

Price of this issue 2.00 US dollars

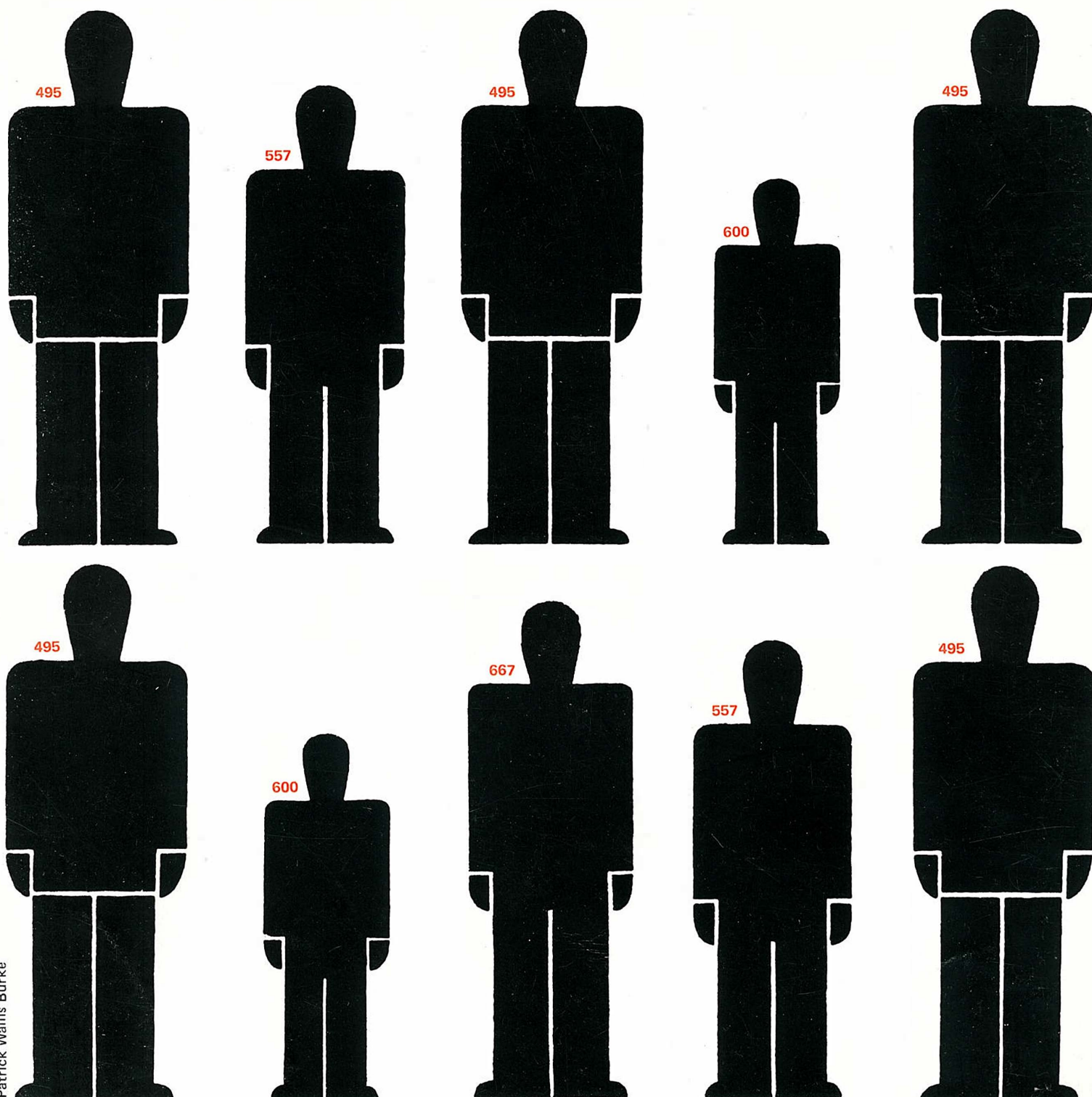
Published in London by the
International Council of Graphic
Design Associations

Contents include

The significance of Isotype
Isotype in the USA
Bauhaus and grandson of Bauhaus

Towards a more consistent
English spelling
Towards a new alphabet
First steps on a thousand mile
journey—part one

Design education and
standardization
Problem solving in the man-made
environment
Traveller's symbols





Executive Editor

Patrick Wallis Burke

Contributors to issue number 10

Peter Bartl
Patrick Wallis Burke
J J Dames
Dick Feigler
Ernest Hoch
Thomas R Hofmann
Mohan S Kala
Robert A Manning
Michael McCoy
Michael Twyman

Published twice-yearly by

The International Council of
Graphic Design Associations
all correspondence to
7 Templeton Court
Radnor Walk, Shirley
Croydon CR0 7NZ, England

Paper supplied by courtesy of

Culter Guard Bridge
Salisbury Square House
Salisbury Square, London EC4
Cover printed on
Hi-Fidelity Art Board 280g/m
Text printed on
Hi-Fidelity Art Paper 118g/m

Printing of issue number 10

Pan Litho Limited
246 Kilburn Lane
London W10, England

Design and layout of issue number 10

Patrick Wallis Burke

Acknowledgements to

School of Graphic Design
Ravensbourne College of
Art and Design

Subscription rates

Countries within Europe
Subscription rate for 2 issues
(including postage)

US Dollars 2.50

Countries outside Europe
Subscription rate for 2 issues
(including postage 2nd Class Airmail)

US Dollars 5.00

Recommended price per copy

1.50 Dollars (USA)
60p (UK)

Price of this special issue

2.00 Dollars (USA)
£1.00 (UK)

Subscriptions must include two issues.
Unless the publishers are notified
immediately after the appearance of
the second issue that a subscription is
to be discontinued, it will be treated
as renewed.

The text, or extracts from it, and
the illustrations, can only be
reproduced with the Executive
Editor's consent.
No responsibility for the loss of MSS,
photography or artwork can be
accepted.

This tenth issue of *icographic*
includes a number of contributions
from last year's successful *Edugraphic*
conference, held in Edmonton,
Canada—Icograda's first meeting on
the American continent.
A wealth of interesting material was
generated by this conference, not
only from the official platform,
but also in the many presentations
made to the various working groups.
In succeeding issues we hope to give
permanent form to a great many of
these contributions.
The *Edugraphic 75* symbol will be
used to identify these items.

And with this issue, *icographic* itself
reaches a small landmark, since it
has now got into double figures.
To mark the event we have given it
an additional 8 pages.

The significance of Isotype

Michael Twyman

The author discusses the pioneer
work of Otto Neurath and his Isotype
team. Neurath saw the need to
establish conventions for picture
language in order to make communi-
cation easier and more effective.
Obviously, the major influence of the
Isotype movement is seen most
clearly in the field of graphic
statistics but they also offered some
important lessons in the way they
approached communication problems.

Isotype in the USA

As a brief supplement to Michael
Twyman's article, we show some of
the symbols designed in the United
States by Pictorial Statistics
(an American offshoot of the Isotype
movement) in the 1930s.

Bauhaus and grandson of Bauhaus

Robert A Manning

The author outlines the history of the
Institute of Design at Illinois
Institute of Technology, from its
founding in 1937 under Moholy-Nagy
up to the present time. He reassesses
the original Bauhaus approach to
design and describes the many
changes in emphasis that have taken
place at the Institute. He also
contends that, in spite of these
necessary changes, the Institute of
Design still represents a thriving,
legitimate offspring of the original
Bauhaus founded 56 years earlier.

Traveller's symbols

Thomas R Hofmann

The author believes that opportunities
are being lost for a more painless
introduction of international symbols
for the traveller. He discusses why he
thinks that graphic symbols should
not be allowed to stand mute without
some form of explanation as to their
meaning.

Towards a more consistent English
spelling

J J Dames

The author, a Dutchman who has
spent most of his life in Africa,

discusses the problems of English
spelling. He provides a timely
reminder that the problems of English
orthography should no longer be the
sole concern of those who speak it as
their mother tongue. Because of its
primacy as a second world language,
millions of people from all cultures
are vitally interested in how its
spelling might be reformed.

Towards a new alphabet

Mohan S Kala

Everyone is agreed on the need for a
new set of alphabetic symbols that
are both man and machine amenable.
The author, who has been doing
research in alphanumerics and metro-
logy, claims that his *Fondijyal*
system fulfils both requirements.

The age of the symbol manipulating
sensory cripple

Peter Bartl

The author presents some arguments
for an education that gives as much
attention to a child's visual sensory
development as it currently gives to
reading and writing.

First steps on a thousand mile
journey—part 1

Patrick Wallis Burke

My own contribution is the first part
of a longer article designed to give
some descriptions of the Chinese
writing system. My hope is to show
that the Chinese written language
offers the graphic designer some
important insights into the nature of
pictorial communication, and also
forces one to consider the gains and
losses of alphabetic writing.

Design education and standardization

Ernest Hoch

The author argues that for the student
designer an understanding of the
nature of standardization is vital.
Standardization, far from being a
break upon creativity, is a necessary
prerequisite for any student who
wishes to act responsibly as a designer.
The concept of standardization
touches upon the fundamental
question of the relationship between
freedom and restriction upon it,
between creativity and a framework
of constraints.

Problem solving in the man-made
environment

Michael McCoy

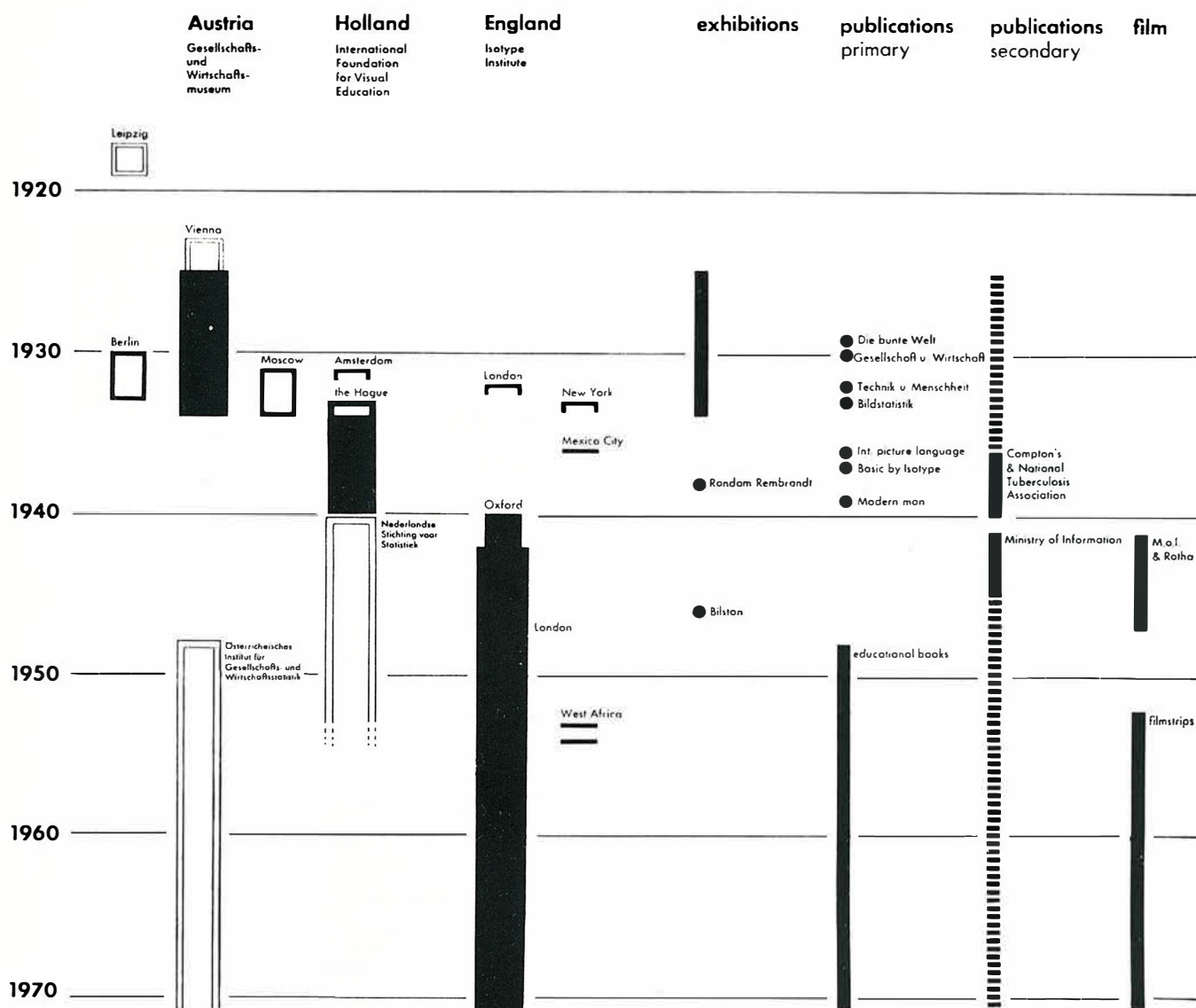
The author describes an environ-
mental Education Project undertaken
by graduates and staff of Cranbrook
Academy, USA. The project involved
the design and development of a
curriculum and supporting teaching
aids, on the theme *The man-made
environment*. It is intended for use
in the grades 6-9 in the state
education system.

