read. A pictogram functions by connecting with the culturally bound expectations of the people using it. It does not have an automatic, natural link to its object, but rather uses a figurative image as the starting point in a chain of associations. The signs in figure 4 all come from different tourist information signage systems. These drawings of gloves, handbags, and umbrellas are not pictures of particular objects, but rather stand for general classes of objects. Their generic status is signaled by their style, which also makes them read as public information rather than advertisements or decorations. Next, these signs, because they represent typical items that are lost, together become a sign for lost objects in general. Finally, the concept of lost objects stands for the office in an institution where such items can be retrieved. As with other cryptic messages, once the rationale behind a sign has been unlocked, it becomes memorable. The act of deciphering, the act of interpreting, is a pleasurable, memory-enforcing process.[18]

Pictorial statistics

As Robin Kinross has noted, the influence of Isotype can be broken loosely into two areas. The first is the deployment of Isotype characters in charts, which are primarily statistical; the second is the design of the symbols themselves.[19] Neurath called his central method of information design *pictorial statistics*: "only quantitative facts are socially significant, but most people are afraid of rows of figures . . . . So we see men and women, wage earners and employees, marching over the page in simple, clear, colored, contrasted symbols."[20] In a given chart, one sign stands for a fixed quantity. These groupings allow instant, visual comparison, remembered as an overall configuration. The charts usually have several variables. For example, figure 5 shows a similarity in the development over time, as France and Germany begin with a rela-

18) This "chain" of associations has been ideally analyzed into a narrative here; the actual use of a sign would never involve such an articulated sequence. This technique of describing the function of signs comes from Roland Barthes, who described signification as a chain of substitution in which a first sign, often an image, becomes the material vehicle for a second sign, which in turn becomes the vehicle of yet another sign. See "Myth Today," in Roland Barthes, *Mythologies*, trans. Annette Lavers (New York: Hill and Wang, 1957, 1972). A similar chain of substitutions is described in Peirce's theory of semiotic, in which a sign always refers to yet another sign, ad infinitum, and never to the object "in itself." See Charles Peirce, *Collected Papers*, Vol. II (Cambridge: Belknap Press of Harvard University, 1941, 1960).

19) Kinross, "On the Influence of Isotype."

20) Neurath, "From *Vienna Method* to *ISOTYPE*," 222.

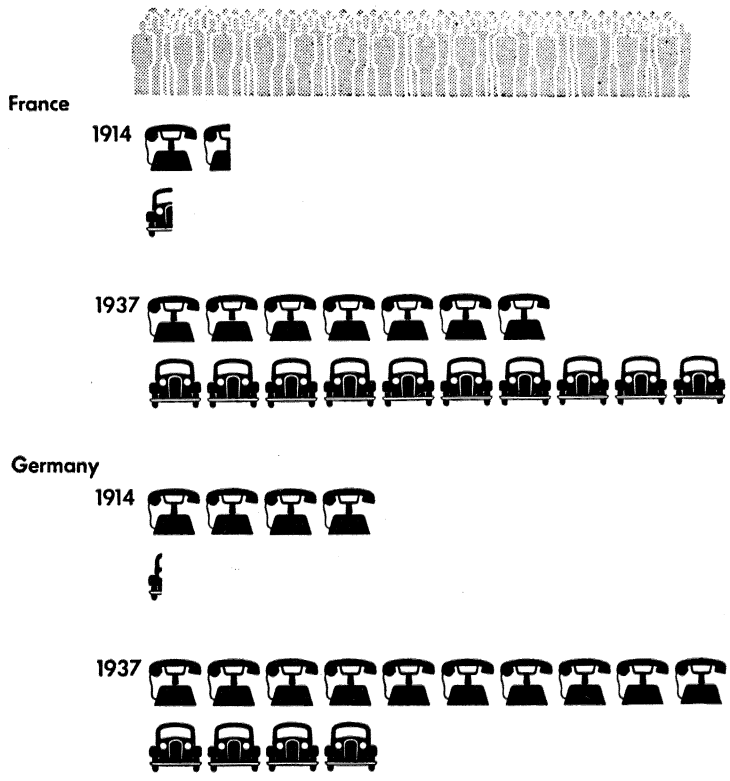

Fig. 5)

tively small quantity of telephones and automobiles; a geographic comparison shows a difference in the products' distribution. An Isotype chart substitutes literal figures for abstract numbers, exchanging exactitude for a memorable image. Isotype brings numbers to life by replacing them with pictures, and each picture is insured an objective, scientific status because it stands for a number.[21]

