Living Life In Pictures: Isotype As Modernist Cultural Practice

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Abstract *The Vienna Method of Picture Statistics, also known as Isotype, has become a means for historians and theorists of modern culture to directly link visual modernism with modern social science and philosophy, specifically with logical positivism and Taylorism/Fordism. Isotype has been described in terms of Taylorist standardization, rationalism, 'transparent construction' and functionalism. By delineating the understanding of these terms held by Isotype's inventor Otto Neurath and his friends and colleagues, and contextualising Isotype in relation to recent reassessments of Neurath's other work, I suggest that Isotype participated in a modernism that was understood by its proponents in ways that were more plural, and pluralist, than we now give them credit.*

Keywords Isotype; Otto Neurath; modernism; Josef Frank; Taylorism; Vienna; Gerd Arntz; statistics; functionalism

The 2005 exhibition *Making Things Public* at the ZKM Centre for Art and Media in Karlsruhe included several Isotype charts, graphic statistical posters dating from the 1920s and 1930s. In the context of this exhibition, curated by Bruno Latour and Peter Weibel, the charts presented a challenge to contemporary artists and designers to come up with equally elegant and compelling visual methods adequate to current political and social arrangements. For the curators, as for several commentators on Isotype, the charts both exemplified the modern emphasis on positivist science, 'facts' and statistical evidence, and typified a modernist dream of communication without mediation, interference or noise, of a pure language.[1] Isotype is significant because it links this dream directly to positivism and connects modernism in design to Latour's characterisation of modernity in politics and science.[2] Since the 1980s, several texts on modernism and modernity have turned to Isotype to make similar connections. This is possible because of the 'clean' modernist graphic appearance of the charts, combined with their statistical content and the fact that Isotype's inventor, Otto Neurath, was a founding member of the Vienna Circle and a renowned (or notorious) logical positivist. Isotype has slowly begun to be pivotal in an understanding of the modern as a coherent category that can encompass the sciences and the arts, and in which ideas of rationalism and functionalism and in particular, the rationalisation of working-class life and labour by Taylorism, form a dominant strand. This essay challenges this definition of the modern

1. Bruno Latour, 'From Realpolitik to Dingpolitik - or How to Make Things Public', in B. Latour and P. Weibel (eds), *Making Things Public, Atmospheres of Democracy*, Cambridge, Mass., MIT Press, 2005, p5.

2. Bruno Latour, *We Have Never Been Modern*, Catherine Porter (trans), Cambridge, Mass., Harvard University Press, 1993, pp10-13.

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by suggesting that Isotype participated in a modernism that was more pluralist than we now give it credit. This is not to say that the reading of Isotype as a modernist representation of statistical facts is wrong, on the contrary. This argument suggests that we need a less narrow interpretative paradigm to understand the intersection of logical positivism, functionalist design and Taylorist rationalisation in Isotype. It aims to show some of the historical tensions at work in the views and practices of Neurath and his close friends and colleagues.

Neurath is largely forgotten now, but he was, in a sense, a 'hub' linking the artistic, scientific, philosophical and political avant-gardes in Europe and America. When he died in England in 1945 at the age of 63, he had been a sociologist and political economist, founder of the Unity of Science movement, and housing activist. Through his work in museums, social planning, and the housing and settlement movement of 1920s 'Red Vienna', and later through his work with CIAM (*Les Congrès Internationaux d'Architecture Moderne*), Neurath developed close connections with modernist architects and designers, including Josef Frank, El Lissitsky, Adolf Loos, Margarete Schütte-Lihotzky (the designer of the Frankfurt Kitchen), and the Bauhaus. Through the Vienna Circle, and unified science, he came into contact with the most important scientists, philosophers and mathematicians of his day, including the Frankfurt school, Albert Einstein and many others, while in Britain he was involved in the early planning of post-war reconstruction.

In the mid- 1920s, Neurath and his collaborators developed the Vienna Method of Picture Statistics (renamed Isotype in 1935), at the museums he founded in Vienna, the *Siedlungsmuseum* (Museum of Estate Housing) and then the *Gesellschafts-und Wirtschaftsmuseum* (Museum of Society and Economy). The method was devised to make statistical information legible to a non-specialist public. Neurath subsequently established a number of organizations in various countries devoted to producing Isotype charts for exhibitions, films and publications. These branches were a means to disseminate the method in accordance with his internationalist vision, but also a means to provide him and his staff with safe havens in recognition of the looming dangers of Austro-fascism and National Socialism.[3] The staff at the *Gesellschafts-und Wirtschaftsmuseum* (which opened in 1925) included researchers, who gathered statistics and read texts on an extraordinary range of subjects; artists working with, or under the direction of, Gerd Arntz; and the 'transformer' Marie Reidemeister, who mediated between researchers and artists by translating the research data into a visual layout.[4] When the Austrian Fascists took Vienna in 1934, Neurath, Reidemeister and Arntz fled to The Hague, where they established the International Foundation for Visual Education. As the German army entered Holland in May 1940, Reidemeister and Neurath escaped to Britain. After a brief spell in internment, they married, and founded the Isotype institute in Oxford in 1942. As before, they employed a mix of artists and researchers, including many drawn from the émigré community. The

3. Robin Kinross, 'Émigré Graphic Designers in Britain: Around the Second World War and Afterwards', *Journal of Design History*, 3,1 (1990): 42.

4. For a detailed account see Marie Neurath and Robin Kinross, *The Transformer: Principles of Making Isotype Charts*, London, Hyphen Press, 2009.

Neuraths generated content for charts, for exhibitions but also for books, where they accompanied images by Cecil Beaton, John Hinde, and John Heartfield. In Britain they adapted Isotype for animation in Ministry of Information films (such as *A Few Ounces A Day*) and Paul Rotha's epic *Land of Promise* (1945).

Marie Neurath continued the Isotype Institute for more than 30 years after Otto's death. In these years, their work in Vienna was largely forgotten. In the late 1970s and early 1980s, she worked with researchers and academics to publish his writings and tell the story of Isotype. She donated many of her and Otto's documents and publications to Reading University, which held an exhibition 'Graphic Communication through Isotype' in 1975. The catalogue of this exhibition was the first significant English language publication on Isotype since Neurath's death.[5] A 1976 exhibition at the *Gemeentemuseum* in the Hague showed Arntz's political and information graphics, while in Neurath's native Vienna, an exhibition held at the *Arbeiterkammer Wien* in 1982 was accompanied by a catalogue by Friedrich Stadtler on Neurath and Arntz. In 1987 the exhibition 'Global Signage: Semiotics and the Language of International Pictures,' opened at the Herb Lubalin Study Center at The Cooper Union, New York, curated by Ellen Lupton. The previous year, the artist Victor Burgin referred to it in the book accompanying his exhibition 'Office at Night' at the ICA in London. He brought it to the attention of the cultural historian Peter Wollen, who discussed Isotype in his essay 'Cinema, Americanism, the Robot' (1988) as an example of the ways modernist culture mirrored Henry Ford's car manufacturing system, and celebrated the uniformity and mechanisation which Europeans associated with the USA.[6] In 1990, Peter Galison published an essay entitled 'Aufbau/Bauhaus: Logical Positivism and Architectural Modernism', in which he linked Neurath's philosophical work and his Isotype practice with the Dessau Bauhaus's project of rational, functional design.[7] Isotype has now also been recognised as a key development in the history of pictograms, and in the development of computing (database structures and icon-based interfaces), but as these examples show it has also gradually regained a place beyond the specialised world of graphic design and typography, in the larger narratives of modernist culture. In this context there appears to be general agreement with Lupton's assessment of Isotype as the visual equivalent of logical positivism and with this succinct description from Burgin: 'Heir to the dream of "pure vision", it expresses the desire to know in a simple act of seeing'.[8]

The writing of Isotype into narratives of modernism, as an example that offered a direct link between positivist social science, and visual arts and design, coincided with a reassessment of Neurath's philosophical, social and economic arguments.[9] While Isotype had been merely neglected in the post-war period, Neurath's work in these fields has been oversimplified, as a result of critiques during his lifetime and shortly afterwards (most famously by Max Horkheimer and Theodor Adorno, and, from a completely different political

5. *Graphic Communication Through Isotype*, Reading, Reading University, 1975.

