Information Design Journal 10(2), 133–143

© 2000/2001 John Benjamins Publishing Company

Nigel Holmes

Pictograms: A view from the drawing board or, what I have learned from Otto Neurath and Gerd Arntz (and jazz)

Keywords: graphical symbol, icon, pictogram.

This article sets out to discuss the practical development of pictograms and the thoughts that lead to their final visual shape. It explains the personal considerations that combine all issues that are related to making graphics, such as drawing, technique, conventions, and commercial aspects. The article explains how ISOTYPE and its designer Gerd Arntz influences current day-to-day work. By drawing parallels with jazz, different approaches to drawing graphics are shown and explained.

Introduction

I have been designing and drawing Information Graphics (although I prefer the term Explanation Graphics) for 35 years. During this time I've drawn about 1,000 pictograms. They fall into two broad categories. The first includes sets of formally related icons – for example, sports symbols for the radio and TV program pages in Radio Times in England (drawn in 1969–78) (Figure 1), or subject icons for The Mexican Yellow Pages (drawn in 2001) (Figure 2).

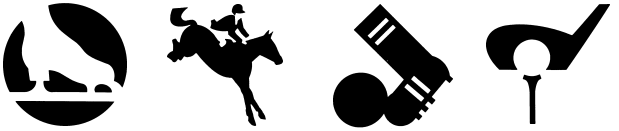

Figure 1.



Figure 2.

The second broad category includes individual icons or small groups of them drawn for specific explanation graphics. When I started to look back at my own work, I found hundreds of icons in this second group (Figure 3), and I think it's safe to say that all information/explanation designers have drawn (or used) icons in this second category without even thinking about it. We regularly use icons as substitutes for certain words or ideas (Figure 4). When Otto Neurath called his International System of Typographic Picture Education (Isotype) a 'helping language' (rather than a complete visual substitute for a written language), he was suggesting what today is taken for granted in this field: words and pictures together make better explanations than words alone, or pictures alone.



Figure 3.



Figure 4.

Despite some references to, or even emphasis on the work of past masters such as Neurath, his wife Marie, and their star artist/designer Gerd Arntz, this essay does not set out to be an academic or a historical review of pictogram design; it is not comprehensive about the subject, nor even particularly impartial. It is one artist's thoughts about pictograms, icons, symbols[1] and the process of making them.

I listen to jazz (not when I am drawing, it's too distracting), and I'm probably not the first to note some parallels between the creation of jazz and the creation of art. From time to time I include an observation about jazz in this article that might help readers understand the point I'm trying to make about the creation of pictograms.

Balancing art, science and the market

When drawing pictograms, I must find a balance between the art of drawing in its freest sense (hand-on-paper) and the more mechanical means of producing marks (either hand-on-paper with a french curve or ruler; or hand-on-



Innsbruck Lillehammer Albertville
Figure 5.

mouse); between a human approach and a robotically systematic one; between wiggly lines and straight lines; between the Lillehammer and Albertville Olympic symbols on the one hand and the gridded, Aicher-inspired organization of the Innsbruck Olympics symbols on the other (Figure 5).

Designing individual icons that are going to be part of a complete set presents an additional constraint, because sometimes icons that represent objects have to be part of a system that includes icons representing actions.

Various conventions will hold a group of symbols together. Among them are:

– the overall shape, including: round (Figure 6.1), square (Figure 6.2), implied square (Figure 6.3), diamond (Figure 6.4)



Figure 6.1.

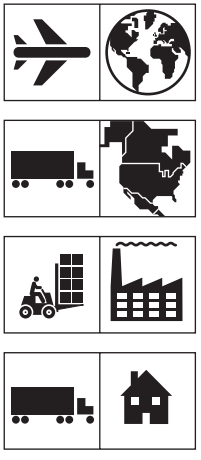

Figure 6.2.



Figure 6.3.

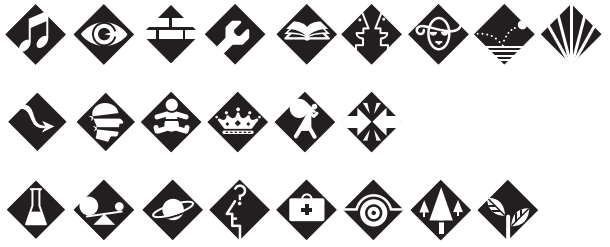

Figure 6.4.

– the style of the drawings, including: uninterrupted single line (Figure 7.1) white line on a black background (Figure 7.2)
– the subject matter, for instance: animals (Figure 8.1), children (Figure 8.2), washing machines, car dashboards, etc
– the context in which they are seen (Olympic games, zoo, washing machines, etc)
– color

Olympic icons employ all of these conventions at the same time.