Executive Editor

This article is reprinted with minor alterations from the catalogue of an exhibition entitled Graphic Communication through Isotype, which was held in the University of Reading, during May to October 1975. It attempts to make an assessment of the significance of the Isotype approach to graphic communication from the standpoint of graphic design today.

The historical development of Isotype and the work produced by Isotype design teams are discussed in other sections of this catalogue which is available at price £1.25 plus postage from the Department of Typography and Graphic Communication, University of Reading, 2 Earley Gate, Reading, England

Michael Twyman also presented an illustrated lecture on the Isotype Movement to the Edugraphic 75 conference in Alberta, Canada. Since this relied heavily upon slide-presentation, we have chosen this article as being more appropriate to the needs of this journal



The diagram above seeks to give a chronological picture of the periods and locations of the Isotype Movement, as well as the form which such work took

The significance of Isotype

Michael Twyman

Michael Twyman is head of the Department of Typography and Graphic Communication at the University of Reading, where he was responsible for introducing the first degree course in the subject in a British university. He is currently Chairman of the Education Committee of ATypI (Association Typographique Internationale)



It is fifty years since the founding of the Gesellschafts- und Wirtschaftsmuseum in Wien, a museum which was set up by Otto Neurath to explain to the general public of Vienna something about the social and economic issues of the day. This museum was the public arena in which the Vienna Method of statistics was developed, and out of it grew Isotype (International System of Typographic Picture Education). It was also fifty years ago that Marie Neurath (nee Reidemeister), the longest working member of the Isotype team, began work at the Gesellschafts- und Wirtschaftsmuseum in Wien. It is a stroke of good fortune that an exhibition based on the Otto and Marie Neurath Isotype Collection, which was deposited in Reading University Library in 1971, could be organised in time to record this joint anniversary.

There is no shortage of information on the Neuraths and Isotype: some of those involved with the development of Isotype are still very active and, as a glance at the bibliography will reveal, much has already been written on the subject. This short essay attempts to do no more than draw attention to some of the most significant aspects of Isotype from the standpoint of the graphic designer. Those interested in Otto Neurath as a person and in his social and philosophical ideas are recommended to read Otto Neurath, *Empiricism and sociology*, edited by M Neurath and R S Cohen (Dordrecht, Holland and Boston, USA; 1973).

The term Isotype Movement has been used in connection with this exhibition to describe the activities and influence of Otto Neurath and his team and, after his death in 1945, those of Marie Neurath. This term is not altogether satisfactory, but since the word Isotype was not coined until the mid 1930s it is not strictly correct to use it on its own in relation to work produced before this time in Vienna and elsewhere. Seen from the standpoint of today the term Isotype Movement assumes an additional meaning because the principles of Isotype (or some of them) have been adopted by other designers, not all of whom have had direct links with Otto and Marie Neurath. On the other hand it should be stressed that those who worked with Otto Neurath in Vienna in the 1920s would hardly have seen themselves as forming part of any large-scale movement. The approaches to graphic communication adopted in Vienna were very much the result of the enthusiasm, intelligence and tenacity of one man, and it is only retrospectively that they can be seen as forming part of an Isotype Movement.

Graphic design stemming from social needs

One of the most interesting aspects of the Isotype Movement is that it was begun by someone who was not trained as a graphic designer or artist. It is true that Otto Neurath gleaned all he could at an early age from the illustrated books and prints in his father's extensive library, but his only formal training in drawing was a course in perspective—an aspect of pictorial representation which he specifically rejected in Isotype work. What Otto Neurath did have, though, was the foresight to engage as team workers such people as Marie Neurath and Gerd Arntz who had received some visual training and were receptive to his general approach.

The brief biography of Otto Neurath at the end of this article is sufficient to show that his formal education was primarily in the field of traditional academic subjects. When he was appointed director of a new Museum on War Economy in Leipzig towards the end of the First World War he would almost certainly have described himself—using the terminology of today—as a social scientist. It was in this capacity too that he became the General Secretary of a co-operative for one-family housing in Vienna and later, in 1925, director of the Gesellschafts- und Wirtschaftsmuseum in Wien. He therefore approached graphic design as it should be approached, as a means to an end rather than as an end in itself. The end as far as Otto Neurath was concerned was quite clear: to educate the people of Vienna and elsewhere in social and economic matters in order to pave the way for social change.

The Isotype Movement is, in my view, an excellent example of innovation in graphic design resulting from an attempt to meet social needs. A number of important developments in graphic design have stemmed from changes in society or attempts to change it, and have been associated with efforts to unify political or religious communities. Others have been associated with war and the need for efficient communication in battle—indeed, some of the most remarkable innovations in pictorial communication have been in maps, plans and charts designed for use in connection with war. But the Isotype Movement provides the best example I know of graphic design innovations stemming from the need for social reconstruction.

In Austria after the First World War there was much needing to be done. With the collapse of the old Habsburg Empire Vienna and Austria as a whole were in difficult straits. They were deprived of resources, there were shortages of food and housing which threatened to under-

mine public health, and inflation was running at an alarming rate. It is against this background that we have to see Otto Neurath's contributions to graphic design. He wanted to bring to the man in the street an awareness of the social and economic issues of the time in Vienna, and to draw attention to these by making comparisons between the present and the past and between Vienna and other cities. 'When a Viennese citizen enters this museum,' wrote Otto Neurath of Gesellschafts- und Wirtschaftsmuseum in Wien, '... he finds reflected his problems, his past, his future—himself. This does not mean that the museum limits itself to local interests; on the contrary, it provides the setting of world-historical relationships within which the individual discovers the decisive influences on his own fortunes. Take this matter of housing, for example; the aim is not to show what a particular building project looks like, but to help the citizen see the different types of homes that are included in the plan for the city's development, realize for what groups of the population these different types are intended, how they are going to modify the lives of people, to what extent they are going to help in improving health, reducing mortality—especially that of infants—and so on.' (1)

The central themes which concerned the Isotype Movement in its early days in Vienna—housing, health, social administration and education—were also taken up in later periods and other countries. Health education, for instance, was taken up on an international front in the 1930s with the major publicity campaign to combat tuberculosis which was promoted by the National Tuberculosis Association of America. The theme of housing was returned to after the second World War in England when Otto Neurath was involved with a housing project for Bilston Borough Council, and that of social administration in the charts explaining the Beveridge Plan and the campaign to show the people of the Western Region of Nigeria how their new Government and electoral system worked. The themes of Housing, health, social administration and education were, of course, inextricably linked with one another and many Isotype charts were designed to show such relationships. A common factor in all of them was education. The interest in education runs right through the work of the Isotype Movement over a period of fifty years, and Otto and Marie Neurath must be seen as important pioneers in the field of visual education in a period which, initially, was not particularly receptive to the idea of learning through the eyes.

To those who are not closely connected with graphic design it may seem self-evident that a designer

icographic 10, 1976, pp 2-10
Author's address:
University of Reading,
Department of Typography and
Graphic Communication,
2 Earley Gate, Whiteknights,
Reading RG6 2AU, England

should be concerned with fulfilling particular needs (and usually ones which have little or nothing to do with his desire to express himself); but this has not always been understood by designers. The significance of the Isotype Movement in this respect is that its members approached graphic communication with very clear objectives in mind and then set about trying to achieve them by a gradual process of trial and error. No passage in Otto Neurath's writing illustrates better his view that the designer should consider his responsibilities to society than a perceptive passage he wrote in connection with architecture in his book *Lebensgestaltung und Klassenkampf* (Berlin, 1928): 'The architect more than any other creative person must seek to anticipate the future. If he builds a house responsibly he must consider the changes of the immediate future, not only technical changes but also changes in the form of life.' (2)

Otto Neurath's belief in picture language

Otto Neurath made it quite clear in his writings that he saw picture language as an additional language—a helping language as he called it—to be used along with other languages according to circumstances. He recognised that there were some things that could not be said through pictures, and others that could be said only with great difficulty through them; but he also believed that in certain situations pictures could speak more clearly, and with a greater chance of their message being remembered, than numbers or words.

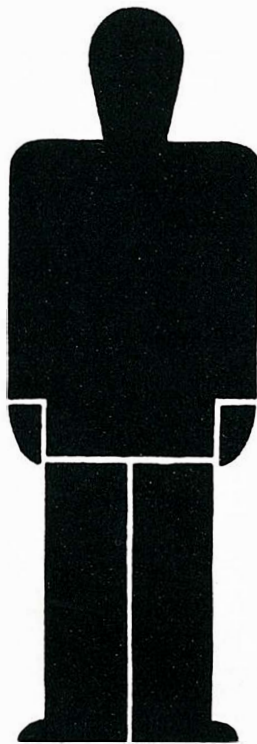
He strongly resisted the idea which prevailed at the time, and probably still prevails, that it is the written word that really matters and that pictures need not be taken very seriously. Throughout his life he was concerned with lucidity of expression in verbal language because he believed it was essential for effective communication; but he applied himself with equal dedication to the idea of lucidity of expression in visual language. He had come to grips with Basic English in order to write two small books for C K Ogden (*International picture language*, 1936 *Basic by Isotype*, 1937), and found much the same need for clarity of thinking when using picture language as when writing in Basic English: '... the picture language is an education in clear thought,' he wrote, '—by reason of its limits.' (3) For Otto Neurath, picture language had a further advantage in that it was less emotive than verbal language because the images used had not acquired the overtones words had acquired.

The use of the acronym Isotype (International System Of Typo-

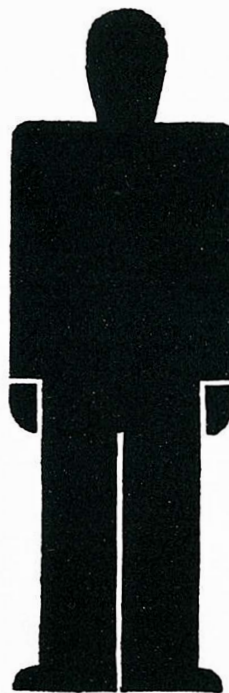
Mann



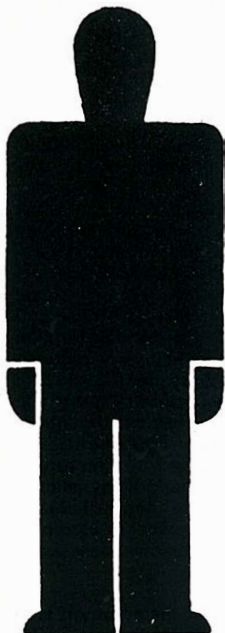
662



495



661



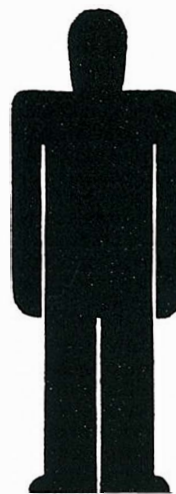
557



995



600



838

graphic Picture Education) gives special emphasis to the international nature of picture language. This is, of course, an important aspect of picture language, and Otto Neurath's statement that 'pictures make a connection, words make division' was primarily meant to underline the importance of picture language in an international context. The value of picture language has since been demonstrated in certain specialised fields internationally, such as road signs and the symbols associated with international travel; it is also true to say that some of the difficulties involved in the use of any kind of international language are now better understood than they were forty years ago.

The usefulness of picture language from the point of view of international communication should not obscure its other, perhaps rather more important, attributes in terms of 'making connections.' Otto Neurath believed that picture language was effective across a wide range of ages and abilities and that a good pictorial chart could speak as clearly (though probably at different levels) to a young child as to an intelligent adult. As a member of the Vienna Circle and, later, founder of the Unity of Science Movement he also saw picture language as helping to satisfy the need for a common approach to knowledge which bridged the various specialist branches of learning. Moreover, he saw that the structure of picture language gives it some advantages over verbal language —which has to be linear when spoken and is nearly always presented in a linear way when written. In picture language information can be presented in a linear fashion if need be, but it can also be presented in many different ways so that the user can make comparisons and see relationships between things more easily. Isotype, Otto Neurath claimed, '... makes use of the connection of parts not in one direction only, but in two, and the effect is a *language picture*.' (4)

In many ways the opportunity picture language offers for the making of comparisons was central to Otto Neurath's interest in it. On the simplest level, the visual presentation of two lines of quantities allows someone to see for himself that one item is bigger than another. On a higher level, whole patterns of growth can be compared one with another by reading visual 'profiles.' On the most complex level of all, as in *Gesellschaft und Wirtschaft* (1930), complete charts can be designed in series so that they can be compared in a number of different ways. What is more, picture language facilitates the economic, geographic, historical, and social correlations favoured by those concerned with the unification of science.