6. Peter Wollen, 'Modern Times: Cinema, Americanism, the Robot' in *Raiding the Icebox: Reflections on Twentieth-Century Culture*, London, Verso, 1993. Originally published in 1988-9.

7. Peter Galison, 'Aufbau/Bauhaus: Logical Positivism and Architectural Modernism,' *Critical Inquiry*, 16,1990: 709-752. doi:10.1086/448557

8. Victor Burgin, *Between*, Oxford, Blackwell,1986.

9. Key English language texts in this re-evaluation of Isotype include: Elisabeth Nemeth and Friedrich Stadler (eds), *Encyclopedia and Utopia: The Life and Work of Otto Neurath* (1882-1945), Dordrecht, Kluwer, 1996; Thomas E. Uebel (ed), *Rediscovering the Forgotten Vienna Circle*, Dordrecht, Kluwer, 1991; Nancy Cartwright, Jordi Cat, Lola Fleck and Thomas E. Uebel et al., *Otto Neurath: Philosophy between Science and Politics*, Cambridge, Cambridge University Press, 1996; John O' Neill, 'Unified science as political philosophy: positivism, pluralism and liberalism', *Studies in the History and Philosophy of Science*, 34 (2003): 575-596.

perspective, by Friedrich Hayek in *Road to Serfdom* (1945), an influential critique of social planning).[10] Recent writers have challenged in particular several related assumptions: one, that Neurath was an unthinking advocate of rationalist planning and technocratic politics; two, that his views were identical to those of his Vienna Circle associate, Rudolf Carnap; three, that his famous rejection of metaphysics amounts to a rejection of uncertainty and total faith in the power of science and analytical reason; four, that Neurath advocated an absolutely functional and transparent language. This more nuanced understanding of Neurath's other practices might also complicate Isotype's relation to Taylorist rationalisation and functionalism.

10. Max Horkheimer, 'Der neueste Angriff auf die Metaphysik', *Zeitschrift für Sozialforschung* 6, pp4-53, (trans). 'The Latest Attack on Metaphysics', in *Critical Theory. Selected Essays*, New York, Seabury Press, 1972, pp132-87. Theodor Adorno and Max Horkheimer, Dialektik der Aufklärung, (trans). *Dialectic of Enlightenment*, (London, Verso, 1986). Originally published in 1944. Friedrich Hayek, *The Road to Serfdom*, London, Routledge, 2001. Originally published in 1944. See also John O'Neill and Thomas Uebel, 'Horkheimer and Neurath: Restarting a Disrupted Debate', *European Journal of Philosophy* 12:1: 75-105.

TAYLORISM, FORDISM, AMERICANISM

One way of reading Isotype is as part of the early twentieth-century modernist tendency towards rationalism, technophilia, and Americanism (i.e. the idealisation of the industrialised USA). Peter Wollen describes one of a number of charts produced by the *Gesellschafts-und Wirtschaftsmuseum* under Neurath's direction:

> The standard Isotype signs were combined into complex charts and diagrams in order to convey information visually with immediacy and clarity. Thus a chart showing automobile production in 1929 contrasts five identical silhouette workmen and fifty-five identical silhouette automobiles for the USA with eight workmen and only seven cars for Europe. The rows of standardized human figures are immediately reminiscent of the factory discipline under which the real workers worked on the assembly line as well as Carnap's contemporary arithmetization of syntax. (The whole chart also graphically illustrates the impact of Fordism and the enormous European productivity lag that gave rise to the voluntaristic upsurge of Americanism).[11]

11. Wollen, op. cit., p40.

Several versions of this chart were made; the one Wollen describes is probably the one published in *International Picture Language* (1936). The cars are depicted in two grids below the lines of workers, the continents (America and Europe) signified by a strip of factory buildings and landmarks. An earlier, colour version of the same chart (fig. 1) makes it explicit that the figures refer to 'North and South America', not the USA.

Additional text explains that each human figure represents 100,000 workers employed in the car industry and that every car stands for 100,000 cars produced, so we can arrive at exact numbers through simple addition and multiplication. We can also conclude that every worker produces just under one car a month in America, and less than one a year in Europe. Even at a glance, we can see that productivity is much greater in America. The assembly line is represented in simplified graphic form behind the workers

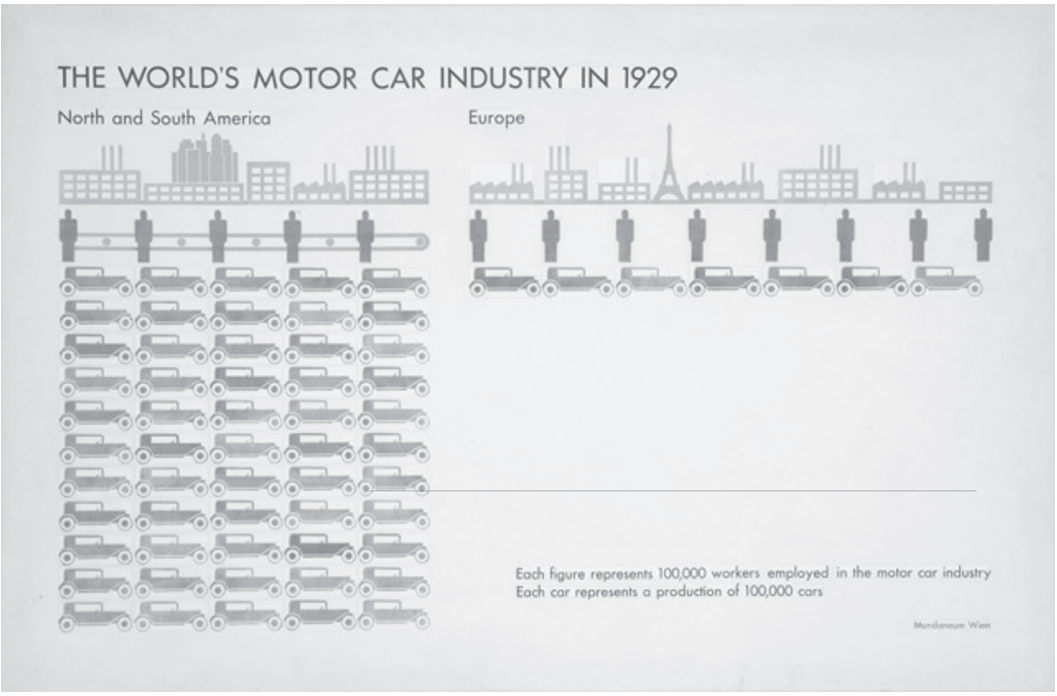


FIG 1: Vienna Method Chart produced by the Vienna Mundaneum (the organization Neurath founded to oversee international exhibits for the Gesellschafts-und Wirtschaftsmuseum), 1933. *Otto and Marie Neurath Isotype Collection, Department of Typography & Graphic Communication, University of Reading.*

in America - a hint at a possible reason for the difference in productivity, but not one necessarily immediately noticed.[12] The rows of standardised figures may be reminiscent of the factory discipline of Fordism, yet the American figures are no more standardised than the European. The standardisation of letters and numbers through the development of moveable type predates the standardisation of interchangeable parts that was the hallmark of Ford's automobile manufacturing system. If we think of these worker-figures as replacing numeric figures, then this standardisation is not necessarily Fordist. Nor is it entirely evident that the chart supports 'Americanism'. The assembly line is proposed as an explanation for the difference in productivity, but whether this is desirable, or what its consequences are, are questions for the working class visitors to the *Gesellschafts-und Wirtschaftsmuseum* to debate. What happened to the other car workers in America, what were the unemployment statistics there? What different kinds of skills did the workers need? How wealthy is a society that consumes so many cars? Had assembly line manufacture spread to South America as well as the US and Canada? What was the meaning of all this for people living in Austria? In other words, enthusiasm for the American production system was not the only possible outcome.