In addition to these internal considerations (how do I get the images down on paper?), there are external, commercial considerations. Few artists are able to make icons without art directors and clients who have their own ideas about the look or feel of an icon set. Thus a 'modern look', or a 'retro look', or a 'metallic look' might be suggested at



Figure 7.1.



Figure 7.2.

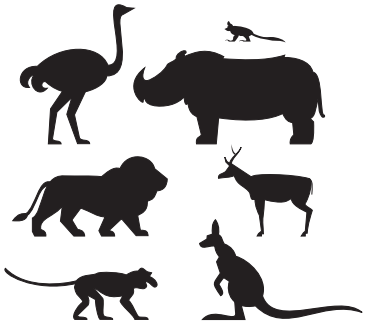

Figure 8.1.



Figure 8.2.

the start of a job – not the kind of direction that I like to have, but understandable in this time of proliferating media outlets trying to differentiate themselves from one another. Makers of symbols might understand Marie Neurath's wish that symbols be established and then left unchanged, but we cannot hope to achieve this until we are our own client, writing our own 'language' for our own projects. Actually, the more icons I do, the more I find that I am establishing a kind of personal visual language, and that I can replay some of it in widely different applications for different clients, but in general, clients want every item to be new and custom-built for them – images they can call their own.

When trumpeter Louis Armstrong first joined King Oliver's band in Chicago he was already well-known for his extraordinary talent, but he had to tone down his 'voice' because there could only be one leader – Oliver, and he played the trumpet too. Only when Armstrong became the leader of his own band was he able to design music that he could call his own. This is not to say that music or graphic design is made by one person operating alone – it is a collaborative venture. Jazz, especially small group jazz, depends on the interaction of the players, each listening carefully to the other and responding to the sounds. But commercial considerations often get in the way of what one wants to do, even in the way of what one really thinks is the right thing to do.

So these factors are swirling around in the mind while the artist works on an icon or a set of icons:

– the act (and art) of drawing versus a mechanical product
– a systematic approach that binds a cohesive set of icons versus the freedom to do effective individual icon
– the constraints of the marketplace versus doing what you want to do

A word about style

Designers and artists have been criticized for looking at the surface appearance of Arntz's work and copying its look without understanding the principles of the system that Neurath was advocating. The Isotype system was much more than a dictionary of visual symbols which could be selected and arrayed in lines to show, for instance, the difference between one commodity and another over a period of time (Figure 9). A key part of the Neurath's Isotype method was his precise method of assembling icons into statistical charts. While Neurath knew the value of pictures as a way to get people interested in what he was teaching them, he was also aware of the charting pitfalls that went with pictures (Figure 10). He used the term 'statistical accountability' to describe his approach. He and Arntz designed icons that could be used next to one another in rows, could stand for quantities and thus be 'accountable'. The spacing between these 'characters' was critical so that a naturally narrow object (a herring) could be seen to have the same visual weight as a naturally fat object (a barrel) (Figure 11).

In 1979, Arntz published a collection of his icons from various times in his career, in a kind of visual dictionary, and this may have muddied some of the purity of Neurath's

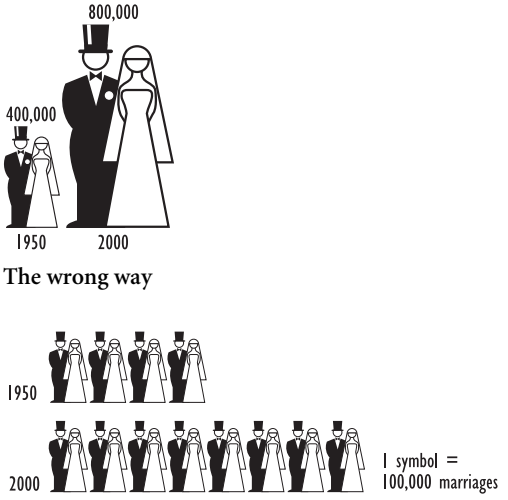

Figure 10.

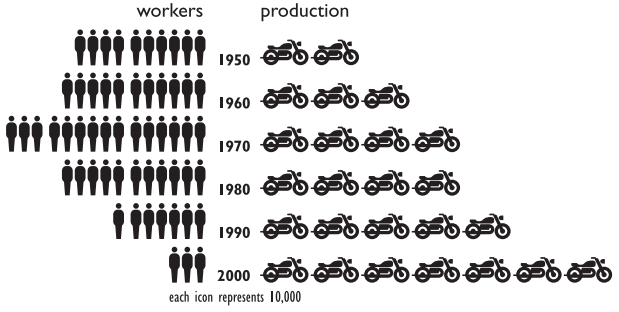

Figure 9.