A set of symbols representing unemployed men and women. Somewhat dated certainly, yet somehow the set of the shoulders and the hands thrust deep into pockets remains a brilliantly appropriate piece of imagery



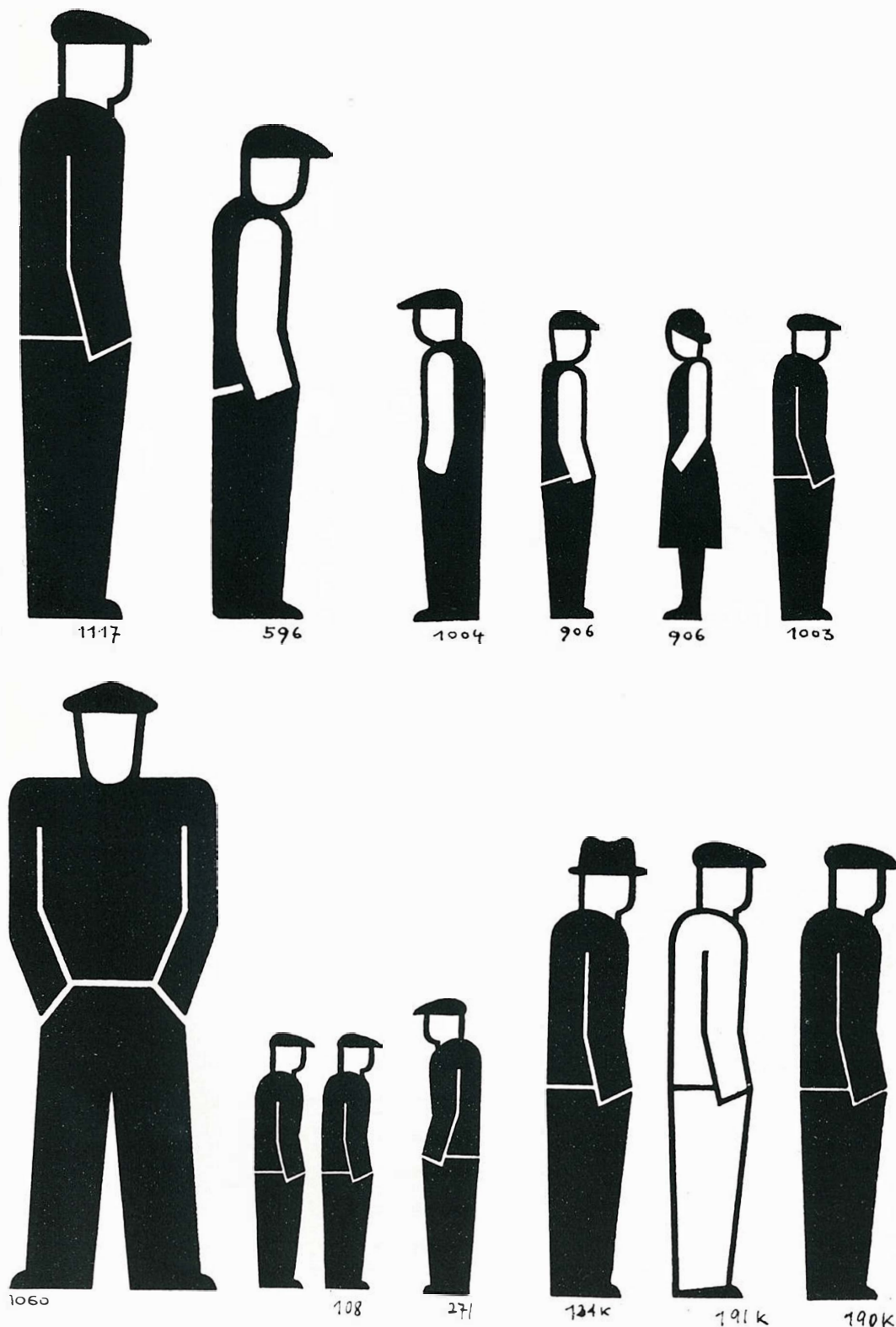
icographic 10, 1976

Arbeitsloser

The evolution of syntax

Pictures had been used for the purpose of conveying information long before the development of Isotype. Picture language preceded the evolution of writing and a number of societies developed their own set of rules in order to aid communication through pictures. Since the evolution of alphabetic writing in the western world pictures have, generally speaking, played a subordinate role to writing as far as communicating information is concerned. It is true that until the middle of the nineteenth century paintings usually told a story of some kind and relied on conventions of symbolism, composition, gesture and facial expression to convey their meaning; but there were few attempts to build up comprehensive picture languages before the present century. Comenius was not concerned with the structure of pictorial language, and even William Playfair, who developed a visual approach to the representation of quantities in the late eighteenth century which he called 'lineal arithmetic,' does not appear to have adopted any firm conventions of treatment. Similarly, the numerous nineteenth—and early twentieth—century designers who presented statistics and other information through pictures appear not to have considered the need to work out overall approaches. By the end of the nineteenth century many novel approaches had been adopted in the field of picture language but, in general, it was as chaotic as written language was in pre-classical times when early Greek and Latin characters assumed a variety of orientations and the direction of reading and writing were not fixed.

The real significance of Otto Neurath's contribution in the field of picture language is that he saw the need to establish a set of conventions in order to make communication easier and more effective. These conventions were developed over a number of years and were only settled upon after being tested thoroughly through use. However, two basic rules were formulated almost from the beginning of the Isotype Movement. The first of these related to the presentation of statistics by means of pictures and held that a sign should be used to represent a certain amount of things and a greater number of such signs a greater number of things. The second was general rule that perspective should not be used. Perspective involves making objects of the same size smaller or larger according to their distance from the viewer, which means that they cannot easily be quantified; when something needed to be shown in three dimensions the Isotype team used models or isometric drawings.

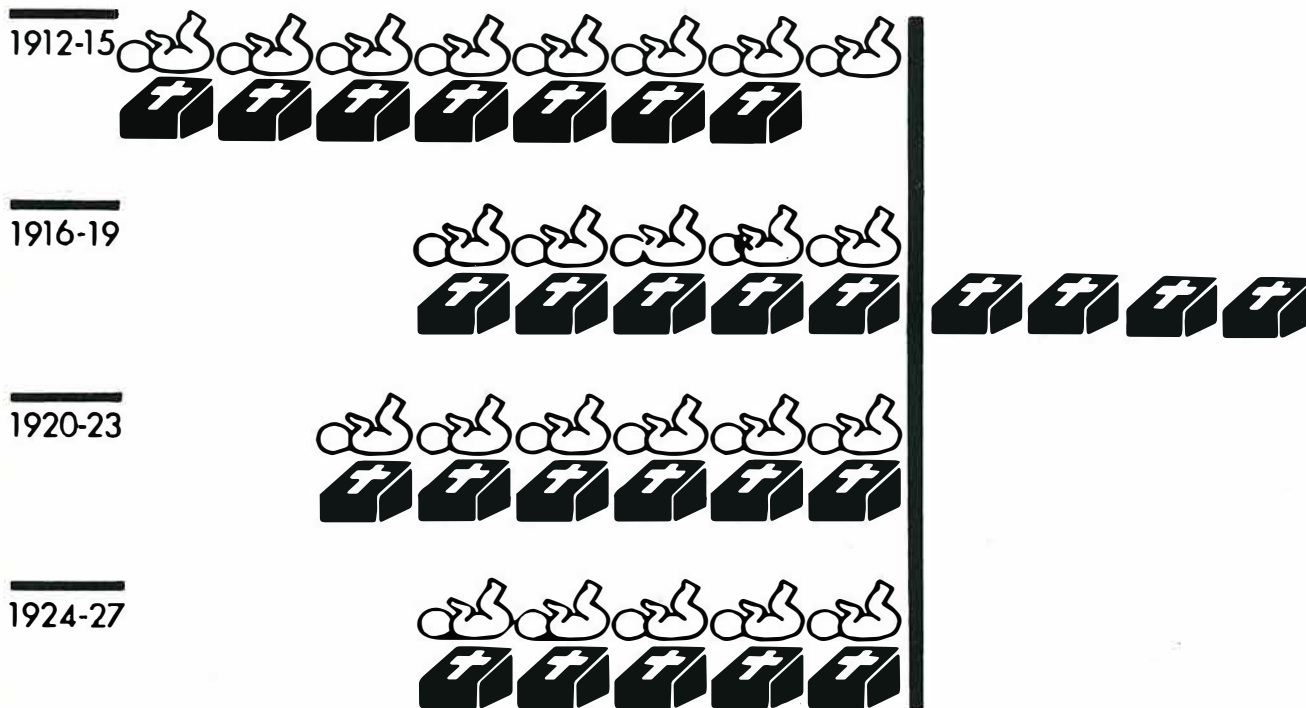


Twyman: *The significance of Isotype*

Top, a chart designed by the Isotype team in Vienna in the 1920s. It compares births and deaths in Vienna during a twelve year period

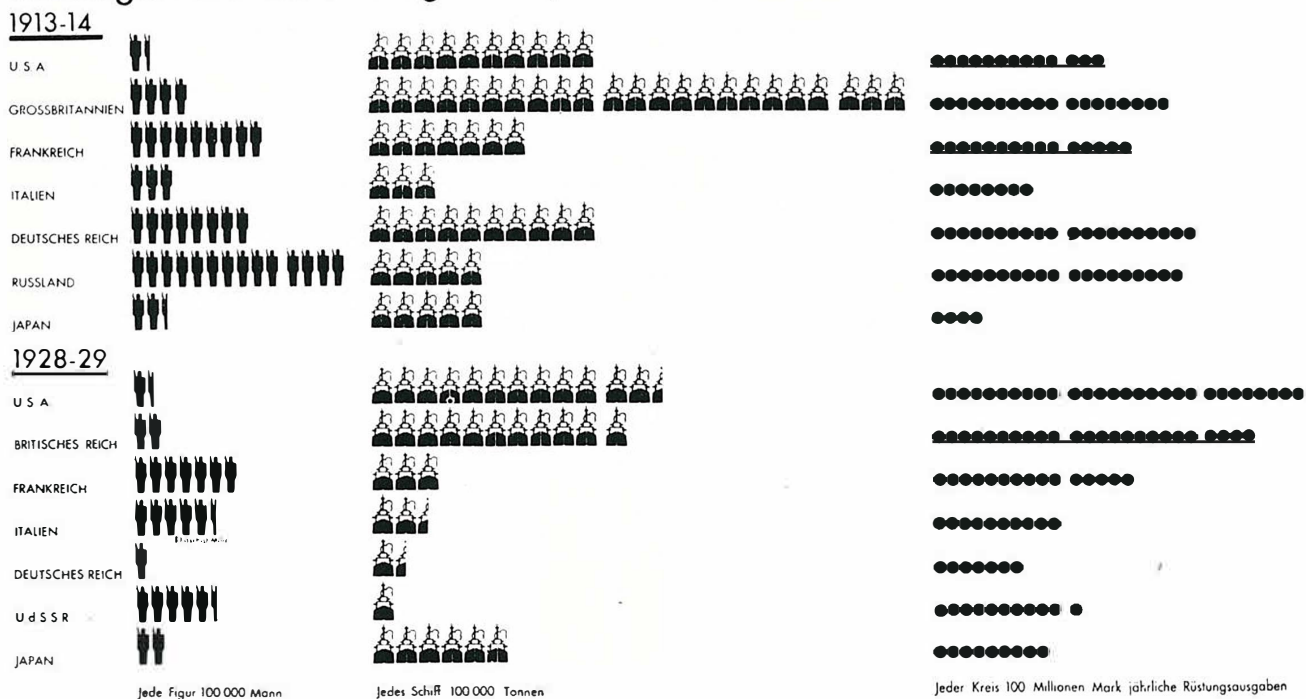
Below, a chart from Gesellschaft und Wirtschaft (Leipzig, 1930)