12. Elisabeth Nemeth, 'Socially Enlightened science. Neurath on Social science and Visual Education', in M. Ouelbani (ed), *Themes de Philosophie Analytique*, Tunisia, University of Tunisia, 2006, p99.

In some ways, the standardised appearance of the Isotype chart is rather misleading. As with the products of Soviet constructivism and of the Bauhaus, it gives the impression of mass manufacture when actually these charts were in many respects handcrafted objects. Charts using the Vienna method were assembled from linocuts printed on a treadle press. Each little worker-icon appears almost identical because each is printed from the same piece of lino (though a close look shows variations in the printing). Later the pictograms were made using letterpress, but even then, the production entailed hand-pasting the printed images onto the charts. Such cutting and pasting techniques had democratic associations, and were used in the teaching of mass literacy by Maria Montessori who used cut-out sandpaper letters in kindergarten (the picture statistics were tested in Montessori's kindergarten in Vienna).[13] In these charts, standardisation is a process of condensation, transforming large amounts of data into small pictograms, and of simplification, reducing inessential detail. It is a process which enhances legibility, since the same pictograms are reproduced across different charts, and a process enabling accessibility and ease of production. The visual approach of the Vienna Method was developed over several years, through a number of iterations, and the chart that Wollen refers to is a good example of its most well-realised form. The team at the *Gesellschafts-und Wirtschaftsmuseum* had arrived at a clear, legible layout in which people and occupations were represented without unnecessary or misleading details of costume and posture.

13. See Friedrich Stadler, 'Otto Neurath: Encyclopedist, Adult Educationalist and School Reformer', in T.E. Uebel, op. cit., pp262- 263.

The structure and layout of the charts derived from theories of statistical representation, and used criteria of accuracy, clarity and legibility: Neurath set rules for the use of colour and scale, for example, and other restrictions would be necessitated by reproduction technologies. The succinct visual style of the charts and the individual pictograms also derived from Gerd Arnz's experimentation in his political prints of the 1920s (monochrome linocuts). Arntz opposed the reduction of social classes to visual types in the work of artists such as George Grosz, reportedly stating: 'Grosz ... draws the capitalist as an ugly and fat criminal ... I sought to show the position of the capitalist in the system of production - for that they need not be as ugly as Grosz made them'.[14] The anonymity of the figures in Arntz's own political prints, and in his work in picture statistics, is connected to the imperative to depict social and economic relations, to 'reveal social contrasts and show social opportunities, not just moralising criticism'.[15] So while it represents Fordism, the relationship of the chart to Fordist standardisation is not straightforward.

14. Gerd Arntz, cited in Martyn Everett, 'Art as a Weapon: Frans Seiwert and the Cologne Progressives', *The Raven*, 12 (1990).

Contributing to this complexity is Arntz's own critical position toward Fordism, exemplified in his political prints. Arntz was a member of the Cologne Progressives, a group of politically active (socialist and communist) printmakers, before joining Neurath in Vienna. In one political lino-print from 1924 (fig. 2) Arntz depicts six women, their arms across one another's shoulders, each clothed in a different swimsuit and socks of varying length and pattern, a variety

15. Gerd Arntz, cited in Everett, op. cit.

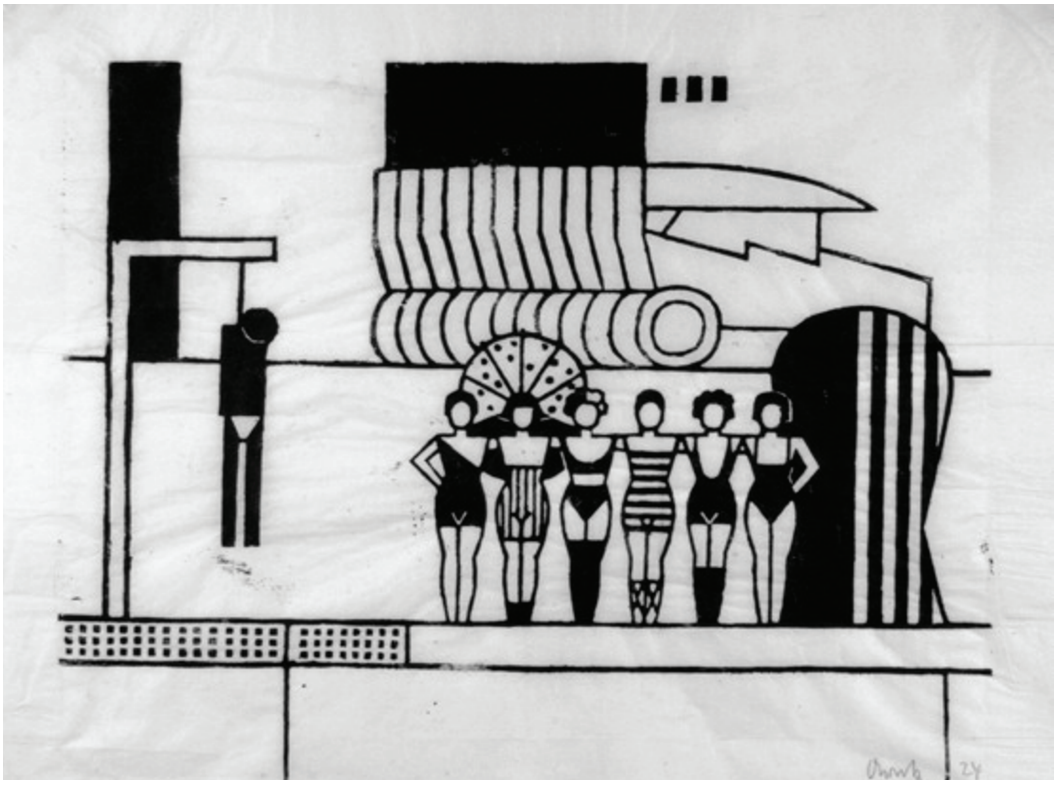
which doesn't quite manage to conceal the fact that the figures are identical (like all Arntz's figures, they are blank-faced and anonymous). Behind them a few simple lines constitute a Model T Ford. The lines indicating the back of the car, repeated eleven times, make one car into a series, a dozen identical automobiles. On the left of the pageant of women is a simple hangman drawing; a black silhouette with slumped head, white underpants and two thin rectangles for legs, contrasting with the curved, closed legs of the women, their dazzling patterns and their upright, frontal appearance.

The print is reminiscent of Siegfried Kracauer's essay, 'The Mass Ornament' published three years later, in 1927. The essay, famously, is an analysis of the Tiller Girls Revue (a British dance troupe, but associated with Americanism and Fordism in the minds of German observers). Kracauer argues that both capitalism and the revue or parade (the mass ornament) appear at first as highly rational constructions, but have an irrational, mythological or 'primitive' core.[16] In Arntz's print this primitive core is represented by the lynching, the element of the print which recalls Walter Benjamin's thesis 'there is no document of culture [/civilization] which is not at the same time a document of barbarism'.[17] In other words, the lynchings occurring in the

16. Siegfried Kracauer, 'The Mass Ornament', (trans). See Barbara Correll, Jack Zipes, in *New German Critique*, 5, (1975): 70 and 75-6.

17. Walter Benjamin, 'On the Concept of History', *Selected Writings: Volume 4 1938-1940*, E. Jephcott et al. (trans), H. Eiland and M.W. Jennings (eds), Cambridge, Mass, Harvard University Press, 2003, p392. Written in 1940. Earlier translations give 'civilization' rather than 'culture' for the German 'Kultur'.

FIG 2: Gerd Arntz, 'Americanism' *(1924). In the Otto and Marie Neurath Isotype Collection, Department of Typography & Graphic Communication, University of Reading. © DACS 2010.*



American South are part of the same culture of display and mass action as the beauty pageant and Fordist production. By the 1930s, clear parallels between the racism of the Southern states, and that of the Nazis would be being drawn on both sides of the Atlantic.[18] Through the image of the lynching, Arntz implies a connection between the ordered rationalised modernity associated with Americanism and Fordism and an irrational barbarism.

18. Johnpeter Horst Grill and Robert L. Jenkins, 'The Nazis and the American South in the 1930s: A Mirror Image?' *The Journal of Southern History*, 58, 4, 1992: 667-694.