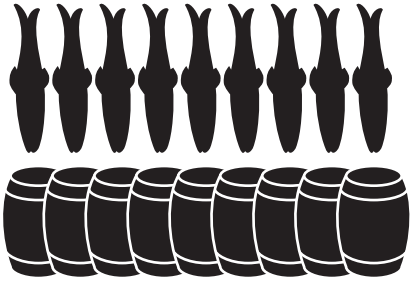

Figure 11.

ideas about how they should be used. Likewise, Rudolf Modley's *Handbook of Pictorial Symbols* is a nice cheat-sheet of easy-to-copy images, and although it does include a brief explanation of the systemic thinking behind the use of icons, the title clearly states the intention of the book. (Modley, an American, worked with Neurath in Vienna from 1923 to 1930.)

Nevertheless Arntz made wonderful drawings, and they remain great lessons in how to draw pictograms. While some of the images may look dated (cars, telephones), his drawings of people are amazingly expressive, yet are made with the fewest marks possible (Figure 12) – Arntz was an artist first, then a designer. Neurath recognized that Arntz's talent for capturing the essence of an object with such economy of form might enable him to explain the world to others (or at least to the Viennese) by using a picture language.

Artists do look at surface style and want to imitate it – we learn that way. Gerd Arntz's son Peter showed me his father's collection of art books, and told me that his father was influenced by primitive art – the cave paintings from Lascaux, for example. Most art comes from other art: a reaction, a development, an improvement. Whether we like it or not, we are influenced by what we can see, long before we understand the original intentions. There's nothing wrong with that.



Figure 12.



Figure 13.

When designers imitate just the look of an Isotype chart, even if the original underlying 'system' is not strictly adhered to, we give our graphics only the 'feel' of information design. We fool ourselves if we do not admit that this kind of copying happens. But what we are doing is producing decoration, not information design. It is a sort of salute to the language that Marie and Otto Neurath developed with Arntz and others, but those who don't follow Neurath's rules cannot really 'speak' his language so that readers can understand it. Same thing in jazz: when saxophone players (that is, those who wanted to be part of the bebop scene in 1945) first heard Charlie Parker's sound, they all wanted to play exactly like him – in fact they felt it was the only way to play. Parker showed jazz musicians what bebop was supposed to 'sound' like. But copying the sound was not enough. Musicians had to understand the principles behind what Parker was doing in order to take their music to the next step – being able to make their 'own' sound. Designers can signal 'information design' by the surface appearance of our work. But we must deliver the information too, otherwise we can rightly be criticized for publishing meaningless 'datajunk.' I've had plenty of academic tomatoes thrown at me (Figure 13).

How to draw: Three approaches

Geons

Cognitive scientists have tried to explain what's going on in our heads when we look at things. One theory posits that



Figure 14.

there is a set of shapes stored in the brain which we refer to whenever we look at an object. In a flash, we unconsciously compare the overall shape of the seen object with the checklist of smaller component shapes already in our brains. When we put the small shapes together, we recognize what we are looking at. The scientists David Marr and Irv Biederman call these component shapes 'geons' (Figure 14). Their theory of how we recognize things corresponds with one way that artists are taught to draw: break down the thing in front of you (or in your mind) into basic shapes, and build a drawing from those shapes.

It's a good way to approach drawing symbols – much better than Paul Klee's definition of drawing as 'taking a line for a walk'. In the drawing of a microscope (Figure 15), a line has been traced, or taken for a walk around it.



Figure 15.



Figure 16.



Figure 17.

But if instead of doing this you draw by using building blocks or shapes (geons), you'll start to think about what the object is, rather than what it looks like. So you won't be drawing what you see (either in front of you, or in your memory), as much as drawing what you know about an object. The microscope in Figure 15 could be thought of as being made of 5 geons (Figure 16). When the shapes are fitted together they make a 'better' icon of a microscope than one made by a line wandering around its edges (Figure 17). Incidentally, the result might also give the viewer an idea of how a microscope works, because the shapes break it down into its component parts. In the same way, you'd draw a pictographic car with the wheels separated from the body, rather than as blob-like protrusions sticking out of the bottom of it (Figure 18). Often we get bogged down with detail when trying to draw pictograms. When you are very familiar with an object (scissors, car, tree) it's better not to consult any direct visual reference, such as a photograph, but rather just to



Figure 18.