GEBURTEN UND STERBEFÄLLE IN WIEN



Jedes Kind = 20.000 Lebendgeburten Jeder Sarg = 20.000 Sterbefälle

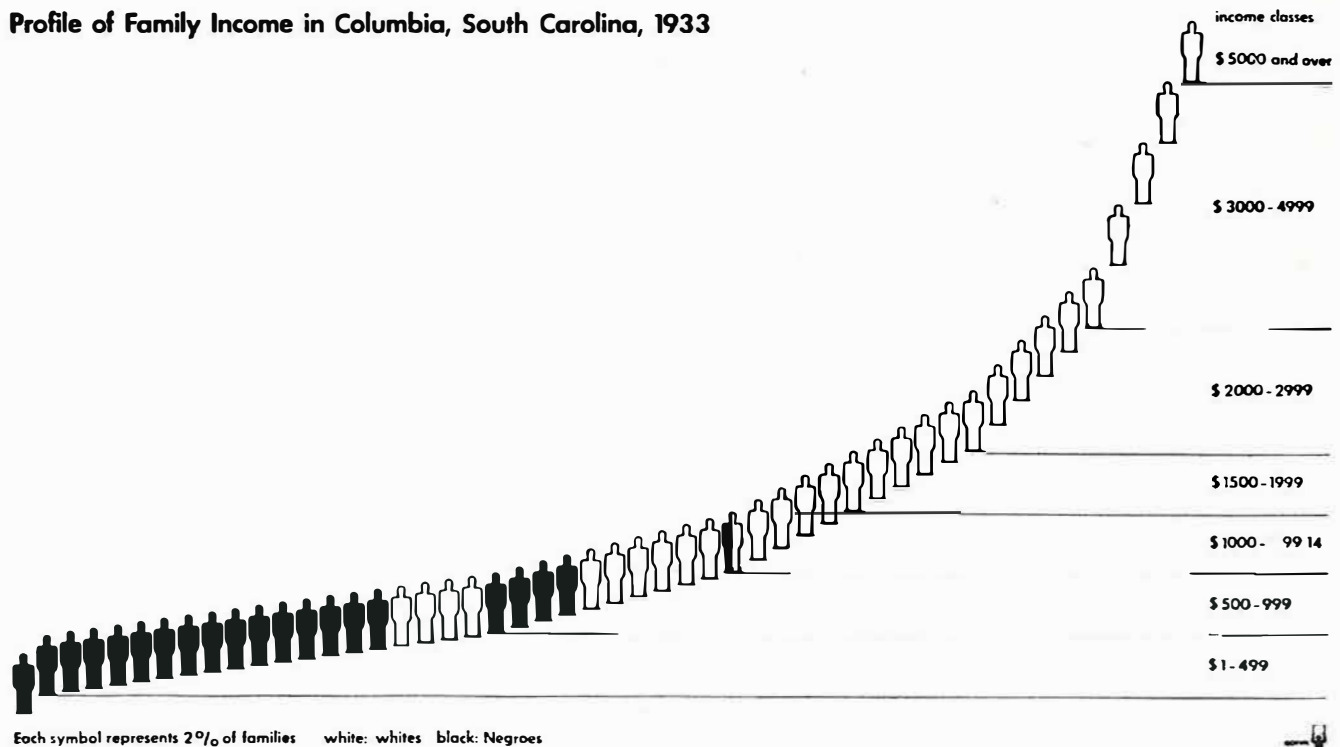
Rüstungen vor dem Kriege und jetzt



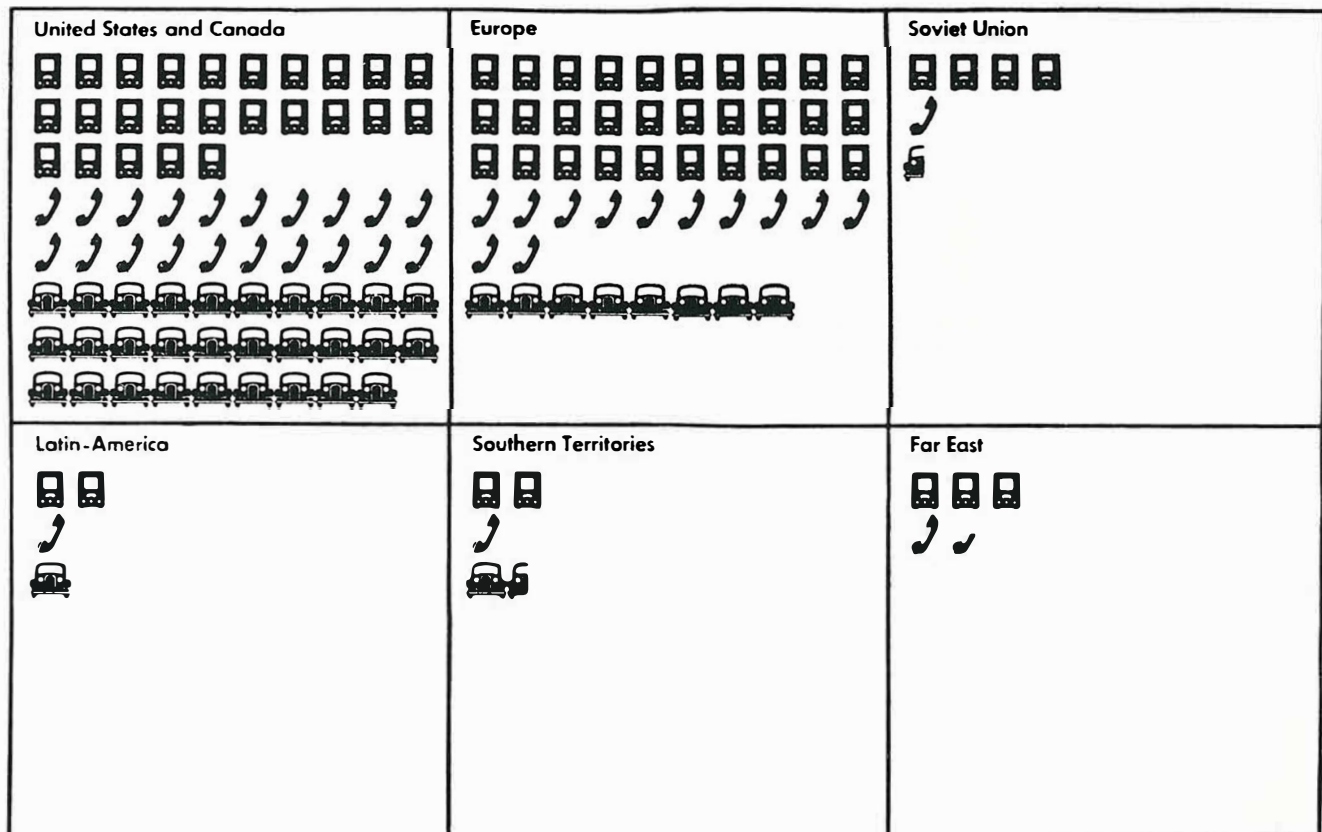
Anfertigung für das Bibliographische Institut AG, Leipzig
Gesellschafts- und Wirtschaftsmuseum in Wien

Below, two charts from Otto Neurath's book *Modern man in the making* (London and New York, 1939)

Profile of Family Income in Columbia, South Carolina, 1933



Radio, Telephone, Automobiles



Each symbol represents 1 million radios, telephones, automobiles



In accepting these two basic rules Otto Neurath was returning to the conventions of some of the earliest formalised systems of communication, and particularly to Egyptian wall painting and hieroglyphs which had influenced him profoundly. Thereafter a number of other rules and conventions were established by Otto Neurath and his team. They are described in detail by Otto Neurath in his book *International Picture Language*.

Some people may feel that conventions of the kind adopted by the Isotype Movement limit the freedom of expression unnecessarily; but consistency in approach is as desirable in picture language as it is in any communication system. Consistency helps the user to understand the meaning of a message because it allows him to get used to the way in which information is structured; it speeds up the assimilation of information; it enables comparisons to be made between work produced in different places and at different times; and it leads to an overall approach to the structuring of information which makes it possible to deduce meaning

through context and treatment in much the same way that meaning is frequently deduced in verbal language. From the producer's point of view, consistency of treatment is also welcome because it simplifies the process of making marks and cuts out unnecessarily repetitious decision-making; moreover, it allows people to work more effectively in teams, which is essential if any large-scale enterprise is to be undertaken.

Some of the conventions adopted by Otto Neurath were modified over the years in the light of experience, and he made it clear that they were not necessarily good for all time. The overriding consideration was to design something that worked, and Marie Neurath found it necessary to modify some of the conventions which had been developed for use in Europe when she came to design material for use in the Western Region of Nigeria. This is not an indication of the weakness of the Isotype system; on the contrary, it emphasises that, like all effective languages, it has a basic structure which is strong enough to withstand modification.

Organisation of the team

In its heyday in Vienna in the late 1920s and early 1930s the Isotype team consisted of some twenty-five people, which is large for graphic design team even by present-day standards. Otto Neurath was the inspirer, publicist, and key thinker of the Movement, but he remained closely involved with all the work being undertaken and was ready to be consulted on any matter, however trivial it may have seemed. The other members of the Isotype team in this period can be considered as falling into four main groups. First, there were the economists, historians, and statisticians who collected all the data; second, the "transformers" who were responsible for organising this information in visual terms so that it could be easily understood; third, the graphic artists who drew the symbols and other artwork and made final decisions relating to the placing of elements on a chart; fourth, the technical assistants who did such things as paste down symbols, spray flat areas of colour, print, take photographs, make models, colour lantern slides.

Otto Neurath was successful in establishing an organisational approach to design which is interesting for two main reasons. In the first place, the actual structure of the team clarified the stages in the process of designing and introduced precise points when work could be evaluated and, if necessary, modified. Secondly, the formulation of graphic rules and conventions which could be taught enabled his team to work as a whole and led to a consistency of treatment even though changes were made in the composition and size of the team. In establishing such a clear procedure and sets of rules in design work the Isotype Movement was doing what most design teams accept as essential when undertaking large-scale design commissions.

The Transformer played a central part in the Isotype team and this was one of the outstanding

innovations of the Movement. The Transformer occupied a position in the design process between the scholars who collected the data and the graphic artists who were responsible for the actual marks made on paper. He or she was a kind of

of visual editor. The task of the Transformer was to organise the information so that it was presented as effectively as possible and was in accord with Isotype conventions. In the case of series of charts, it also involved organising the information in such a way that comparisons could be made between charts. Otto Neurath has described the Transformer very aptly, and with characteristic social awareness, as the 'trustee of the public.' The Transformer needed to be able to make judgements about the information itself and to have the visual ability (though not necessarily the manual skills) to find appropriate visual forms for it. At the outset Otto Neurath provided the data, made the transformations himself, and then handed them over to free-lance artists; but as he built up his team these roles were taken over by a number of different people. Marie Neurath and Friedrich Bauermeister were the two Transformers in the Isotype team in the 1920s. Marie Neurath, who was trained as a physicist and mathematician, and then spent a term at art school, was the team's longest working and most experienced Transformer. She made all the transformations for *Gesellschaft und Wirtschaft* (1930) and for many other important publications. She worked closely with Otto Neurath for twenty years and after his death in 1945 carried on with the work in hand. In later years, when the team was very much smaller, she worked as he had done at the outset of the Movement, undertaking both the gathering of the information and the transforming.

The design of Isotype charts

When looking at Isotype charts today one is struck first, I think, by their modernity of appearance; and this impression is reinforced when charts designed for other publications, such as those in *Compton's pictured encyclopedia*, are seen in the context of typical graphic design of the period. Why is this so? The answer lies, I believe, in the fact that the Movement was never really interested in style for its own sake, but was always mainly concerned with imparting information as simply and directly as possible. In settling on a pictorial approach to communication in the first place Otto Neurath believed he had found a language which had something of the unemotive quality of numbers, but which was fascinating enough to interest the layman. He was concerned that nothing should be included in a chart that was not essential to its meaning because he felt the inclusion of anything else might distract from the message and destroy its overall neutrality. The organisation of the various parts of a chart and their relationship to

one another were determined entirely by the nature of the data and the people for whom it was intended. Otto Neurath's approach to graphic communication was therefore non-decorative, and it stemmed from the functionalist views on design of the period. All the same, the very best work of the Isotype Movement has a visual quality which justifies the use of the phrase 'the beauty of necessity'—an expression arising from the description by George Sturt of the attributes of a well-designed waggon.

Some visual features of Isotype charts stem from the clarity of thinking that underlies all Isotype work. For instance, the practice of ranging two sets of groups of items which have to be compared with one another along a central (vertical) axis, arises from the nature of the data. I know of no precedent for this Isotype practice, though it is one which is now widely adopted in typography. It is clear that this and other Isotype innovations were made only after considering a number of possibilities and trying them out. Members of the Isotype team had little or no formal training in the traditional methods of graphic communication, which meant that they were in a good position to think things out for themselves; and this is precisely what they did. In this respect the Isotype Movement deserves to be considered as one of the pioneers of modern graphic design. In my view it occupies much the same position in relation to pictorial communication this century as the pioneers of the New Typography do to verbal communication.

Otto Neurath was, of course, well aware of what was happening generally in the field of design in other parts of Europe. He travelled widely in connection with his work, visited exhibitions, and read voraciously (at one stage he estimated that he read on average two books a day). He was in fairly regular contact with the staff of the Bauhaus at Dessau through his own work and through the lectures he gave there as a visitor. He knew El Lissitzky personally, and Jan Tschichold, one of the father figures of the New Typography, worked with the team for a very short period while *Gesellschaft und Wirtschaft* (1930) was in preparation. He was also very quick in adopting Paul Renner's newly designed typeface, *Futura*, for all Isotype charts. The views on design of members of the Bauhaus were certainly well known to Otto Neurath because he poked fun at some of their approaches to architecture; it is hard to believe therefore that a man of his intense curiosity and love of discussion did not pick up something of the ideas of those associated with the New Typography. Though the

precise dates of Tschichold's involvement with the Isotype Movement are not known, he was working with the team (in a fairly peripheral capacity) shortly after his seminal book *Die Neue Typographie* (Berlin, 1928) was published.