For Kracauer the mass ornament's irrational core is to do with the dehumanisation of the individuals who make it up, it is 'mythological cult wrapped in abstractness'. It echoes the efficient actions of the modern Taylorised workforce, subordinating the individual dancer to the larger visual effect, just as the worker becomes part of the collective machine. Kracauer's reading of social relations under capitalism is in keeping with German sociological views of the time, exemplified by Ferdinand Tönnies who saw modern civil society as constituted by separated individuals, 'starkly equal, elementary units of labour, like atoms' working en masse for their own gain and for society.[19] Kracauer describes dancers in these mass public displays as 'building blocks' in the construction of an 'edifice'; a 'pattern of unimaginable dimensions'. These patterns are not rooted in community or ritual (as say, traditional forms of folk dancing), symbolically 'empty' and regressive. Kracauer argues that 'the structure of the mass ornament reflects that of the general contemporary situation' in which capitalism destroys individual and national differences. Statistical measurement and mechanisation are complicit in this process: 'only as a tiny particle of the mass can the individual human being effortlessly clamber up charts and service machines'.[20]

19. Ferdinand Tönnies, *Community and Civil Society*, J. Harris and M. Hollis (trans), Cambridge, Cambridge University Press, 2001, pp56-57. Originally published in 1887.

20. Kracauer, op. cit., pp67-76.

The individual transformed into an anonymous part of a 'mass' and climbing up charts does sound remarkably like a figure on one of the Vienna method charts produced at the *Gesellschafts-und Wirtschaftsmuseum*. Indeed, Wollen makes the point that there is a resemblance between the Tiller Girls and the Isotype chart, commenting 'The Tiller Girls were like Neurath's Isotypes, marshalled in identical lines'.[21] Arntz's swimsuited figures do not represent the Taylorist Tiller Girls, but rather, the 'bathing beauties' pageants referred to by Antonio Gramsci in his analysis of Americanism and Fordism. In *Quaderno V* of his prison notebooks (written between 1929 and 1935), Gramsci sees Fordism as geared toward the production of 'a new type of man' via a process that required the regulation of sex and family life. Taylorism 'and rationalisation in general', Gramsci writes, 'demand a rigorous discipline of the sexual instincts' and of alcohol, meaning that the working class is persuaded and coerced (via Prohibition, for example) into a puritanical morality at odds with the libertinism practised by other classes. The 'bathing beauties' phenomenon is in Gramsci's reading associated with the 'moral gap' between the puritanical, monogamous working classes ('womanising demands too much leisure') and the 'passive' non-productive elements of society who 'stimulate the mental attitudes of prostitution'. Arntz's prints from the 1920s could accompany Gramsci's text beautifully: they too associate prostitution

21. Wollen, op. cit., pp55-6.

and 'libertarian' sexual practices with the upper classes and the military, while depicting the working classes as monogamous family units. Gramsci sees this new puritanical drive as 'the biggest collective effort to date to create, with unprecedented speed, and with a consciousness of purpose unmatched in history, a new type of worker and of man'. Thus Fordism 'smashes' the worker's humanity in order to maintain 'psycho-physical equilibrium' in workers because it conceives of the collective worker as a machine.[22] By the mid 1920s the idea of the mechanisation of the worker's body is well-known, and Arntz makes this vivid in one print (fig. 3), giving assembly line workers wrenches, screwdrivers and hammers for hands.

As cultural phenomena, Taylorism, Fordism and Americanism tend to be treated together in the European left's understanding of capitalism in the 1920s and '30s. However, Ford's assembly line and F.W. Taylor's ideas about scientific management were not viewed as synonymous by Neurath and his associates in social and economic planning. The Taylorist Mary Flédderus financed Neurath's International Foundation for Visual Education in The Hague. She and her partner Mary Van Kleeck conducted a study of labour conditions at the Ford Plant, and condemned the Ford system as disastrous and completely incompatible with scientific management.[23] Neurath himself was an early but unorthodox advocate of scientific planning. He had long been actively involved in planning, as Rations and Provisions Officer in the Army Corps from 1910, director of the Bavarian Central Planning Office in Munich, as part of the short-lived Bavarian free state circa 1918-19 (when it was overthrown he survived a death sentence, principally because he insisted his role was technical rather than political), and then in Red Vienna. In the UK he became involved with organisations such as the Association for Planning and Regional Reconstruction and the Political and Economic Planning Bureau.

In 1917, Neurath had proposed

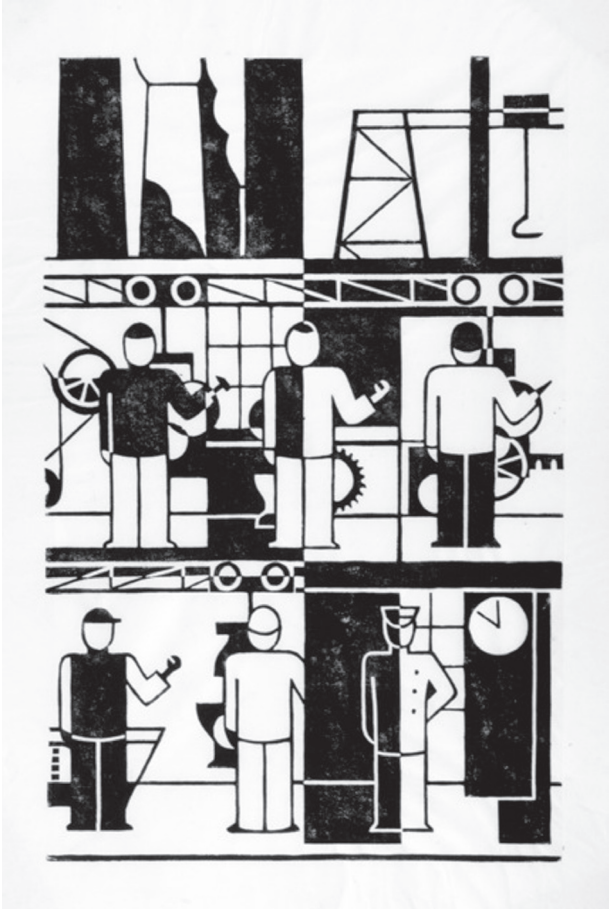


FIG 3: Gerd Arntz, 'Factory' *(1927). In the Otto and Marie Neurath Isotype Collection, Department of Typography & Graphic Communication, University of Reading. © DACS 2010.*

22. Antonio Gramsci, 'Americanism and Fordism', *Selections from the Prison Notebooks of Antonio Gramsci*, Q. Hoare and G. Mowell Smith (eds and trans), London, Lawrence and Wishart, 1971, pp294-303. Written 1929-1935.

23. See Guy Alchon, 'Mary Van Kleeck and Scientific Management,' in D. Nelson (ed), *A Mental Revolution: Scientific Management since Taylor*, Columbus, Ohio, Ohio University Press, 1992, and Chris

Nyland and Tom Heenan, 'Mary van Kleeck, Taylorism and the Control of Management Knowledge,' *Management Decision* 43, 10 (2005): 1358-1374.

24. Otto Neurath, 'The Converse Taylor System: Reflections on the Selection of the Fittest', in Neurath and Cohen, *Empiricism and Sociology*, 133. Originally published as '*Das umgekehrte Taylorsystem*,' in *Kunstwart und Kulturwart*, Dresden (1917).

25. Ibid.

a radical humanist revision of Taylorism, his own 'Converse Taylor System', which advocated the development of jobs and organisational structures out of the diversity of people 'as we find them'.[24] Taylorism, he suggests, does not have to 'increase the general mechanization of living' but could become 'a principal force of a new humanism'. Like Kracauer he sees social uniformity as negative, but as only a temporary first consequence of social and economic planning, which people tolerate insofar as it is accompanied by improvements in living conditions and stability, and a reduction in unemployment and poverty. Because of this 'it will doubtless take some time before an incisive criticism is raised against the uniformity. But the wish for co-existence of different forms of life and organization would then show itself more forcefully, and it might not be impossible that a multiplicity of forms of life adapted to the multiplicity of men themselves should become the mark of the future next-but-one'.[25]

Neurath would later avoid predictive writing, but some of the passions and ideas he pursued throughout his life are here: the Epicurean idea of a tolerant society based on maximising human happiness and rooted in the actual needs of people in all their diversity; the rejection of the free market economy in favour of the planned society; the tendency to treat social and economic planning as an activity independent of a specific political system; and the emphasis on the use of social planning 'to facilitate the simultaneous existence of as many forms of life as possible'. Contrast this to Gramsci, for whom both the political promise and the barbarism of Fordist-Taylorist industrialism lay in its attempt to create a 'new type of man' adapted to the various demands of capitalist industry.