Figure 19.

think about what you are drawing. That way you can get at the essence of the thing – either its function or its appearance. If you are not familiar with an object you might want to look at a picture and then apply the geon method.

Here's Neurath's practical advice about how to reduce the appearance of an object to its essence:

– use art materials that force you to simplify the marks you make. (Prior to seeing Arntz's linocuts, Neurath got his artists to cut images out of black paper with scissors).
– draw the object as a silhouette (Figure 19)

Silhouettes

There is something about the silhouette that has a dispassionate, scientific authority. Ellen Lupton describes silhouettes as 'a kind of pre-chemical photography... an indexical image made without human intervention, a natural cast, rather than a cultural interpretation.' (Figure 20). I try to find the most representative view of an object. That is almost always a straight-on view rather than from an angle; sometimes a side view is the best, sometimes a front view (and sometimes that's the same thing; look at a wineglass). However, compromises are necessary – a true side-on view, or profile, of a pair of spectacles does not remind you of spectacles, it's just a capital letter J on its side.



Figure 20.

What makes Arntz's work so interesting to artists is that, despite the impartial, scientific bent that Neurath wanted his system to have, Arntz's drawings – the most visible part of the Isotype system[2] – were anything but cold and mechanical. It was not the kind of work one might expect from a kit-of-parts approach. What he left out was as important as what he included. Jazz again: in contrast to Charlie Parker's torrent of musical notes, pianist Thelonius Monk, according to Lewis MacAdams in Birth of the Cool, created 'an art of implication.' Monk left spaces in his music which the listener naturally filled in, just as we do when looking at an Arntz pictorial icon. (Figure 21)

Observation

There are many ways to draw pictograms, and there should be no hard and fast rules. Drawing with geons is just one way. It's a left-brain approach. For a moment, I'll argue on behalf of the other side of my brain, the right, the artist. (This is the balance I mentioned at the beginning). For me, using geons rigorously and right at the start of a project does actually tend to make the finished work a bit mechanical, although at times that can be OK – see the microscope example in Figure 17 – or even intentional.

I got considerable help from my computer in creating the digital look of the office stationery icons in Figure 22. At other times, when drawing humans, for instance, a less geometric approach seems to give better results. This can be seen in the difference between Otl Aicher's 1972 Munich Olympic symbols and those of Keith Bright for Los Angeles in 1984 (Figure 23). Bright softened the mechanical quality of the earlier set by showing little bulges for muscles in the arms and legs.



Figure 21.



Figure 22.



Otl Aicher



Keith Bright

Figure 23.





Figure 24.

To keep the balance between a geometric interpretation of an object or a person and a freer rendering, I'll often start with lots of tiny hand-drawn scribbles (Figure 24), then gradually apply shape-thinking as a way to help me get to the essence of the object. The use of geons pushes me towards a clear image. It is a bridge between my intuitive vision of something and a symbolic representation of it. Having a healthily split personality (a true mix of left- and right-brain attributes) is the best state of mind to be in when designing symbols: it's part analysis, part art.

The mind and then the machine

Only when I have a good sketch of the image I want to end up with, will I start to use the computer – never before. 'Drawing' with a computer is a very unnatural process, whatever claims the makers of popular drawing applications may make to the contrary. There is a particular look to computer-generated graphics, and you can tell when an artist has allowed the application to take over from his or her intentions. If we don't pay attention while using the computer, the result is transparently obvious – it looks as though the machine has done the work, using the formulas already stored within it. The trouble is, we may sometimes like what it produces, and be initially satisfied with it; we have then either been seduced by the machine's slick graphics application, or we're just lazy. It's wrong to think that computers will hide bad drawing – they just make bad drawing look slicker. I think that using the hand to sketch remains the foundation of this work, and the proof of that is in the warm, human emotion you get when you see a beautifully produced symbol, however small it may be, and however much you take it for granted because it's just a traffic sign or a small part of a diagram. I'm not against computers – everything I do is eventually produced on the Mac. But I use the machine primarily to pare down an image, to find the most economical way to represent something, to take things away rather than to build up an image by adding extraneous (and all-to-easily produced) effects. Listen to trumpeter Miles Davis's earlier work – that unmistakeable, simple sound. His pared-down simplicity did not make the sound generic. You can feel the person behind the notes. Later in his career, he did turn to electronics and in the process his trademark sound lost much of its personality.