In the terminology of semiotics, Isotype figures are both icons and indexes.[22] An *icon* is a sign whose form is analogous to the object it represents, such as a perspective drawing or a map. An *index* is a sign linked to its object by virtue of proximity or direct physical contact. Some examples of indexes are a footprint, an image in a mirror, or a photograph. A statistical tabulation is an index of empirical observations; a population curve, for example, is a shape produced by the information it describes, not an invented image. An Isotype character is thus doubly bound to empirical reality. As an icon, it is purportedly grounded by physical resemblance rather than cultural convention. As an index, it is generated by numerical data.

Neurath saw statistics as "positive" and value-free. He wrote that sociology must limit its study to objectively measurable behavior: "Sociology on a materialist basis . . . knows only of such behavior of men that one can observe and 'photograph' scientifically."[23] Statistics were for Neurath such a photographic

21) Although "pictorial statistics" is the most systematic application of Isotype, Neurath used it in other ways as well. For example, Neurath's public information campaign for the National Tuberculosis Association uses Isotype characters to diagram the exchange of disease (New York, 1939). *Basic by Isotype* uses Isotype to identify vocabulary words in C. K. Ogden's "Basic English," a simplified grammar for international use. See Otto Neurath, *Basic by Isotype* (London: Kegan Paul, 1936). Neurath's *International Picture Language* advocates Isotype travel signage, which is perhaps its most popular use today. See Otto Neurath, *International Picture Language* (Reading, 1980).

22) The American philosopher Charles Morris, who worked with the Vienna Circle, promoted a theory of semiotic, based on the work of C. S. Peirce, which develops the categories of icon, index, and symbol. See Charles Morris, *Foundations of the Theory of Signs*, part of the *International Encyclopedia of Unified Science*.

23) Neurath, "Empirical Sociology," 361.

method; they were neutral indexes of social fact. Yet statistics are always gathered and used in a context of interpretation and argument. Since the development of statistical methods in the nineteenth century, both positivist and antipositivist sociologists have debated their objectivity and usefulness.[24] When transferred from the discourse of professional sociology to a popular text like Neurath's *Modern Man in the Making*, a history book written for a general audience, statistics block any shadow of empiricist doubt. When set in a textbook or a newspaper, statistics resist the skepticism on which empirical method is founded, and project an authoritative image of self-evident factuality. Advertising continually relies on the scientific authority of statistics ("four out of five doctors recommend . . ."); the numbers arranged by an information designer may be less blatantly persuasive, but nonetheless arise from a motivated context. In Marie Neurath's description of an Isotype campaign designed for the Soviet Union in the late 1920s, the Russians "were interested in the representation of statistics, as everybody is who is proud of progress."[25] Statistics promote the objectivity of numbers while suppressing an interest in explanation.

The visual "Gestalt" configuration of an Isotype chart represents masses of data that have a supposedly objective, self-evident relationship to each other. A meaningful interpretation of the data is supposed to stem automatically from the numbers themselves. Like figure 5, the example in figure 6 is from Neurath's *Modern Man in the Making*. The juxtaposition of data implies a causal link between the two visually similar profiles, although the accompanying text is intentionally vague, in that it merely enumerates the social developments indexed by the charts, drawing few interpretive conclusions. Because the charts stand for numbers, Neurath believed they would inspire purely objective, rational readings, as if the figures offered up nature itself: his "picture/text style . . . should enable anybody to walk through the modern world . . . and see it as he may see a landscape with its hills and plains, woods and meadows."[26]

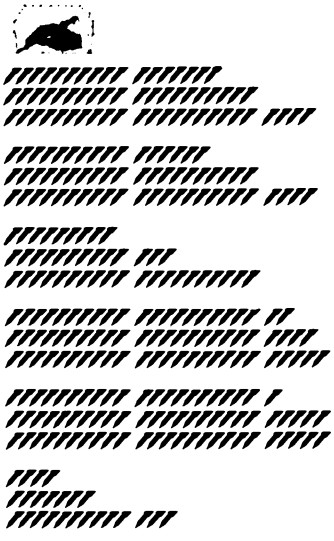

Fig. 6)

Pictorial signs

Isotype charts are built with Isotype characters. Neurath's writing suggests two central rules for generating the vocabulary of international pictures: *reduction*, for determining the style of individual signs; and *consistency*, for giving a group of signs the appearance of a coherent system. These rules have both explicit, practical functions and implicit, rhetorical functions. These constructive rules project an image of empirical, scientific objectivity; they also reinforce the "language quality" of picture signs, making individual signs look more like letters, and groups of signs look more like complete, self-sufficient languages.