In the German sociology of modernity of Tönnies, Simmel and Weber, modern mass society characterised by science, rationalisation and atomisation, was contrasted with an older form of sociality or community of 'natural bonds', magic, ritual, and paternalistic and priestly authority. This diagnosis shapes Kracauer's image of the mass as a conglomeration of isolated, atomistic individuals. Neurath shared this intellectual background with Kracauer, but in his view, new communal bonds of association, real organic collectives, were possible within the context of a mass society. Moreover, statistics and the methods of social science could be mobilised to produce this. Neurath first deployed picture statistics in exhibitions developed in the context of the social and economic crisis in post-war Vienna, as the Social Democratic city council began an extensive programme of changes to the social and economic infrastructure. Economic collapse during the Great War had led more than 100,000 people to build makeshift homes and plant vegetable gardens on public land on the outskirts of the city. This self-help movement became organised into co-operatives, and was at first far more effective than the socialist municipality, which was struggling with the Austrian economic collapse and constitutional crisis. Neurath worked as a sympathetic mediator between the city government and the co-operatives. He promoted the self-help

housing movement, helping to create organisations to unify and promote the interests of the settlers and allotment-holders, provided courses for settlers, architects and councillors, organised public demonstrations and exhibitions in the city centre, and negotiated with architects and city planners.[26]

The Vienna Method charts were produced first as exhibition materials at the museums he founded with the support of the municipality. They addressed the working-class citizens who would be the first beneficiaries of the new social provisions, such as housing developments and health initiatives, enabling them to see their place in larger developments, in Vienna and worldwide. As Elisabeth Nemeth emphasizes, 'the museum was not a place where scientific truths about society and economy were conveyed to the layman … [but] a place where people - most of them without higher education - could learn to look at social issues in a new way and practice doing this'.[27] Lending themselves to comparative judgment and contemplative thinking, exhibition charts were intended to engage the viewer on first sight, requiring closer examination to be fully understood, but avoiding detail which detracted from the overview. By opening up this overview and encouraging reasoned comparison and debate, the *Gesellschafts-und Wirtschaftsmuseum* exhibitions engaged the Viennese working class in the reconstruction of Red Vienna, rather than simply communicating the reconstruction after the fact. They were components in a programme of social and economic planning that utilised Taylorist techniques. The view of the working class as an anonymous mass of atomised individuals was very alien to this application of Taylorism (converse or otherwise) in the service of socialist, anti-free market economics.

It was clear in 1920s Vienna that Taylorist planning could be mobilised in different ways, with distinct social and political consequences. This can be illustrated with an example. One of the architects associated with Neurath and the Viennese settlement movement was Margarete Schütte-Lihotzky, who designed her prototypical 'Frankfurt Kitchen' using Taylorist principles. Schütte-Lihotzky introduced an innovation in efficiency by abandoning the traditional *Wohnküche* (live-in kitchen) characteristic of working class homes in Germany and Austria. She used time-motion studies to design new 'working kitchens' that separated the activity of cooking from the other activities of the home.[28] The municipality of Vienna adopted this model in the late 1920s for their community housing blocks or Gemeindebauen. Neurath's closest architectural associate, the architect Josef Frank, responded acidly to Vienna's introduction of these kitchens, arguing that they destroyed the proletarian home despite the fact that 'the greatest proportion of civilised humanity live in the kitchen'. Interestingly, Frank describes this as a return to the 'speculatively built dwelling'.[29] Speculation, usually associated with metaphysics by advocates of empiricism such as Neurath, is here associated with Taylorist ergonomic design. Time-motion studies or other purportedly rational attempts to systematise living and make homes efficient are speculative in Frank's view because they propose new domestic arrangements that are not rooted in the

26. On Neurath's activities in the settlement movement in Red Vienna see Cartwright et al., op. cit.; Eve Blau, *The Architecture of Red Vienna 1919-1934,* Cambridge Mass., MIT Press, 1999, and Vossoughian, op. cit.

27. Nemeth, op. cit., p95.

28. Blau, op. cit., p199.

29. Josef Frank, 'Der Volkswohnungspalast: Eine Rede, anlässlich der Grundsteinlegung die night gehalten wurde,' *Der Aufbau* 1, (1926): 109. [The People's Housing Palace: A lecture Presented on the Occasion of a Groundbreaking That Never Took Place]. Translation from Blau, op. cit., p200.

actual everyday lives of the working class tenants. Frank implicitly aligns the new kitchens, and the 'speculative' application of Taylorist techniques with what Neurath called 'pseudo-rationalism'. Briefly, this is the belief that it is possible to root all decisions (including design decisions) in conscious, rational insight. This belief, Neurath argues, ignores the necessary arbitrariness in decision-making and in everyday arrangements. In a 1913 essay, Neurath emphasised that social action could not be based on rational or objective certainties. To believe you can achieve everything through conscious, rational insight is 'pseudorationalism', which derives from the same root as superstition and mysticism.[30] Neurath's philosophical rejection of certainty accompanies a rejection of over-rationalised planning which does not take sufficient account of human needs and human happiness.

30. Otto Neurath, 'Die Verirrten des Cartesius und das Auxiliarmotiv', *Jahrbuch der philosophischen Gesellschaft ander Universitat Wien* 1913, pp45-59, (trans). 'The Lost Wanderers of Descartes and the Auxiliary Motive' in Otto Neurath, *Philosophical Papers* 1913-1946, R. S. Cohen and M. Neurath (eds), Reidel, Dordrecht, 1983.

ISOTYPE, FUNCTIONALISM AND UNIFORMITY

Architects who used ergonomics and time-motion studies set out to reinvent everyday tasks according to rational principles, and ultimately, shape a new way of life [*Gestaltung des Lebens*] on this basis. The commitment to 'functionalism' and rationalism of the *neue Sachlichkeit* (new objectivity) in architecture and design is underlined by its use of Taylorist time-motion and ergonomic studies. Galison reads Isotype in this light, and views Neurath as a proponent of the technical and architectural production of the new way of life via his involvement with the Dessau Bauhaus under Hannes Meyer. Galison points out that, 'Throughout their writings Carnap, Neurath, and others singled out modern architecture as the cultural movement with which they most identified'.[31] Using Neurath's 1928 book *Forms of Life and Class Struggle*, Galison summarises,

> Since rationality and scientificity were to characterize the revolutionary proletariat orientation, the architecture of modernity demanded rationality and functionalism. Modern architecture, Neurath believed, could both reflect and shape 'the spirit of modern times'. Again and again, he argued that 'significant movements of the age' striving to shake loose of the past would ignore the example of the Bauhaus only at their peril.[32]

31. Galison , op. cit., p710-716. See also Neurath's essay 'Das Neue Bauhaus in Dessau', *Der Aufbau* 1, no. 11/12 (1926): 210-11.

32. Peter Galison, 'Aufbau/Bauhaus,' 716. The text he refers to is Otto Neurath, *Lebensgestaltung und Klassenkampf. Gesammelte philosophische und methodologische* Schriften, H. and H. Rutte (eds), vol. 1,Vienna, 1981, pp235-36.

In his *Theory and Design in the First Machine Age*, Reyner Banham states that functionalism was by the mid thirties used 'as a blanket term for the progressive architecture of the twenties and its canon of approved forerunners that had been set up by writers like Siegfried Giedion'.[33] Banham's argument is that functionalism was not characteristic of 1920s architecture, even if its theorists and architects described it as such. However we can draw quite a sharp difference between the practices of the Dessau Bauhaus after 1928 (when it was directed by Hannes Meyer) and the architectural projects in which Neurath was most closely involved, the *Gemeindebauen* in Vienna.