Listeners are drawn to Davis's early work: spare, clear lines of melody, unfussy and without the helter skelter of notes that his fellow beboppers were playing at the time. In the same way, graphic symbols work best when they are simply conceived and executed (Figure 25). In both cases



Figure 25.

there is human pleasure in recognizing elegant simplicity through economy of means.

The picture/word mix

There have been well-documented attempts to make self-sufficient visual languages (Bliss, Ota). But while some airport and traffic sign systems aspire to form a wordless international language, most of the time it is a combination of words and pictures that make the best explanations.

Sometimes icons and symbols are used as tiny visual gifts in graphics; a little phone next to the phone number on business cards, or, in a block of text, a symbolic eye next to a page number to denote 'see page...'. It can be fun too; I put a snail next to the mailing address on my business card. It's not necessary, but it matches up with the mouth (representing voicemail, or phone), the fax machine icon and the computer icon for email and web addresses (Figure 26). Purists will note that 'snailmail' is hardly international, and could be meaningless to many people. Here's one place I'll let Neurath have his own opinion, and personally reserve judgement: he believed that a symbol should represent only what a thing looks like, not what it sounds like, nor should it ever be a play on words – all part of the cause of international understanding.



Figure 26.

Now that the world seems to be becoming one big, undifferentiated culture, a little movement in the other direction, towards preserving differences, might be a relief. I believe that it is rather exciting to be slightly baffled by foreign languages, because you'll learn something while you are figuring out the meaning (I don't want to do it while rushing to catch a plane, of course). I'll end with some examples of storytelling that may or may not 'translate' well. (Figures 27–29)

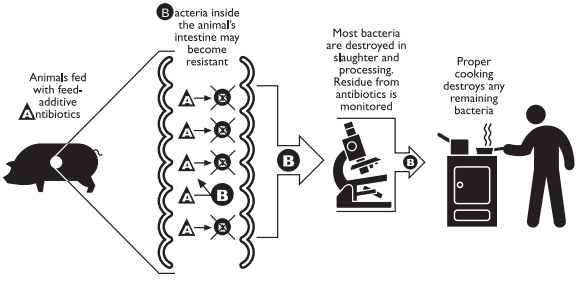

Figure 27.



Figure 28.

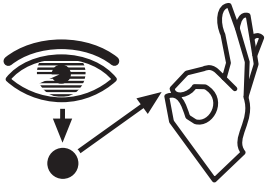

Figure 29.

Notes

1. For this essay, I use the terms pictograms, icons, and symbols to mean the same thing; I'm not adhering to Edward Doré's definitions from IDJ, volume 2/2, 1981, or Stuart Mealing's list in Do You See What I'm Saying?, a chapter from Iconic Communication, edited by Masoud Yazdani and Philip Barker, 2000.

2. There were other artists working with Neurath; among them were Augustin Tschinkel and Erwin Bernath.

References

Arntz, G. (1988). *De tijd onder het mes: hout- & linoleumsneden 1920–1970*. Nijmegen: SUN.

Arntz, G., Broos, K. (1979). *Symbols for Education and Statistics, 1928–1965*. Amsterdam: Mart Spruijt Uitgeverij.

Edwards, J.A., Twyman, M. (1975). *Graphic communication through ISOTYPE*. Reading: University of Reading.

Holmes, N. (1985). *Designing Pictorial Symbols*. New York: Watson-Guptill.

Holmes, N. (1998). *Drawing to Explain*. Private publication.

Kinross, R. (1981). On the influence of Isotype. *Information Design Journal*. volume 2, number 2. pp. 122–130.

Lupton, E. (1989). Reading Isotype. pp 145–156. In: Victor Margolin (Ed.) *Design Discourse*. Chicago: University of Chicago Press.

Lupton, E., Abbott Miller, J. (1996). *Design, Writing, Research*. New York: Princeton Architectural Press.

Modley, R. (1943). *A History of the War*. New York: Penguin Books.

Modley, R. (1976). *Handbook of Pictorial Symbols*. New York: Dover.

Neurath, O. (1933). *Modern man in the making*. New York: Alfred A. Knopf; London: Secker and Warburg.

Neurath, O. (1936). *International picture language*. London: Kegan Paul.

Pinker, S. (1997). *How the Mind Works*. New York: W.W. Norton & Company.

Yasdani, M., Barker, P. (Eds.) (2000). *Iconic Communication*. Exeter: Intellect Ltd.

ABOUT THE AUTHOR

Nigel Holmes does explanation graphics.
Nigel@nigelholmes.com
www.nigelholmes.com

All pictograms, except for figures 5, 12, 21 and 23 were drawn by the author.