Reduction means finding the simplest expression of an object.

24) See Halfpenny, Chapter 2, for a brief history of sociological statistics. For a description of sociology that demands the integration of empirical statistics into larger theoretical interpretations, see the Frankfurt Institute for Social Research, *Aspects of Sociology*, preface by Max Horkheimer and Theodor Adorno, trans. John Viertel (Boston: Beacon Press, 1956, 1972).

25) Marie Neurath, "Memories of Otto Neurath," in *Empiricism and Sociology*, 61.

26) Otto Neurath, *Modern Man in the Making* (New York: Alfred A. Knopf, 1939), 7.



Fig. 7)

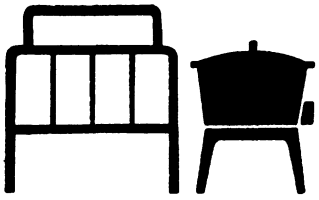

Fig. 8)

It is not meant to stylize the retinal image, but implies the operation of logical, mechanical principles. The international picture appears to be the necessary result of mechanized production and scientific method. Reduction does not actually strengthen the relationship between the picture and object it represents; it can even weaken that relationship by making pictures that are too geometric to be easily read. The implicit, *rhetorical* function of reduction is to suggest that the image has a natural, scientific relationship to its object, as if it were a natural, necessary essence rather than a culturally learned sign.

The silhouette is a central technique of reduction (figure 7). Silhouette drawing is a kind of pre-chemical photography that emulates the shadow, which is an indexical image made without human intervention, a natural cast rather than a cultural interpretation. International pictures suggest a rationalized theater of shadows, in which signs are necessary geometric formulae cast by material things – Plato's cave renovated into an empiricist laboratory.[27]

Flatness suggests a factual honesty, as opposed to the illusionism of perspective drawing. Isotype characters pull the shape of an object onto the ideal flat plane of a draftsman's drawing: They are blueprints of language (figure 8). The sign is simultaneously present to the eye, without imitative distortion.

When depth is expressed in Isotype graphics, isometry is used instead of linear perspective. In isometric drawing, parallel lines do not converge; dimension is fixed from foreground to background (figure 9). Isotype rationalizes the retinal by translating distorted sense material into a logical scheme. An isometric drawing describes what we "know" to be true, based on observation. Neurath was impressed by children's drawings, believing them to express naive, natural, and thus universal perception. Children, he wrote, do not use perspective. They are able to draw an object from all sides at once, and represent an entire forest with a single tree: "Isotype is an elaborate application of the main features of these drawings."[28]

The elimination of both perspective and interior detail heightens the alphabetic quality of international pictures. As in writing, the size, scale, or position of a given sign relative to other signs is not meant to be interpreted spatially, as a view of physical objects in a related scale. The image in figure 10 does not represent gigantic telephones or tiny cars; the size similarity is arbitrary and does not depict literal physical relationships. The signs are unified in terms of other signs, like letters in a typeface, rather than in terms of the objects they picture.

Reduction was also a principle for many other designers who were contemporaries of Neurath. From household objects to alphabets, formal reduction was linked with mass production. The sans serif typeface Futura was designed by Paul Renner

27) The sign as geometric shadow of reality is both a rhetorical connotation and a practical technique for many symbol designers. Martin Krampen suggested "simplified realism;" he urged designers to "start from silhouette photographs of objects . . . and then by subtraction . . . obtain silhouette pictographs." See Martin Krampen, "Signs and Symbols in Graphic Communication," *Design Quarterly* 62 (1965), 17. Statistics were used to select postures for the Munich Olympic Games signage: "The most significant action stages of the particular disciplines were found empirically by researching sports photo archives: the most significant stages were the ones most often shown." From Heiner Jacob and Masaru Katzumie, "Sign Systems for International Events," *Print*, (November/December 1969): 40.