The key period for the development of the characteristic Isotype approach to the design of charts was the late 1920s when the team was concentrating attention on its most ambitious publication *Gesellschaft und Wirtschaft* (Leipzig, 1930). The importance of the contributions of Marie Neurath, who was responsible for the transformations of all charts for this publication, and of Gerd Arntz, who joined the team on a full-time basis in 1928, should be mentioned here. Much of the quality of the work of the Isotype Movement from a visual point of view was due to them, and Otto Neurath's debt to them is explicitly and generously acknowledged in his book *Modern man in the making* (New York and London, 1939).

The visual quality of Isotype work is difficult to describe, and can probably be fully understood only by those who have tried to produce similar things themselves. It is seen most obviously in the way in which the elements of a chart are spaced so that the viewer is helped to 'read' the information in the way or ways that were intended. It is also seen in the drawings of the symbols, which show the importance of selecting essential characteristics and suppressing inessential ones, and in the choice of colours and tones. Like work of quality in any field, however, Isotype charts have a beguiling simplicity which conceals the time and effort which went into their production.

The design of the symbols which appeared on Isotype charts from the late 1920s onwards was the joint work of Otto Neurath and Gerd Arntz. Otto Neurath had seen some of Arntz's woodcuts in an exhibition in Duesseldorf in 1926. These prints included a variety of highly simplified drawn more or less in silhouette, and Otto Neurath realised at once that Arntz was the person he wanted to produce the symbols for his charts. Previously the symbols had been drawn by hand or cut out of paper, but after Arntz was involved with the Isotype Movement they were produced from lino-cuts. For a few years Arntz's contribution to the team was limited to the sending of work to Vienna, but in 1928 he joined the team on a full-time basis and had special responsibility for the design of the symbols.

Great care was taken to make sure that the symbols could be easily identified, were distinguishable from one another, and that they

could be placed happily side by side in rows. Emphasis was given to those characteristics which revealed the nature of the object, animal, or person being represented, while still keeping in mind the need for simplicity and dignity in the silhouette of the symbol. In addition, outline versions were needed and some symbols had to carry other symbols to qualify their meaning. The fact that Isotype symbols are so simple, even inevitable looking, reflects great credit on their designers. The outsider viewing Isotype symbols today is usually quick to remark on the changes in the forms of cars, aeroplanes, and dress since the 1920s, and it is true, of course, that symbols for some things tend to date quickly—and much more quickly than words. Otto Neurath was well aware of this and wrote '... the Isotype signs are dependent on their times like all these old sign-languages. Later times will see what their special qualities are and what the conditions were which made them.' (5) On the other hand, the briefest survey of a selection of symbols in use today for 'man' and 'woman' shows how trivial and lacking in authority symbols can be when the main consideration is to look modern, and emphasises how intelligently Isotype symbols were designed.

Influence

In one sense the influence of the Isotype Movement has been wide and can be seen today by anyone who travels, reads newspapers and magazines, looks at television, or is familiar with the kind of work done by children in schools. Some of the methods of graphic communication developed by the Isotype Movement are now accepted as part of the currency of graphic language, though they are rarely used as sensitively or intelligently as they were by Otto Neurath and his team. There are also a number of bodies still active today which stem directly from the Isotype Movement. But for all the general influence it has undoubtedly had, the pioneer work done by Otto Neurath and his team in Vienna in the 1920s has for the most part been forgotten.

Those who have heard of the Isotype Movement usually know of its work in the field of international symbols. But though the International Organization for Standardization has been concerned in recent years with rationalising symbols for international use, in general, the essential message of the Movement that there should be standard ways of representing things has been ignored. What can be more irresponsible in this context than the re-design every four years of a new set of symbols for the Olympic

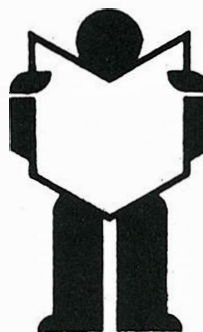
Games? Some designers cannot resist inventing new symbols; and in recent Olympic Games the need for a clearly understood graphic language which is retained and reinforced through learning from one Games to the next has been ignored.

The lasting influence of the Isotype Movement is probably seen most clearly in the field of graphic statistics. During and immediately after the Second World War statistics were quite frequently presented in the form of Isotype charts; and in more recent years new approaches to teaching and learning and an increase in the use of visual media generally, have been responsible for a revival of interest in graphic statistics.

The development of an international means of communication based on the use of standard symbols, and the presentation of statistics by the repetition of units which stand for particular quantities, form only a relatively small part of the Isotype contribution to graphic communication. The major undertakings of the Isotype Movement, *Gesellschaft und Wirtschaft* (1930), the exhibition 'Rondom Rembrandt' (1938), Otto Neurath's book *Modern man in the making* (1939), and the series of schoolbooks *Visual history of mankind* (1947-8) all extend the range of graphic language in different ways. *Gesellschaft und Wirtschaft* showed, among other things, the possibility of producing a coordinated series of charts which can be compared one with another in a number of different ways. 'Rondom Rembrandt' demonstrated the value of using graphic approaches in an historical field which, at first sight, might have seemed unsuited to them. *Modern man in the making* was conceived in terms of thorough integration of text and charts; and *Visual history of mankind* revealed the value of intelligently selected and accurately drawn images as a basis for discussion and learning in schools. The real lessons of the Isotype Movement are probably to be learned only after a careful study of such major undertakings which show the importance of the team's general approach to design. This is the most significant contribution of the Movement and, in my view, is likely to prove the most influential in the long run.

The output of the Isotype Movement as a whole draws attention to two things which are of special interest to many designers today. First, it demonstrates that successful designing depends to a large degree on clarity of thinking; secondly, it provides support for the view that the graphic designer's primary role is to serve the needs of society. These points were made more

succinctly by Lancelot Hogben in a review of Otto Neurath's *Modern man in the making* when he described it as combining 'all that is best in Descartes and the *Daily Mirror*.'

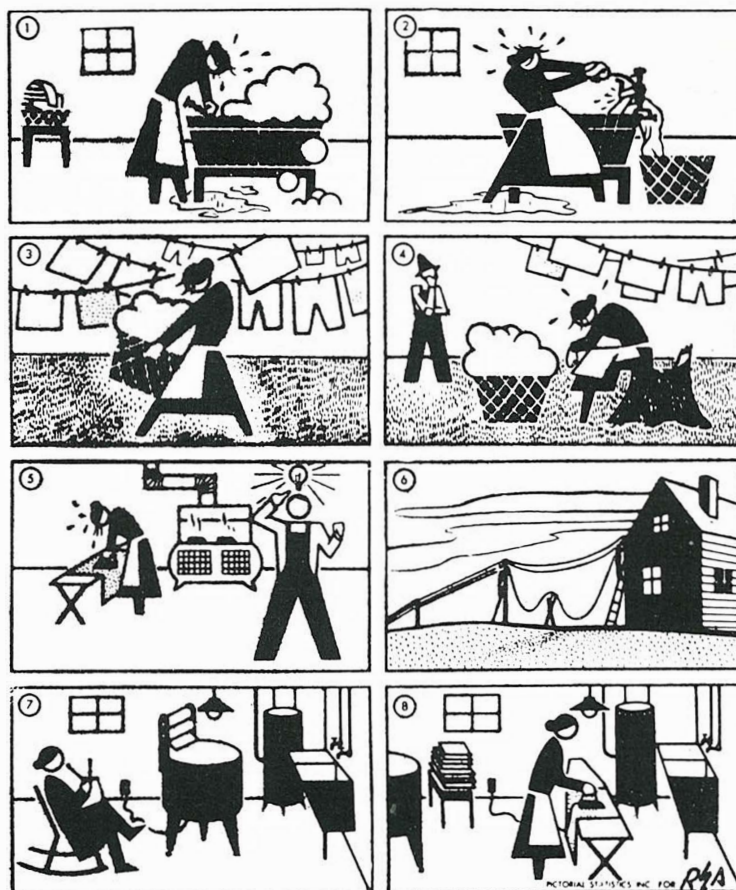


Left, the trademark of Pictorial Statistics, Inc, which was designed by Walter Huxley in 1936

Below, a cartoon-type story which was designed to promote the electrification of farms. It was prepared by Pictorial Statistics, Inc, for the United States Rural Electrification Administration in 1935 and was designed by Karl Koehler

References

- 1 'Museums of the Future,' *Survey Graphic*, vol 22, No 9, 1933
- 2 translated and reprinted in Otto Neurath, *Empiricism and Sociology*, edited by M Neurath and R S Cohen (Dordrecht and Boston, 1973) p257
- 3 *International Picture Language* (London, 1936) p22
- 4 Ibid, p62
- 5 Ibid, p106



symbols by courtesy of Glyphs, Inc, Kent, Ct. 06757 USA

Below, a series of symbols intended to depict various occupations, types of crime and types of suicide. These were designed by Karl Koehler for Pictorial Statistics Inc, in 1930



An American branch of Isotype

As a supplement to Michael Twyman's article, we publish here some of the symbols designed in The United States by Pictorial Statistics in the 1930s.

These come to us by courtesy of Rudolf Modley, who worked with Otto Neurath from 1923 to 1930 in Vienna, and directed the work in the United States from 1934 to 1945.

As Rudolf Modley points out, it did not take long for Neurath's work to become known in the United States. In March, 1932, the "Survey Graphic" of New York published an article on the Vienna Method.

This was followed in January 1933 by an article by Waldemar Kaempffert in the "New York Times Magazine" which attracted wide public attention.

In 1934, Pictorial Statistics, Inc, (later called Pictograph Corporation) was established in New York. In 1937, Harper's published "How to use Pictorial Statistics" and Random House (and Modern Age Books) published "The United States: A Graphic History," which was selected as one of the fifty best designed books.

While Neurath spoke of "an international picture language," he was aware that the uses of a picture language are much more limited than those of normal languages.

In one of the manuscripts on which Neurath was working at the time of his death in 1945 he had this to say: "The tendency . . . is not to intrude into the verbal field by building up a sort of international writing. . . the tendency is, on the contrary, to remain self-explanatory as long as possible, to create narrative pictures composed of self-explanatory symbols, aided by words, and as an aid to words."

Rudolf Modley has long been one of those pioneers who has sought to continue Neurath's vision. In 1966 Glyphs Inc, was founded with Margaret Mead and himself as co-chairmen and with a distinguished board of directors.

Since that time their organization has directed its efforts exclusively towards aiding in the establishment of universally usable graphic symbols.

Editor

Above, Symbols designed to show equipment of homes with electric light, flush toilet, central heating, stoves (gas or electric), vacuum cleaners, tub and shower, and refrigerator.

They were designed by Henry Adams for Pictorial Statistics Inc, in 1930

Traveller's symbols

Thomas R Hofmann

There is a method for the painless introduction and use of international symbols for the traveller—the symbols that necessarily are becoming more and more prevalent to indicate toilets, directions and other information important to the traveller. These symbols must be international if they are to serve the end for which they are intended (although there is no need for there to be only one symbol for any particular meaning), and hence cannot be in any one language or other, unless it eventually happens that we attain the goal of a single language which everyone understands. (1) Kanjis (the characters used in writing Chinese and Japanese) are a natural candidate for this need, and should be considered as such, since they are already understood by one quarter of the world's population, including entire populations speaking three completely different languages), but most of them are too complex to be easily distinguished by those who do not know the system.

The traveller's symbols already in use (including traffic signs at airport and railway stations) are generally not accompanied by any linguistic expression of their meaning. Sometimes this is because of lack of space, but often there appears to be no reason why their meaning is not written in at least some language.

This, I would argue, is a gross mistake. It means that when first confronted by a symbol, the traveller is unaware of what it is supposed to mean, unless its meaning is self-evident. But as Rudolf Modley has repeatedly argued, (2) no symbol has a self-evident meaning, at least until one has learned the basic syntax and semantics of the system of symbols (like the use of a red X or / for not or forbidden).

While it is hardly surprising that one might not understand all the symbols in a foreign land, it is not a little annoying when one cannot understand some symbols in one's own country. That annoyance can possibly turn into antagonism towards the use of traveller's symbols altogether, although I am not aware of any occurrence of this, as yet.

But more important, a symbol is used in order to communicate something. A symbol whose meaning is not clear to somebody is not doing the job it is there for, and should be replaced, modified, or perhaps, simply supplemented by an explanation in natural language.