33. Rayner Banham, *Theory and Design in the First Machine Age*, p320.

These used standardised interchangeable parts, but were as concerned with symbolism as they were with functionality, rationalisation and efficiency. Architectural historian Eve Blau describes the social housing projects of Red Vienna in the late 1920s as using a conventionalised typology, much as the Vienna Method (or Isotype) did. Different combinations of mass-produced architectural components communicated 'how each building was to be used and what its relation was to the larger program of Red Vienna, as well as to traditional building practices and the physical fabric of the historical city of Vienna'.[34]

In his essay written on the opening of the Dessau Bauhaus in 1926, Neurath had, as Galison summarises, 'gently chided the Bauhaus for relying too much on the style of modernism and not sufficiently on its practical implications'.[35] Nevertheless, Neurath was not opposed to aesthetics in the sense of visual or sensory pleasure. In his writing he repeatedly emphasised that any calculation of efficiency or use must be tempered by the recognition of the significance of everyday sensory pleasures. Marie Neurath recalled how he talked of the Bauhaus, and 'ridiculed one of their designs, a house for bachelors, from the point of view of the human beings who were to live that way'.[36] However irrational or arbitrary actual lived practices may appear, they should be the grounds for stylistic choices, rather than the desire to give an appearance of functionality or the scientific analysis of human movement. Neurath and his colleagues put this principle into practice in the production of picture statistics and charts: at the *Gesellschafts-und Wirtschaftsmuseum* in Vienna and later, the Isotype Institute in Oxford, their methods were repeatedly tested on audiences and in schools, and adjusted in the light of these findings.

Neurath's version of functionalism is one that begins with people 'as we find them', a proposition first set out in his 1917 essay 'The Converse Taylor System'. A clear example of what he took to be the needs and 'functions' fulfilled by a designed object (or graphic symbol, or building) is given in his correspondence of 1945. In that year, the Isotype Institute was involved in a slum-clearance project in Bilston, near Wolverhampton.[37] In November, Neurath wrote to A.V. Williams, the town clerk and driving force behind the Bilston redevelopment, on the importance of enabling 'the slum-dwellers to continue certain peculiarities of their life' (things they enjoyed and did not want to abandon); 'I am looking at all these items from a personal point of view, how a single person in your society may look at it, as a father, as a tired person, as a person who would like to read a book'.[38] This idea of designing for diverse human needs also informed the work of Adolf Loos, who worked alongside Frank and Neurath on the Viennese social housing in the 1920s and 1930s. Loos wrote, 'Following the principle that every type of tiredness requires a different chair, an English room is never furnished with one type of seat alone'.[39] Neurath and his friend Josef Frank both held that there could not be any true or complete functionalism since it was impossible to anticipate in advance the uses to which things would be put. The function of a chair may

34. Blau, op. cit., pp13 and 400.

35. Galison, op. cit., p716. Galison is referring to Neurath, 'Das Neue Bauhaus in Dessau'.

36. Marie Neurath, 'Memories of Otto Neurath' in Neurath and Cohen, op. cit., p60.

37. On Neurath's work in Bilston see Michelle Henning 'The Pig in the Bath: New Materialisms and Cultural Studies', *Radical Philosophy*, 145 (2007): 11-19 and Sybilla Nikolow, 'Planning, Democratization And Popularization with Isotype ca. 1945: A Study of Otto Neurath's Pictorial Statistics with the Example of Bilston, England', in Friedrich Stadler (ed) *Induction and Deduction in the Sciences*, Dordrecht, Kluwer 2004, pp299-329.

38. Otto Neurath letter to A.V. Williams, 5 November, 1945. Isotype 1/12-13, in the Otto and Marie Neurath Isotype Collection, Department of Typography and Graphic Design, University of Reading.

39. Adolf Loos, *Ornament and Crime: Selected Essays*, Michael Mitchell (trans), Adolf Opel (ed), Riverside, Calif., Ariadne Press, 1998, p65.

be 'alleviating tiredness' or it may be 'sitting down' but neither captures the full range of uses to which a chair is put, and no chair can be designed with the foreknowledge of all those uses. In a letter to Frank describing his escape from The Hague, Neurath described parachutists fighting with machine guns on the roofs and added an ironic aside to the architect - 'you see the result of modern flat roofs - a fine thing for fights'.[40] This example shows, not the fallibility of flat roofs, but the impossibility of knowing the results of design decisions in advance.

England seemed to offer some particularly vivid examples of the necessity and difficulty of redesigning the everyday. In a lecture given in Cambridge in 1941, Neurath contrasted the uses of fires in houses in Germany and England. A fire might be conceived as 'a tool for making warm' but it also might function (depending on its design) for 'centralising, grouping people'. So, 'changing the fireplace institution means changing many things: we cannot say what'.[41] Any attempt to make rational technical improvements to the fireplace must take into account the love of 'cosiness'. Neurath explained that his German-speaking friends viewed the English fireplace as a 'waste of calories', since most of the heat goes up the chimney, yet he argues, via a comparison with skiing, that what one person views in terms of efficiency (the burning of calories), another calls pleasure. Frank shared this emphasis on aesthetic, sensory pleasure. As the only Austrian architect chosen to contribute to the 1927 German Werkbund exhibition in Stuttgart, Frank built two houses which, though technologically innovative, were interpreted as a direct and provocative challenge to the *neue Sachlichkeit* in architecture. Theo van Doesburg lambasted the interiors for being 'femininely appointed' and 'middle class', while other critics talked of being 'caressed', of 'frippery' and of the house as a 'bordello'.[42] Frank's defence of his work rejected the notion of ornament as gender-specific and the denigration of the feminine that this implied. He responded that the bare, 'functionalist' style of interior did not cater to actual psychological needs: 'Every person has a certain measure of sentimentality which he must satisfy,' he argued; 'frippery' provided comfort.[43]

As Galison suggests, Frank 'tried to navigate between left and right, between a naively progressivist (and, in his view, affected) functionalism of the Germans and his own countrymen's penchant for ornamentation, regionalism, and nationalism'.[44] He was not alone.

Cosiness and comfort were priorities for Neurath in his own everyday life and, he assumed, for the working people of Vienna and England. Friends' reminiscences of Neurath's home in Vienna describe a space organised (even Taylorised) for the use of Neurath's then wife, the mathematician Olga Hahn, who was blind; but also a comfortable space, decorated with Chinese objects and fabrics. An acquaintance, Ernst Lakenbacher, described meeting Neurath in the army service corps, and how he rapidly transformed their remote and bare living quarters 'into a cosy study, making use of old crates and pictures

40. Otto Neurath letter to Josef Frank, September 22, 1942. Österreichische Nationalbibliothek, Otto and Marie Neurath Nachlass, Vienna, 1219/5.

41. Otto Neurath, 'Logical Empiricism', lecture given at Bedford College, Cambridge, November 9, 1941. The Otto Neurath-Nachlass microfilm collection, Institut Weiner Kreis, Vienna.