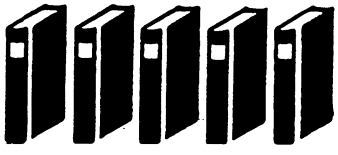

Fig. 9) Examples of Isotype graphics which use isometry to indicate depth.

28) Neurath, "From *Vienna Method* to *ISOTYPE*," 237.



Fig. 10)

ABCDEFGHI
WXYZ 1234
abcdefghijk

Fig. 11)

29) Twyman, "The Significance of Isotype," 13.

30) See Gillian Naylor, *The Bauhaus Reassessed: Sources and Design Theory* (New York: E. P. Dutton, 1985), 125.

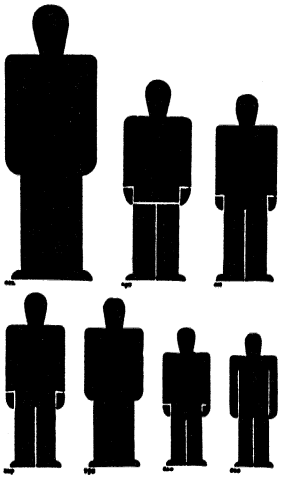

Fig. 12)

31) Neurath, "From *Vienna Method* to *ISOTYPE*," 246.

around 1926-27 (figure 11), and Neurath adopted it for all Isotype graphics.[29] In the twentieth century, sans serif typefaces have expressed the machine age: Traditional references to handicraft are stripped from the essential, geometric core of the alphabet. At the Bauhaus in Dessau, Walter Gropius encouraged the design of essential "types" for domestic objects, based on the demands of industrial production and laws of abstract form.[30] "Machine esthetics" conceived of technology as clean, logical, transparent, free of redundancy, similar to the overall model of language built by the logical positivists – language as a machine for living in.

By eliminating the details, reduction gives an image a generic status. A pictogram stands for no object in particular. An Isotype character has features common to a varied class of objects. Its particular referent shifts with its use in a given instance, like the referent of an indexical sign. Its alphabetic look enforces its generality. As a flat, simple silhouette, a pictogram reads as a sign rather than a literal depiction. It is recognized as a temporary, reusable substitute for an actual object. Neurath tied the generic tone of Isotype to political internationalism and scientific progress. Isotype graphics represented the subordination of individual and national interests to the needs of an international community.

Few people today read Neurath's original intentions in international picture signs. Like many genres of modern design, the signs have been thoroughly integrated into corporate and bureaucratic identity programs. Retained in their style, however, is the look of factuality, nonconventionality, self-evidence. We now recognize that international pictures affirm the naturalness of public and quasi-public institutions, from government offices to tourist bureaus to corporations.

Consistency refers to the stylistic uniformity of a set of signs and to the standardized use of signs, allowing them to become conventional in a particular community of people. Isotype is based on a concept of universal legibility; at the same time, Neurath knew that unless Isotype was instituted as an official international standard, numerous other picture languages would enter the environment, as indeed they have: "There is no advantage to having more than one visual language; change in language does not increase the richness of the visual store . . . . Isotype experience teaches us that consistency of visual education is possible, that the same techniques of visualization can be used at all levels . . . and in all departments of scientific arguing."[31] Isotype itself, though, is not consistent (figure 12), having been developed over a period of 25 years in an environment of design collaboration as well as political and economic chaos. Neurath often had a large staff, its size peaking at around 25 in the late 1920s and early 1930s, in Vienna. Wartime political pressures forced him to relocate several times, the result being changes in staff and loss of documents. His *Symbol Dictionary*, which contains hundreds of pages and

thousands of symbols, was compiled between 1928 and 1940.[32] Isotype itself, in fact, could not have been consistent, because it was a huge sprawling experiment. Yet it pioneered consistency, through example and through Neurath's theoretical writings.

Neurath extended the principle of consistency to include the design of the architecture and graphics surrounding Isotype: "Even the furniture of the exhibition is to serve the Museum's purpose only and not to detract by sentimental or monumental effects . . . . By subdivisions and additions, a number of basic sizes of charts were found which can always be fitted together . . . all lettering is of the same printed type."[33] Thus Neurath suggested that a single visual system be extended to the environment at large. This is the central principle of "identity design," pioneered by Peter Behrens in the early twentieth century, at the AEG in Berlin.[34] The identity program became a major design service after World War II; it often centers around a logo mark, either abstract or pictorial. A corporate identity program is the visual "language" of a corporation, a consistent grammar and a vocabulary controlling the deployment of type and symbols, from invoices to architecture. An identity program projects the image of the corporation as a vast, coordinated machine with its own logical and natural mechanisms.