Indeed, to supplement a symbol in this way with natural language will prevent non-understanding and misunderstanding of a symbol, especially in one's own country. While it is true that the natives of the region will probably read the linguistic expression in preference to

perceiving the symbol, they will become aware, more or less unconsciously, of the shape of the symbol, and of its meaning by its association with the linguistic sign. If the symbol is more prominently displayed than its linguistic equivalent, this unconsciously learned knowledge will begin to be used after a while, and if the person goes to a place where a different language is used, he will discover that he depends entirely on the symbol, on the knowledge that he may or may not be aware of. In this way, a person learns a symbol from its use, and there is probably no upper limit on how many symbols a person can learn in this way. The symbols used as trade marks are learned in this painless way, and one may guess that upwards of several hundred trade symbols are recognized by most adults in Western countries at least.

I would suggest that symbols should never (except in special circumstances) be used alone. Rather, they should occur with their meaning in the local language. Then there will be no overt learning needed to learn them. People who are curious will stop when they see a new symbol and find out what it means, and with a few repetitions of that curiosity, the symbol will be learned. Even people who do not want to learn the symbol will read the language equivalent as if the symbol were not there. But after twenty times, they will know what the explanation says before they read it. And when either sort of person goes into a different language area, the symbols will take on a more important function as he will not be able to read the language equivalent any more. In this way, it is unlikely that anyone will have any difficulty in learning the symbols that affect him.

Many signs are placed where there is no excuse for not supplementing the symbol with its linguistic expression. Consider the signs for men's and women's toilets. These are seldom if ever used where one could not add the word *men* or *women*, or the equivalent in the local language. The same applies for "push" and "pull" signs on doors, or "no entry" signs. I have even observed entrances to toilets, labelled in twelve or so languages (in Vancouver), but there is a difficulty with so many languages (or even two languages, in my experience) as the reader must search first for a language with which he is familiar.

Other signs are difficult to supplement with a linguistic expression of equal visibility. Most traffic signs are of this sort. Nevertheless, there is usually no reason why any such symbol could not be supplemented with an explanation in small print,

so that when there is doubt as to its meaning, one can stop and look closely at the sign to find out what it means. For example, the circle with a diagonal bar or a cross, being introduced in Europe as symbols for "no parking!" and "no stopping!" are still unknown to many drivers there. One guesses at what they mean and continues. If one guesses wrong, one generally finds out sooner or later by suffering for it.

The only place where a symbol must appear without an explanation for each occurrence is in a table of information (railway timetables or hotel and accommodation schedules, for example). But even in these tables, it is advisable to explain in abbreviated form the meaning of the symbols at the bottom of the page.

Thus, in sum, nearly every occurrence of a traveller's symbol can, and should be supplemented by a natural language expression explaining the meaning of the symbol. If it is not easily legible in words, at least in small lettering that a person may read close up to find out the meaning of any symbol he does not understand. In general, the language native to the region should be used so that people not familiar with the symbols, and those who may be antagonistic towards them, can read the signs in their own country, and to allow most people to learn painlessly and unconsciously the meanings of the symbols that affect them. The language used may possibly be supplemented with one of the major international languages (eg English, French, Russian, or in Kanji) for the sake of the novice traveller. But it is much less imperative, and more than two languages (with similar letters) should be avoided. In essence, however, no traveller's symbol should stand mute, without explanation, however difficult it is to read that explanation.

Notes

(1) But in most cases (especially with iconic or map-like symbols), understanding is faster from symbol to meaning than through some language from symbol to sound to meaning. Where time is critical (as in driving a car or choosing a route without blocking up the flow of people in a terminal), the international symbol will still be justified, even if we do not have a universal language.

(2) in various issues of *Glyphs—newsletter*, and in 'Prospects and problems for universally usable graphic symbols (Glyphs)' 1969. *International Journal of Symbolology*, or in 'World language without words' (1975) *icographic 9*, pp 16-19

(Author's note: This article should be the text of a presentation delivered at the *Icograda* Edugraphic Conference held in July 1975 at Edmonton, Alberta, Canada. This presentation was essentially a slide show including some 640 slides. The verbal portion of the show consisted primarily of impromptu comments about the slides except for a short prepared text at the beginning. Since it is impossible to print that presentation what will follow here is a 'word show' instead.

I have included as a part of the presentation the essence of a design and educational philosophy that currently exists at the Institute of Design as IIT. This philosophy is unfortunately not widespread although it has been emerging slowly and laboriously and, at the time of this writing struggles for survival.)

Design education is not a newcomer to civilization. As long as man has had the need to make things, utilitarian or otherwise, he has also needed to teach the making of such things. At first man's needs were simple and so the extent of the learned knowledge man passed on was also simple. Slightly more sophisticated was the master-apprentice system which was in use (and still is for some trades) for the last few thousand years.

Eventually because of an increased need for efficiency, the master-apprentice system became formalized into what are called academies. Support for these academies came mainly from the ruling classes and the wealthy. These were groups which benefited most from the products of the academies.

Arnold Toynbee sets 1760 as the start of the modern industrial revolution. By the close of the 19th century this revolution had bloomed. The academies had also grown and flourished during this period but not necessarily in a partnership with industry.

In 1919 in Germany two schools, the Grand Ducal Academy of Art and the School of Art and Craft merged to become the now famous Bauhaus. Walter Gropius was the first, as well as the most important director of the Bauhaus. He put together a faculty of the most advanced artists and designers in Europe. Among them were Finckler, Itten, Schlemmer, Mueche, Klee, Kandinsky and Schawinsky. And later, the second generation of faculty included Bayer, Breuer, Albers, and Moholy-Nagy.

The Bauhaus proceeded to become a world famous school of design. This was not, however, for the reasons most people assume. Jay Doblin, in a lecture *Bauhaus—Past, Present, Future*, said,

The author teaches at the Institute of Design, Illinois Institute of Technology. Educated at the Art Institute of Chicago and the Institute of Design, IIT, he has had experience both as a freelance and staff designer in packaging, corporate identity, signage and exhibition design



icographic 10, 1976
Author's address:
4714 Lee Street,
Downers Grove, Illinois
USA 60515

"The Bauhaus has been called the first school of design to be in touch with emerging technology; but I believe this to be a fallacy. The Bauhaus was unconcerned with technical developments, such as electrification, electronic communication, personal hygiene, refrigeration, telephones, motion pictures, the automobile, street furniture, mass transit, hospital equipment, industrialised building, airplanes, packaged food, etc. The Bauhaus was not interested in the function of technology but only its form; it produced geometric shaped arts and crafts . . . lamps, pottery, tea cups, rugs, chairs, jewelry, custom architecture, painting and sculpture, etc. The Bauhaus, in fact, exerted overwhelmingly negative influence on design by focussing interest on the pure form of products, not their utility."

I speculate that the interest the Bauhausians had with form may be rooted in class consciousness. More specifically the casting off of decorative detail in art, architecture, and artifacts, was the casting off of the symbols of the wealthy and aristocratic. Often justified as being efficient for mass production, streamlined designs were a means of rebelling against the status-laden details of heavy embellishment.

The modern designs of the Bauhaus also reflect another revolutionary aspect of the educational philosophy of that school. That is, a shift from subjective analysis to objective analysis. This is apparent in the extensive and conscious use of geometry for all types of designs. This approach was so widespread it became known as the Art Deco Style.

Objective analysis was the key to the major achievements of the Bauhaus. It formalised the collective knowledge of the faculty of the Bauhaus as concerns visual language by breaking it down into basic learning exercises. Perhaps for the first time in history the language of vision was taught in a rational way. This is one of the most important legacies of the Bauhaus. The other is the individual contributions of the great masters of the Bauhaus whose works we see in the sklines of cities, in museum collections, and in libraries around the world.

In 1937 a coalition of Chicago industrialists headed by Walter Paepke of Container Corporation encouraged, then financed Moholy-Nagy to come from England and start a new Bauhaus, later to be known as the Institute of Design. He was its director until his death in 1946. Moholy's basic aim was to develop students with more than just technical training. "The student was

encouraged to develop himself as a creative individual, stimulated to think and evaluate, to question the status quo, and to rebel against conventional solutions. Designers exert an influence on our lives that is not to be taken lightly. It is easily forgotten that it is they who give shape to our surroundings by designing buildings and bridges, fabrics and furniture, vehicles and signs. Only the designer who understands the social, biological and psychological implications of each problem will be able to produce completely satisfactory results." (1) This was the kind of school Moholy envisioned.

After Moholy-Nagy, the directorship of the Institute passed to Serge Chermayeff who continued this established direction for the next five years. Following Chermayeff, Crombie Taylor was acting director for several years, then he was replaced by Jay Doblin.

At the time Doblin assumed directorship of the Institute of Design he was well established in the business community as chief designer to Raymond Loewy. Disillusioned by commercial design production he felt "the need to develop a program to solve the problems that faced society. It would be carefully constructed program of information-based design that produced non-commercial products that worked." (2) His aim was to "produce designers who had the will, ability, and the ethical base to change American design for the better." (3)

The germ of this idea, information-based design, eventually took hold but it did so slowly. The biggest handicap to achieving this end is the popular notion that design is just a newfangled name for art, and that artists solve problems through a mysterious application of insight and intuition. Thus, the Institute of Design, like other design schools is handicapped by the influx of would-be artist-designers not psychologically prepared to deal with information-based design.

Another misconception is that designers are "doers" not "thinkers." In other words, one could not expect much intellectualism from designers, it is supposedly not consistent with their natures.

In the last decade two people have helped to reverse this stereotyped view of what a designer is, or at least could be. The first is Chad Taylor, who is no longer at the Institute. He contributed much to change the image of the designer as being a narrow specialist to one of a "thinking problem-solver" with extensive knowledge outside his immediate craft.

Taylor helped to reshape the curriculum which is in operation today. He believed that having the ability to manipulate visual elements, even expertly, was not enough. He felt that to do so without understanding the social, political and psychological implications was to fail to solve the problem adequately, a philosophy consistent with Moholy's. Another idea he fostered was the concept of worthiness of design; that is to say, what values should be taught. He took a clear stand for the major social and educational issues and against the pettier problems that the business world often gets bogged down with. This approach made sense in light of the fact that most schools were dedicated to producing students who could fill the vacant seats in art studios, catalogue houses, and design shops. Few schools, if any, were trying to fulfill the greater need of involving their students in social issues.

The other person who has influenced the direction of the school in recent years is Chuck Owen. Jay Doblin saw in Owen the link between design and the information sciences.

Chuck Owen brought to the program an information-science base to problem-solving. He is, in fact, an expert in computer programming and application. What makes Owen unique in this field is his interest in social issues and how computers can help designers in solving problems of this nature. Without the use of a methodology a designer is inherently limited in the size of the problem he can undertake. As the number of problem elements increases, so do the possible interactions. It does not take too large a problem before the interactions become too complicated to handle informally. Most problems dealing with quality of life issues are of a scale too large and complex for individual handling. Team work or group methods are also a must in these situations. Few schools of design are willing to commit themselves to the pursuit of such problem solving. They yield to the pressures of the business community to train product or graphic designers who are eager to fill the ranks in advertising agencies and styling shops.

A lot of controversy exists over the difference between art and design. Some educators maintain there is no difference, that art and design are one and the same. Others believe there is a difference and that it should be reflected in the curriculum of the school. Both philosophies are correct, I believe, although this may seem paradoxical. Art and design are the same if you regard them as products, things, artifacts, etc. The difference lies in the process of achieving the by-product. Both artists and designers share the visual

world as well as a common understanding of aesthetics. They may also share processes, vocabulary, media and methodology. This one factor that separates the two fields is criteria. That is, who establishes the criteria, self or society? A good 'art' curriculum helps the student to make more "self" decisions, a good design curriculum will enable the student to make societal decisions. By this definition designers are also artists inasmuch as they can and are qualified to make self as well as societal decisions in order to produce the things, products, artifacts to benefit each. Artists are solely qualified to make self decisions, as the societal component is unimportant in their education.

The question is, can both types of curriculum co-exist at one school? Yes, to the extent that law and medicine, for instance, are taught in the same university. However, it would be unrealistic for a student to simultaneously pursue degrees in both law and medicine and achieve proficiency in either field. The same unrealistic situation would exist for the student trying to study art and design simultaneously; that is to learn to make self and societal decisions proficiently at the same time.

Any institution with limited space and financial resources has to make a commitment to one direction or the other. Otherwise a bastard program will result. Such a curriculum will not succeed in producing either artists or designers. We can accurately say that 56 years and numerous other steps, starting with the merger of the Grand Ducal Academy and the School of Art and Craft to form the Bauhaus, have produced a thriving, legitimate offspring, the Institute of Design, Grandson of Bauhaus.

References

- 1 Moholy-Nagy, *Everyday Art Quarterly*, Walker Art Center, 1947
- 2 Jay Doblin, *Chicago Bauhaus—Past and Future*. A lecture at the Illinois Institute of Technology, May, 1974
- 3 Ibid

Towards a more consistent English spelling

J J Dames

A number of interesting articles have appeared recently in *icographic* concerning the question of spelling reform. In issue 9 two versions of simplified English spelling were offered for discussion.

Kingsley Read's version offers an extended alphabet of 42 letters. Such an alphabet would necessitate redesigning the typewriter keyboard, as well as casting a large number of new types (and throwing into disuse the existing ones) for printing presses.