42. Cited in Christopher Long, *Josef Frank: Life and Work*, Chicago, University of Chicago Press, 2002, p108.

43. Frank cited in Long, op. cit., p109.

44. Galison, op. cit., p723.

from periodicals'.[45] Wolfgang Schumann, who met Neurath in 1906, recalled, 'he told me of his research into the character of lavatories in Vienna, especially regarding their cosiness. I was startled, but extremely impressed by the man'.[46] This interest in the cosiness of toilets reappears as a criticism of Le Corbusier's architecture in a 1945 letter to Frank. Neurath recounted, 'when we asked the lady where the bathroom is, we learned after some hesitation that it was just this dark hole, in which one could hardly move'.[47] Frank argued that working people were less attracted to bare furnishings than intellectuals: 'The demand for bareness is made particularly by those who think continuously, or at least need to be able to do so, and who can obtain comfort and rest by other means'.[48] A Persian carpet could provide an unlimited amount of detail, which given time to contemplate, has 'a calming effect'.[49]

It seems that Neurath concurred with his close friend when it came to the domestic interior, but followed a very different approach with Isotype. Just as Josef Frank's brightly-patterned, exuberant textile designs are very different in appearance from the designs of the *neue Sachlichkeit* (Frank later became a key figure in the Swedish Modern movement), they also stand out from the austere geometric aesthetic of Gerd Arntz and Isotype. Certainly Isotype charts appear visually stripped down, and rationalised, their uniform simple appearance is intended to facilitate reading and discussion. While, even in the 1920s, neither Neurath nor Frank had been unequivocal supporters of a bare, minimal aesthetic in design, the *Gesellschafts-und Wirtschaftsmuseum* housed a simple, modern display structure designed by Frank to draw attention away from the soaring Gothic ceilings of the *neues Rathaus*. Isotype charts were intended to be encountered for a limited time in the space of the museum, and relatively quick comprehension and debate is the aim. The Persian carpet belongs at home, where relaxation and quiet, absent-minded contemplation is needed. Nevertheless, the visual style of an Isotype chart is not purely to do with legibility. Like the *Gemeindebauen* and the designs of the Bauhaus, Isotype charts use visual style to position themselves within a larger social and political context.

By rejecting extraneous detail and unnecessary ornamental flourishes, the *Gesellschafts-und Wirtschaftsmuseum*, and later the Isotype Institute, symbolically committed itself to the equalising power of modernity. The early charts made by the museum had included the trappings of social class and ethnic difference, indicated by details of dress, but as Isotype developed it tended toward very simple schematic indicators of such differences. Neurath's 1939 book *Modern Man in the Making* includes an Isotype picture which shows how visual uniformity was linked with technological modernity (fig. 4). It depicts the transformation of battle-dress over time. Five soldiers in historical battledress from different parts of the world are arranged above five soldiers in identical nondescript uniforms. All are depicted in Isotype style, with blank faces and a simple colour palette, but the lower row of men are distinguished from one another only by a colour-coding of their faces. In the

45. Ernst Lakenbacher, 'Memories of Otto Neurath' in Neurath and Cohen, op. cit., p13.

46. Wolfgang Schumann, 'Memories of Otto Neurath' in Neurath and Cohen, op. cit., p15.

47. Otto Neurath, 'Letter to Josef Frank', Nadar Vossoughian (trans), Vossoughian, *The Global Polis*, 102.

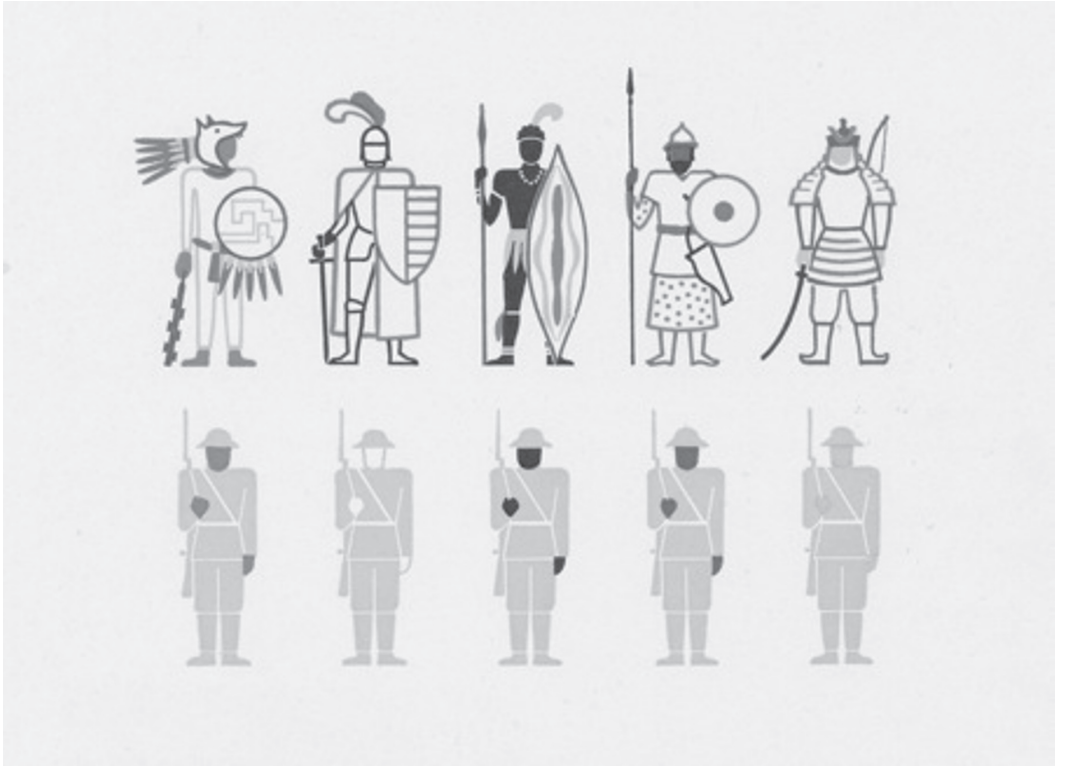
48. Frank, 'Flippancy', cited in Blau, *The Architecture of Red Vienna*, 196.

49. Josef Frank, 'Der Gschnas fürs G'müt und der Gschnas als Problem', ['Frippery as the comfort of the Soul and Frippery as a Problem'] in *Deutscher Werkbund, Bau und Wohnung*, exhibition catalogue, Stuttgart, Akademischer Verlag Dr Fr. Wedekind, 1927, pp48-57.

1930s this use of conventionalised skin colour to refer to national and ethnic difference was still commonplace, and, despite its roots in the hierarchical racial schema inherited from the nineteenth century, it was seen by Neurath and his colleagues as a solution to the problem of depicting difference through 'folkloric dress', which Neurath was informed was offensive to people of the different nations. Progress and equal status were associated with modern dress. In this particular chart, homogeneity of costume distinguishes the modern row of figures from the historical one. Yet, battle-dress is not simply costume - it is also equipment, technology. The greater variety of the top row of figures, showing differences in shields, weaponry and headdress for example, might be regarded as visually more engaging than the sameness of the figures below. However, the accompanying text is unequivocal in its explanation of the disadvantages of this variety:

> On the battlefield victories are won by the most highly developed war equipment. Whatever the social order may be, a knowledge of war technology is the common possession of all nations today. Cheap armaments and badly fed soldiers do not win battles. Mankind disposes of

FIG 4: Detail from Otto Neurath, Modern Man in The Making *(1939). Otto and Marie Neurath Isotype Collection, Department of Typography & Graphic Communication, University of Reading.*



better equipment, planning and better methods for killing and tormenting fellow-beings than for making life and living conditions secure.[50]

What appears as colourful variety turns out to be technical disadvantage on the modern battlefield, exemplifying the way social-technical planning has been misdirected toward death instead of life. This technical disparity had facilitated the European conquest of Africa, since African shields made of animal-hide, designed for battles fought with spears, provided poor protection against the bayonet and the horse. In this context, the development of a modern uniform style for Isotype may be seen as more than a functional choice, concerned solely with legibility and clarity. It is also a symbolic and strategic commitment to the equitable distribution of technology and planning for the improvement of life and living conditions. Uniformity of appearance was understood as anti-hierarchical, and democratic. Before the second world war, standardisation was often understood as an aspect of the democratising potential of modernity, a means of combating traditional hierarchy and social inequalities, both symbolically and practically. Equating domination with standardisation and Fordism became more common as the Fascist and National Socialist adoption of rationalisation and standardisation became evident. After the war, many modernist designers and artists, including Frank, repudiated their own earlier insistence on a uniform style, as something now tainted by association with Fascism and Nazism.[51]

Although in their final visual appearance they appear uniform, it is evident from Neurath's correspondence that Isotype charts were produced as assemblages, through an assiduous process of consultation, drawing on a wide range of expertise, and diverse perspectives drawn from different fields. At the *Gesellschafts-und Wirtschaftsmuseum* this took the form of an *Academie* of experts at the museum. Later, in the Netherlands and Britain, it was via a large network of dispersed informal contacts and consultants, as well as paid researchers. This practice of assembling diverse elements into a unified whole is consistent with Neurath's other work. For instance, he argued in the Cambridge lecture for the importance of diverse perspectives in social planning, rather than imposing a totalising view. On his Unity of Science work, he had to defend himself against Horace Kallen's accusations that the unified science was 'absolutist' and in league with totalitarianism.[52] Neurath argued his vision was a pluralist one - he had no intention of constructing a total system. He acknowledged that scientific disciplines operate according to different, contradictory principles. But the crux of scientific 'unity' is that all sciences could be discussed using everyday language, 'the everyday language which we use when we talk of cows and calves'. For Neurath, this is a democratising move - what can be known by scientists should also be explicable to anyone, and he cites Itelson, 'What one cannot explain in principle to a taxidriver in his language must be somewhat twisted'.[53] Neuraths model for construction was the encyclopaedia, an ongoing project of collating and orchestrating which is never complete, a model which drew on d'Alembert and Diderot's eighteenth-century example.