Practically, stylistic consistency unites a group of signs dispersed throughout an environment. Establishing a consistent way of grouping signs in a series of charts, or in a park or airport, allows users to learn to read them and to deduce from context what is not immediately understood. When consistent rules have been set, their occasional violation is then understood as meaningful. Consistency also simplifies the design process.

And rhetorically, stylistic consistency gives the effect of an ordered, self-sufficient "language." The repetition of line weights, shapes, boldness, and detail suggests the presence of a logically developed system, a uniform language of visual forms. This "language" is a stylistic matrix laid over a group of icons. This code does not control the basic semantic or syntactic workings of picture signs; that is, it does not control the ability of picture signs to enter one's broader linguistic repertoire. The semantic value of a picture sign is tied to its being a picture, not to its style. The same object could be represented by a photograph or a painting or an elaborate style. Stylistic consistency works semantically at the level of connotation, not denotation (projecting an image of grammatical coherence rather than functioning as a logical, linguistic rule). Consistency helps a set of pictures read as signs, as information markers rather than ornaments.

The sign system for the Munich Olympics of 1972 exemplifies the principle of consistency (figure 13). As in the Tokyo system of 1964 (figure 14), each sport is represented by a figure drawing. But whereas the Tokyo figures are drawn to order, the Munich signs

32) The Isotype Symbol Dictionary is part of the Otto and Marie Neurath Collection at the University of Reading in Reading, England.

33) Neurath, "From *Vienna Method* to *ISOTYPE*," 217.

34) See Alan Windsor, *Peter Behrens, Architect and Designer* (New York: Whitney Library of Design, 1981).



Fig. 13) Munich, 1972

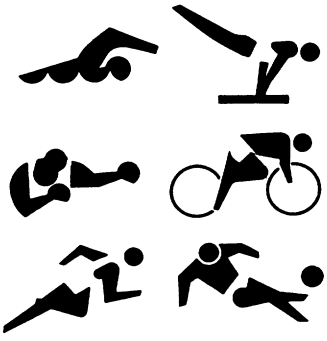

Fig. 14) Tokyo, 1964

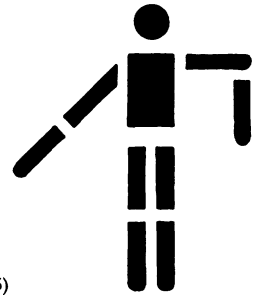

Fig. 15)

are generated by a consistent "body alphabet" (figure 15). This matrix, though visually systematic, does not constitute an actual grammatical rule. One could put together a motley but legible set of symbols from a variety of picture alphabets. The legibility of the Munich pictures does not absolutely depend on the consistency of the body alphabet, as consistency is a rhetorical, stylistic device, rather than a necessary and independent syntax. The sign system prepared for the U. S. Department of Transportation by the American Institute of Graphic Arts is another exemplar of stylistic consistency (figure 16).



Fig. 16)



Fig. 17)

When compound signs are built out of simple signs, the connection is compositional, rather than actually grammatical. Pictures are associated by simple virtue of proximity. In the tourist information signs shown in figure 17, all taken from different picture sets, the position of the telephone is inconsequential, circling the hotel like a moon. Just as size relationships between signs are not meant to be read literally, neither are most compositional groupings in international picture languages.

In the twentieth century there have been several efforts to design logically articulated picture languages from which sentences can be built, including semantography (or "Blissymbolics"), promoted by Charles Bliss from the 1940s through the 1970s (figure 18). Semantography is a collection of 100 symbols, each consisting of a "few schematized lines which faintly indicate the outline of things."[35] Hundreds of compound signs are built from this core, and syntactic markers allow each icon to function in three modes: thing, action, or human evaluation. Bliss wrote that semantography can translate any interpretive or metaphoric statement into quantifying, physical terms.[36] He called semantography a microscope and telescope for thinking. The person literate in semantography is no longer a reader, but an observer; Bliss's language is an instrument for examining empirical reality. Although semantography aimed for universality, it is a highly abstract code whose pictorial element is almost gratuitous.