Soundspel, an American approach to a 'phonetic alphabet' makes use of the available Roman alphabet, but its application of phonetics leaves much to desire.

Did these solutions start from the right premises?
A heap of cowdung on a narrow foot-path creates a number of problems, which need to be solved differently for the pedestrian, the cyclist, the farmer and the dungbeetle..
Whom shall we favour?

We are all agreed that the present-day English spelling could do with some simplification, but simplification for whom?
The Frenchman, Italian, Spaniard, Portuguese, German, Dutch, Scandinavian, would immediately understand the meaning of the printed word 'nation,' even if they did not know any English at all, but would the printed word 'neishn' make any sense to them?

The question is therefore: Are we going to redesign our spelling for the '200 million English-speaking people who are already in the driver's seat'—whose mastery of the intricacies of our archaic spelling is a hallmark of their erudition—and who can rightly be presumed to be indifferent, if not positively hostile, to tampering with the spelling they know? Or are we looking further ahead? Should not our first concern be the 2,000 million (and more) people, now inhabiting the world, as well as the countless millions of future generations, who will be in need of a world language such as English, to help them understand and solve the problems confronting all humanity?

Africa alone has 1500 languages, many of which are just emerging from their unwritten state to adopt a broad phonetic Roman alphabet. Each of these languages, perfectly tailored to the prehistoric needs of the indigenous, would have to coin countless words to express thoughts which previously never entered their heads. One illustration may suffice: Swahili is the *lingua franca* as well as the national language of a territory where well over one hundred indigenous mother-tongues

Professor Dames was born in Holland. He was formerly the Director of the Literacy Center in Kenya, and for fifty years has been involved in the problems of teaching English as a second language in Africa. He is the author of five primers and readers in the vernacular—Swahili, Kikuyu, Turkana, Luyia and Luganda. He has carried out research into the problems of transcribing the Somali language into the Roman alphabet.

are being spoken. The standard Swahili dictionary translates (one should say 'defines') "sausage" as 'the intestines of a wild animal stuffed with minced meat.' This of course is useful to know, next time you order your breakfast in the New Stanley Hotel, Nairobi. But would "sosij" not have been simpler?

No doubt Swahili serves a useful purpose, but it can hardly replace English as a world language for commerce, industry and science. Already English is one of the most important subjects in all primary schools in East Africa. What a boon would simplified English spelling be to those whose *lingua franca* or mother-tongue are already spelled phonetically in the Roman alphabet? With the world on the verge of the greatest disaster imaginable, overpopulation and pollution, how are we to get the active cooperation of the third world, if we cannot communicate with them by means of a common language?

English as world language is no longer the sole concern of those whose mother-tongue it happens to be. All world citizens, present and future, to whom English is, or is to be, the vehicle for expressing their thoughts on politics, economics, arts, psychology, technology, chemistry and other spheres of mental activity requiring the utmost accuracy in semantics, all these world citizens are vitally interested in the spelling of English.

The problems of simplifying spelling are inherent to all written languages, for the simple reason that all living languages constantly change their pronunciation as well as their vocabulary. Therefore, we may well learn from other languages, how to arrive at a simpler spelling, especially if these languages also use the Roman alphabet.

Where our problem is unique compared with other living languages, is in its vastness and its depth. Vastness, because it affects the whole world; depth, because no other major language has assimilated so many foreign words without changing them to conform to the present-day English pronunciation. However big our problems are, in essence they are the same as in other languages.

How do other major languages solve their spelling problems?

Without going to too much detail;

- 1 They use the Roman alphabet, with minor adjustments.
- 2 Within their own language, they use the same symbol for the same sound.
- 3 Compared with other languages, any language may give slightly different function to some letters

This shortened version of his article provides a timely reminder that the problems of English orthography should no longer be the sole concern of those who speak it as their mother tongue. Because of its primacy as a second world language, millions of people from all cultures are vitally interested in how its spelling might be reformed

to conform to certain conventions. 4 They do not exclude the use of digraphs, or even trigraphs to represent one single significantly different sound, and vice versa, they do not exclude the use of monographs to represent diphones or even triphones.

Within these guidelines, the writer, as well as the reader imposes certain restrictions on the designer of an easier alphabet. The writer's handicap is his instrument of production: the ball-pen, the typewriter and the printing press. Of these three, handwriting is the most pliable way of producing visual sound symbols. Next comes the printing press, which has access to a great variety of types and sizes. Last of all comes the typewriter, usually confined to about 90 symbols, some of which are pretty useless or inaccessible.

Since we are redesigning spelling and not typewriters, our scope is restricted to what a typewriter can produce. Whatever a typewriter can produce, a printing machine can do. The same may be said of handwriting, with the qualification that the handwritten outline of a letter may differ considerably from the printed or typewritten form and still be perceived as the handwritten equivalent.

A further consideration in designing a simpler spelling is the extent of the involvement of the writer. The task of the writer is more difficult than that of the reader. The reader will know what is meant, whether we spell 'houses' or 'hauzz,' but the writer will have to know and apply spelling rules before he can start writing. If our new spelling retains a number of the illogicalities of the old spelling (to please those in the driver's seat) the task of the writer of the new spelling will become very difficult indeed.

To take a few examples from the American *Soundspel*;

Without a thorough grounding in the old spelling, how could a writer of the new spelling know that 'houzez' is right and that 'flowerz' is also right. (Why not 'flouerz'?). Why use different letters for the same sound in 'oek' and 'cold' (Why not 'coeld'?). Why write 'to go' and not 'tu goe'? Why is 'lawn' correct according to *Soundspel*, but 'wawter' wrong (it is spelled 'wauter' in *Soundspel*). Why does *Soundspel* write 'sity' and at the same time 'civilized'? If 'born,' 'lawn,' 'smaul,' are correct, and if 'angcor' is the correct spelling for 'anchor,' will 'waucor' be correct for 'walker'? If some phonetic spellings are rejected because they are 'graphically unacceptable to the eye,'

icographic 10, 1976
Author's address:
Garden Secretarial College
America House
Muindi Mbingu Street
PO Box 48946
Nairobi, Kenya
Africa

How shall we tackle some Welsh names?

How phonetic should our spelling be? Except in textbooks on language studies, the aim of the writer is not to teach the correct pronunciation or spelling, but to communicate the meaning of a word or a sentence. To that purpose our spelling must be broadly 'phonetic.' Our spelling must be consistent, ie, the same symbols for the same sounds, so as to make the task of the writer easier.

We should not lose sight of the fact that spoken language is much more than a string of vowels and consonants. There is intonation (melody), stress (emphasis), duration (long or short sounds), periods and pauses, all contributing to the meaning of what is said. But even the most accurately phonetic writing is barely a skeleton or shadow of the spoken word. Phonetic spelling is no more than one of the many aids to make the meaning clear. In writing we separate words (something we do not do in speaking), and we use punctuation to help in making the meaning clear. Phonetic spelling, then, must be the servant of semantics.

Towards a new alphabet

Mohan S Kala

Everyone is agreed on the need for a new set of symbols that are both man and machine amenable. Mohan S Kala, who has been doing research in alphanumerics and metrology, claims that his Fondijyal system fulfils both requirements. Born in South Africa of Indian extraction, he is currently working for the Medical Research Council, London

This article originally appeared in The Times of India and we are grateful for their permission to republish it here

icographic 10, 1976

Below, key to the new alphanumeric characters. The first asterisk indicates a new vowel, ie, 'A' as in 'Arm.' The next two asterisks indicate the new numeric characters, ie, 'ten' and 'eleven' respectively, of the base twelve system of numeration

An efficient communication system, or language system, should provide adequately for present and future requirements. At present, there is a great need for a communication system that can be easily learnt and used effectively by all individuals. In addition, it must be borne in mind that in the very near future there will be an equally pressing need for a machine compatible communication system.

There are thousands of languages in the world and they all possess four basic principles in common, with varying degrees of sophistication. These principles constitute the alphabet, the numerals, the weights and measures, and the grammar, and their quality dictates the effectiveness of the communication system in general.

Let us take these four principles in turn and see why and how they need to be changed in the English language, for instance, to increase its potential even more in terms of man and machine compatibility. Naturally some of the following reforms may be applicable to other languages, too. For instance, the protagonists of Hindi may like to incorporate some of these ideas and try to make it a more credible proposition for national use.

First, the English language lacks sound-to-symbol credibility and there is therefore the need to reform the writing system along simple phonetic lines, thus making it fairly easy to learn to read once the sound elements of the alphabetic characters are memorised. And, indeed, there is a general trend the world over towards phonetic writing in popular advertisements. The fixed sound values of the alphabetic characters will help to standardise this trend and carry the reform to its logical conclusion. The choice of the minimum possible number of alphabetic characters to represent the commonly used sound values will immensely facilitate the task of learning and their use in machines. The less frequently used sound values can be represented on paper by the use of simple digraphs (ie, two-letter combinations to represent a single sound value).

Further, the Roman alphabetic characters will have to be redesigned in form and also resequenced. The form of the characters should be such that they are balanced, occupy the same width, and can be easily generated by a single character generating module, which will all help to facilitate all types of printing and display work. The sequence of the letters should make phonetic and visual sense and also be such that it can be applied directly to a keyboard device, eg, the typewriter, without the need to rearrange the characters.

Naturally, the legibility aspect, both in terms of man and machine application, should be the prime criteria in the design of all symbols.

Secondly, our counting system of today is a regrettable hangover from our ancestral fixation with our ten fingers. The efficiency of a counting system is dependent on the availability of useful factors and the dimensions of its base, ie, it should not be too small or too big in terms of its numeric value. The base ten in use today has only two factors (2 and 5) and the latter factor is of little use to us.

A base that is of medial dimension and with the best array of useful factors is twelve, which has 2, 3, 4, and 6 as its factors, the first three factors being nearest to unity. Our watch face of today is mainly graduated on the base twelve principle and there have been numerous attempts to 'decimate' the watch, and I mean that literally and figuratively, since the very inception of the ill-devised and quite unworkable metric system, all to no avail fortunately.

The establishment of a duodecimal system of numeration will involve the creation of two new numeric

characters to represent 'ten' and 'eleven.' The present numeric characters will also have to be redesigned to make them more distinctive and also conform to the same module that will be used to generate the alphabetic characters. In addition, forgery proof numbers, ie, numbers once written that cannot be easily altered to change their numeric value, and numbers that make sense in one plane only, may be very useful innovations.

Thirdly, though most of the world has opted for the metric system of weights and measures, we are devoid of the commonly used basic units of measurement. Before the forceful implementation of the metric system we used to use the foot=pound-second system, and these units proved their worth even though they were mostly arbitrarily derived and unlinked to the base ten. The 12-inch rule for measurements of linear dimension was admirably useful and for all I know you may still be using this useful unit today.

It is now an indisputable fact that we do not have an equivalent replacement for the old linear unit in the metric system of weights and measures. There is no ten-centimetre rule, simply because the decimetre

I O U A * E
B M P V F C
J G K R D N
T S H Y L Z
1 2 3 4 5 6
7 8 9 * * 0

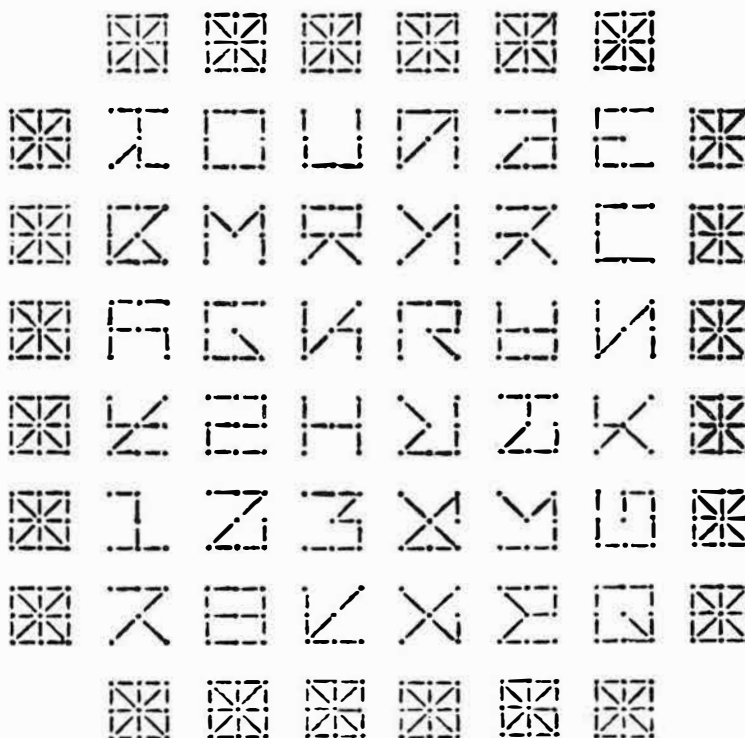
is too small a unit for linear measurements, and that in turn is due to the ridiculously small size of the basic length unit, the centimetre.