50. Otto Neurath, *Modern Man in the Making*, New York, Alfred A. Knopf, 1939.

51. See Christopher Burke's epilogue to *Active Literature: Jan Tschichold and New Typography*, London, Hyphen Press, 2007, and Christopher Long's discussion of Frank's post-war anti-style of 'accidentalism' in Long, op. cit..

52. On Kallen's accusations, see George A. Reisch, *How the Cold War transformed the Philosophy of Science: To the Icy Slopes of Logic*, Cambridge UP, Cambridge and New York, 2005.

53. Otto Neurath, 'The Orchestration of the Sciences by the Encyclopedism of Logical Empiricism', *Philosophy and Phenomenological Research*, 6, 4, (1946): 499-500.

By the mid 1930s, Neurath had also rejected the idea of a symbolic language that could absolutely eliminate the problems arising from the ambiguity of natural language.[54] In 1928 Carnap had published *The Logical Construction of the World* (the *Aufbau*) in which he conceived of a coherent system of scientific knowledge, built out of simple, empirical perceptual elements and therefore 'transparent' because directly traceable back to such statements. In this way, epistemology might establish itself on a scientific basis and rid itself of historically accumulated, metaphysical baggage. Isotype's visual construction seems to echo this. Like the Bauhaus use of geometric elements (triangle, circle, square), Galison suggests, Isotype was 'essentially a linguistic and pictorial form of transparent construction', since 'Out of simple pictorial elements such as a machine, a worker, or coal, one could construct standardised representations of the distribution of industry, housing, and other aspects of material life'.[55] However, according to recent scholars, despite his early enthusiasm for eradicating terminology he saw as metaphysical or theological, Neurath took the view that linguistic ambiguity made communication possible by enabling stable discourse.[56] He stated, 'The fiction of an ideal language constructed out of pure atomic sentences is no less metaphysical than the fiction of Laplace's demon'.[57] The basis of science has to be *Ballungen*, common and imprecise 'verbal clusters' or congestions that we use in everyday life: 'We always start from historical, natural language. Its sentences are *Ballungen*, and that means mixtures of forms of expression (precise and imprecise concepts)'.[58]

When Otto and Marie Neurath promoted Isotype as a 'picture language', they emphasised its limitations, its inability to deal with emotional content, its supplementary role. Neurath explained, 'the picture language is an education in clear thought - by reason of its limits'.[59] In 1944 he wrote, 'I always maintain the limitations of all visual aids … I object to attempts to look at Isotype as a quasi-language in full-dress. It is just my point to maintain that Isotype is adapted to impressive presentation of relatively simple correlation. A full scheme of hieroglyphics should frighten me … '[60] In *International Picture Language* he argued that picture languages,

> are based on our knowledge of the things themselves, putting weight on what ever seems important. Ideas of what is important are not the same at all times or in all countries … Certainly the ISOTYPE signs are dependent on their time like all these old sign-languages. Later times will see what their special qualities are and what the conditions were which made them'.[61]

While Isotype signs are empirically grounded, they are still culturally and historically specific interpretations. Isotype draws on a common symbolic vocabulary, pilfering from a wide range of different sign systems including well-established historical symbols. The ancient Egyptian wall paintings that Neurath knew from his visits to the *Kunsthistorischesmuseum* in Vienna provided a model of clarity and colour, for ways around the complex naturalistic

54. See Thomas E. Uebel, *Overcoming Logical Positivism from Within: the Emergence of Neurath's Naturalism in the Vienna Circle's Protocol Sentence Debate*, Amsterdam, Rodopi, 1992.

55. Peter Galison, op. cit., pp749 and 723.

56. Angela Potochnik and Audrey Yap, 'Revisiting Galison's "Aufbau/Bauhaus" in light of Neurath's philosophical projects', *Studies in the History and Philosophy of Science*, 37 (2006): 477. doi:10.1016/j.shpsa.2005.11.001

57. Neurath, 'Protocol sentences' in A. J. Ayer (ed), *Logical Positivism*, New York, The Free Press, 1959, pp199-208.

58. Otto Neurath, cited in Cartwright et al., op. cit., p195. Here, and in Potochnik and Yap's essay, the concept of Ballungen in Neurath's work is introduced and discussed in depth.

59. Otto Neurath, *International Picture Language: The First Rules of Isotype* Psyche Miniatures, London, Kegan Paul, 1936, p22.

60. Otto Neurath letter to R.W. Moore, May 23, 1944. Isotype 1/10-11 in the Otto and Marie Neurath Isotype Collection.

convention of perspective, and for a symbolism derived from 'living life' (as Neurath put it) rather than ritual or religion. Neurath also explained that colour in Isotype was used according to common-sensical associations 'adapted to popular usage'.[62] In this way, Neurath hoped that Isotype might gain, not absolute clarity, but something of the legibility and stability of *Ballungen*.

In 1947, Marie Neurath wrote to a correspondent that while Isotype should be easily understood, 'the writing of it was a very responsible and difficult job which can only be carried out by a group of experienced persons.[63] Isotype, in her view, was a developed and thoroughgoing practice rooted in experience worked out over two decades, hers as much as Otto Neurath's. Its flexibility and usefulness depended on this recognition of it as a practice, not a code that might be 'cracked' nor as a set of finished stylised artifacts. As a practice, Isotype intersected with a wide range of other practices, and participated in social change, as well as operating as a means to enable its users to develop new conceptual and perceptual practices. Peter Galison and Lorraine Daston have argued that scientific practices operate at the level of an individual, as 'techniques of the self' that discipline and orient attention, and create the conditions for certain kinds of (valued) thought.[64] Cultural production also involves techniques and rules that orient attention in specific ways and facilitate practice. In Isotype this would include (for instance) the restricted range of colours used and their rules of combination, and the maxim that quantity should be indicated through multiple identical pictograms, rather than through differences in scale or volume.

Clearly Isotype did tend toward standardisation, uniformity, the methods associated with quantitative social science and social planning. Yet these techniques and regimes that facilitate the practice of making and interpreting Isotype charts were not attempts to impose a singular way of life, nor was the discipline needed to produce the charts a discipline imposed on its readers. Isotype was part of social planning and education, a practice that proceeded on the basis that what knowledge we have can be accessible to everyone if it is expressed clearly enough. Neurath and his colleagues did not believe that uncertainty, ambiguity and everyday muddle were intolerable, or assume the world was entirely knowable. Architecture, planning and Isotype were, for Neurath, not about shaping the new way of life (singular), in accordance with the demands of industry or the mass society, but about enabling plural, co-existent ways of life.

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61. Neurath, *International Picture Language*, p106.

62. Otto Neurath, *From Hieroglyphics to Isotype*, draft in the Otto and Marie Neurath Isotype Collection, Department of Typography and Graphic Communication, University of Reading; Otto Neurath in Nemeth and Stadler, op. cit., p320.

63. Marie Neurath to Philip Dingle, March 27,1947, Isotype 1/1-5, the Otto and Marie Neurath Isotype Collection.

64. Lorraine Daston and Peter Galison, *Objectivity*, New York, Zone Books, 2007.