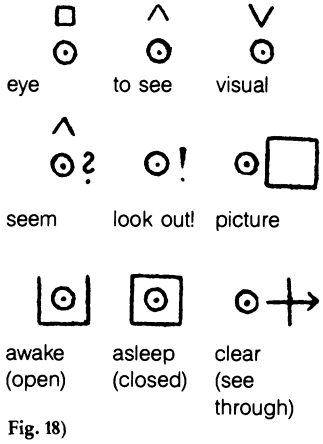

Fig. 18)

35) Charles Bliss, *Semantography/Blissymbolics* (Coogee, Australia: Semantography Publications, 1949, 1965).
36) Bliss, 265.

Conclusion

Otto Neurath understood that Isotype was not an autonomous, articulated language, yet he believed that visual communication could become a medium for unifying international social life. Pic-

torial signs offered the possibility of grounding language in a universal base of experience, appealing to the supposedly objective faculty of vision rather than to culturally bound interpretation. Neurath's philosophical project as a logical positivist was to create a scientific language whose system would mirror the structure of nature. At the popular level, he aimed to design a universal pictography for charting social facts, grounded in the apparent objectivity of perception. Neurath intended his visual language, like the proposed scientific language of the logical positivists, to become a set of signs free of the redundancy and potential ambiguities of an historically evolved verbal language.

Since the initiation of Isotype, a number of designers and writers have begun to question its purported objectivity and to formulate models of communication which stress the cultural relativity of images, and the openness of the categories "visual" and "verbal." Roland Barthes, writing in the 1950s and 1960s, analyzed images and objects as linguistic signs having historically determined, ideological functions.[37] In 1965 Gui Bonsieppe proposed a "visual/verbal rhetoric" for graphic design, one which would describe images in terms traditionally applied to verbal discourse.[38] Hanno Ehses, currently working at the Nova Scotia College of Art and Design, teaches designers to use patterns from classical rhetoric to generate ideas.[39] Francis Butler has written on the need for graphic designers to create images that are more culturally specific,[40] and the artist Victor Burgin has combined photography and text in projects which study sexual, political, and art historical issues.[41] Gregory Ulmer, a literary theorist, has proposed a visual/verbal practice based on the philosophy of Jacques Derrida, whose work attempts to dissolve the traditional distinctions between perception and interpretation, between objectivity and subjectivity. Ulmer's projected new discipline combines teaching, writing, and art: it could be a non-positivist revision of Neurath's role as educator, scientist, and designer.[42]

Many modern art schools have built a visual ghetto for the graphic designer. Though Otto Neurath helped to layer that theoretical wall, his work could also serve as a model for the graphic designer of the twenty-first century, the philosophical generalist, or the language worker who uses design as a tool for developing and promoting his or her own ideas.

For Otto Neurath, problem-solving involved designing the problem itself, that is, it involved defining the theoretical framework that allows particular questions to be asked. By extending a philosophical theory into a public context, Neurath initiated an original genre of communication, whose progeny have since been integrated into the public spaces of the industrial world. Now, in a changed technological and philosophical environment, designers and design educators must frame new questions about visual and verbal writing.

37) Roland Barthes, *Mythologies*; and Roland Barthes, "The Rhetoric of the Image," in Roland Barthes, *Image/Music/Text*, trans. Stephen Heath (New York: Hill and Wang, 1977).

38) Gui Bonsieppe, "Visual/Verbal Rhetoric," *Ulm* 14-16, 1965: 23-40.

39) Hanno Ehses, "Representing Macbeth," *Design Issues* I/1 (Spring, 1984): 53-63.

40) Francis Butler, "Eating the Image: The Graphic Designer and the Starving Audience," *Design Issues* I/1 (Spring, 1984): 27-40.

41) Victor Burgin, *Victor Burgin* (Eindhoven, Holland: Stedelijk van Abbemuseum, 1977), and Victor Burgin, *Between* (Oxford: Basil Blackwell, 1986).

42) Gregory Ulmer, *Applied Grammatology: Post(e)-Pedagogy from Jacques Derrida to Joseph Beuys* (Baltimore: Johns Hopkins University Press, 1985).

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