I frequently see a 30-centimetre and also a 15-centimetre rule, but neither 30 or 15 are factors of 100. Similar shortcomings are also encountered in other metric units, eg, the gramme, the unit of weight, which is also much too small for general use. It appears that we have been encumbered with a defunct system of weights and measures.

The set of weights and measures I have in mind is linked to the base twelve so that smaller divisions are not hampered in any way. The new length and time units are derived from the constant expressing the speed of light. The new length unit is 2.0174 centimetres long, correct to four decimal places. Most other units of weights and measures are extrapolated from the basic time and length units and naturally are aligned to the base twelve system of numeration.

The fourth principle, ie, the grammar of the English language, will also have to be reformed, but this can be done very gradually over a number of years. One of the most troublesome aspects of English grammar, particularly irksome to learners of the language, is the 200 or so irregular verbs which will have to be regularised.

These then, are the changes that could be applied in the case of the English language system, which could help to solve our communication problems, mainly in terms of getting people to be literate quickly and effectively and at the same time furnishing us with a set of machine compatible elements. These suggested reforms will have to be tested thoroughly by actual application to individuals and machines and their viability established beyond doubt before they can be recommended for general use.



The new set of alphabetic characters consisting of six vowels and eighteen consonants shown in the first four lines in order. The last two lines show the numeric characters, ie, eleven numbers and the zero of the

duodecimal system of numeration. All these alphanumeric characters can be created with a single module of sixteen bars. Twenty-four of these modules surround the alphabetic and numeric characters.

The age of the symbol manipulating sensory cripple

Peter Bartl

The author is currently Assistant
Professor of Art and Design in
the University of Alberta

We live at a time which might best
called the "age of the symbol
manipulating cripple."

Our technology enables us to produce
wood that looks like plastic, plastic
that looks like metal and feels like
stone, soybeans that taste like steaks,
and machines that sense, see, and hear
much better than we do.

Perhaps, as a reference point for our
sensory judgement, nature by itself is
no longer adequate. Therefore it
seems necessary that we develop
some kind of training in sensory
discrimination.

Experiments have shown that even a
short period of sensory deprivation
can turn a human being temporarily
into a hallucinating idiot, but we can
only guess how too much, too little,
or the wrong kind of sensory input
affects the way we see ourselves and
the world.

However, in this brief space, let us
concentrate on our most important
sense—vision.

We know from personal experience
that we can trust our eyes more than
any other sense. We say, "I'll believe
it when I see it."

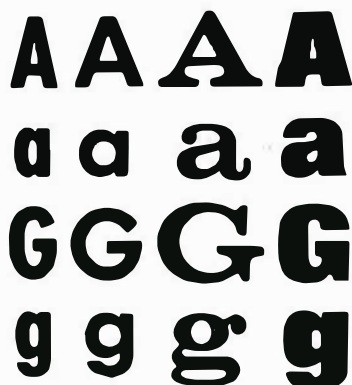
Our visual experience is basically
divided into two parts—the forms
which our eyes see, and the meaning
which our brain gives to these forms.
The two are by no means always
identical.

content versus form is a controversy
among artists that is as old as art
itself. But society in general
recognizes only content as intelligent
expression and form as incidental.

We are vaguely interested in form
when we learn to read and write in
our early school years. But after that,
when it comes to form discrimi-
nation, it is assumed that aesthetic
judgement is inborn, or that it
develops by itself.

Our society stresses the development
of verbal and literate proficiency.
Children spend hours and hours in
school reading Shakespeare and
Milton, or Moliere, or Goethe,
depending on their mother tongue.
But how many schoolchildren visit
an art gallery more than once or
twice? The public schools admit that
any kind of activity which would
further the development of visual
discrimination is considered
recreation, to be fitted in between
more important things.
Together with physical education and
crafts, such activities account for less
than ten percent of total class time.

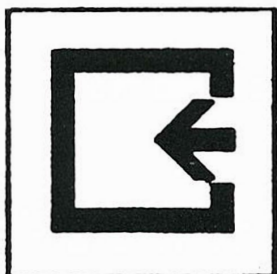
We spend hours writing essays and
solving arithmetic problems, but we
know that alphanumeric terms alone
are not always sufficient to explain
every possible concept.
For example, few people find it easy
to read and understand statistical data.
Yet pioneers, like Otto Neurath have



Many different forms, but they all
have the same meaning



Now you see it? Do you believe it?



shown how it is possible to enlist the
help of pictorial language to clarify
or explain difficult concepts.

This other mode of communication
which gives immediate meaning to
a jumbled set of figures, we may call
graphicacy. It is rapidly becoming a
very important tool of communi-
cation. It includes traffic signs,
symbols for events or institutions and
companies, charts, graphs, plans,
and other task-oriented symbols,
as well as pictures and moving images.

The main characteristic of these
means of communication is that they
depend on a precise form in order to
be clearly understood.

They have their own grammar and
syntax, based on visual perception
and psychology and, like reading and
writing, they have to be learned.

But who teaches us to read and
write them?

The teacher who asks his students for
a pictorial essay rather than a
written one, or a graphic presentation
of an abstract concept is, indeed, rare,
and gets peculiar looks from his
superiors for his efforts.

The problem, however, goes further
than that. The material used in
schools shows a complete lack of any
kind of visual consideration.
Who knows how many learning
difficulties are created through
simple frustration in children who are
not able to perceive these crude
low definition images, or who are
distracted by the redundant and
perceptually wrong details?

The low status of visual discrimi-
nation in our education perpetuates
the prejudice that verbal proficiency
is the most important and, quite
often the only measure of
intelligence.

"If you can't make it in the academic
subjects, you can still go into art."

It is this attitude which is linked
directly with the visual stupidity and
confusion created, for instance, by
commercial signs in our city streets.
This visual pollution, together with
other forms of urban decay, force us
to go through the day with our eyes
half-closed because we see only
ugliness where we want to see beauty.

Self-inflicted sensory deprivation is
a defence mechanism. We read about
10,000 verbal messages in visual form
each day, most of them originated by
small businesses. The visual form of
these messages is left mostly to the
sign-painter, the printer, the business
owner, his secretary or his wife,
all of them untaught in principles of
visual communication.

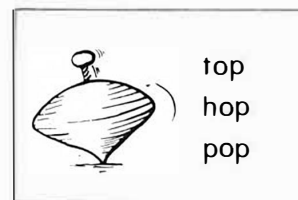
If these people had had some visual
training as part of their general
education, most of the atrocities on
our streets would be avoided.
We might also be able to understand



IBM



Possible examples of graphicacy?



Most material for our children in
schools lacks any visual consideration



instructions for appliances, so that we would not end up breaking them before we find out how they work. We would be able to read maps and charts without getting lost or utterly frustrated.

Communications in our society have become so complex that they can no longer be left to amateurs, however well-educated otherwise. National advertising has realised this: although the motivation and shallowness of the messages are questionable, nevertheless one has to admire the technical, psychological, and visual sophistication. But as soon as the result can no longer be measured in dollars and cents, as in school books, traffic signs, campaigns of public bodies, or other non-commercial uses, the visual quality drops rapidly. This phenomenon tends to make us equate ugliness with meaning, and beauty with stupidity and crass commercial gain.

Day to day communication in our society has very little to do with art. Very few artists are interested in, or qualified to create utilitarian products like school books, machines, chairs, kitchen pots, or cars. The aim for these products is efficiency first and beauty second. How many artists do you know who are interested in efficiency?

Let us stop talking "Commercial artists," "lettering artists," "applied arts," "industrial arts." To all these activities art is only an incidental. Only a person with less artistic training but a wider knowledge of perceptual principles, psychology, sociology, industrial procedures and, most of all, a keen sense of social responsibility can visualise the complex system of communication in our society. Let us then call this activity "design," not "art" and let us educate designers as designers and not as artists.

We have got to stop regarding sensory development in our children as only recreational activity and give it the same priority as reading and writing. The creation of our visual environment is not just a nice esoteric pastime reserved for a few nutty artists, kinky old ladies, and quickly promoted decorating consultants. We have to train our professional designers on a more scientific basis than that required for our visual artists.

Does more, bigger, and louder mean better?

Dick Feigler

The Regional Transit Authority just paid a design firm 25,000 dollars for a new symbol for itself. Here it is:



Now then, if you let your fingers do the walking through the Yellow Pages, you will find a symbol for the Radio Corporation of America. Here it is:



Some people claim there is a similarity.

I don't, you understand . . . I want to make it clear that I don't believe for a minute that F Eugene Smith and Associates who designed the RTA symbol stole it from RCA. After all, F Eugene Smith didn't draw anything you can't find in a can of alphabet soup.

This is a democracy, you know. F Eugene Smith has as much right as any kindergarten kid does. And certainly his choice of the letter "R" to stand for Regional, the letter "T" to stand for Transit, and finally the letter "A" to stand for Authority reflect a great deal of thought on his part.

He certainly has not sacrificed clarity for style.

A little question occurs to me though. Why, when you can't get a loop bus at 7pm, when people are complaining about stalled CTS Rapids, when many county suburbs have no bus service at all . . .

Why would you spend the first chunk of the money the citizens voted you by paying some artiste to draw three letters?

And deciding that they should be coloured red and orange and figuring out what colour busses should be painted.

Haven't they got anybody over at RTA who can print? Isn't there some old guy around with a paint bucket who paints the gender on bathroom doors who could have taken five minutes of his time with a black crayola and figured out a way to print the letters: RTA?

"We felt there needed to be a new identity," said Jay L Hanna of RTA. I know what he means. Just yesterday, I was standing at a bus stop and the guy standing next to me was twitching and sweating

and obviously very nervous.

I asked him what was the matter. "What if the bus comes along and I don't recognize it," he said.

"What if it stops here and I don't get on it. What if it leaves and I'm still standing here because I couldn't identify it as a bus?"

"Don't worry about it," I said.

"They are big, boxy things, buses are. They have lots of seats and chrome poles in them. You'll know one when you see it because a guy in a blue cap will be driving it. The door will go hisssss when it opens."

"You're talking about the old-fashioned buses," he shrieked.

"I'm worried about the RTA buses.

How will I know one of them when I see it. Suppose I try to board an RCA television repair truck by mistake? What will happen to me?" With this kind of fear in the community, I suppose we should be thankful that the RTA people shelled out 25,000 dollars for a bus monogram.

This short comment appeared recently in Visible Language, IX 4 Autumn 1975, who in turn had excerpted it from The Cleveland Press, Thursday, Sept 25, 1975. We are grateful to them both for permission to republish it here.

Begin difficult things while they are easy; do great things while they are small. The difficult things of the world must once have been easy; the great things must once have been small . . . A thousand mile journey begins with one step.

Lao-tse

First steps on a thousand mile journey—part 1

Patrick Wallis Burke

Author's introductory note:
The pages which follow are the first part of a longer article. This is intended to be read as a continuous text and its remaining sections will be published in succeeding issues of this journal.
I have three basic reasons for trying to write about the Chinese written language.
For a start, I believe that it offers the graphic designer some important

insights into the nature of pictorial communication.
Secondly, I think it forces one to consider the gains and losses of alphabetic writing.
And finally, I wanted to find a way of expressing the many surprises and delights it offers as a field of study.

duhng



To most Westerners Chinese writings look wonderfully quaint and exotic. Certainly, for those of us brought up to read and write a European language, Chinese looks startlingly different on the printed page. Instead of the neat rows of words made from a few alphabetic symbols there are thousands of unique characters, often incredibly intricate, always mysterious. They have fascinated me for a long time and recently I began an attempt to learn something of the language.

For anyone who gets hooked on Chinese there are endless surprises and delights. Opening one's first Chinese-English dictionary is a bit like peering through the fence round a willow= pattern garden. One gets tantalising glimpses of the curiosities of ancient Chinese society.

My first Chinese dictionary was, appropriately enough, a little red book—a cheap pocket edition, with such minute print that I had to use a magnifying glass to read it. I am not sure now what I hoped to achieve by buying it. I remember reading somewhere that George Borrow taught himself Norwegian by simply comparing an English and Norwegian bible. If I secretly hoped that it might be possible to teach oneself Chinese from a dictionary, then I was soon disillusioned. Nevertheless, the little red book gave me my first insights into one of the most fascinating written languages ever devised by man.

fan



Here is one of the first characters that I jotted down during my preliminary searches of the little dictionary. This character, *fan*, was defined as a noun and meant 'streamers hung before a shrine.' I was later to learn that it meant only 'a banner, or pennant,' but in my mind it still stubbornly flutters in a blue sky before a shrine.

fei



Fei represents an Imperial concubine, next in line to the queen or empress. The existence of this character argues an extra-marital openness in marked contrast to that of our western rulers. And one cannot help being struck by the rich stock of symbols that speak of an ancient hierarchy of 'women of pleasure'—courtesans, sing-song girls, and prostitutes of various kinds.

Mao Tse-Tung may have tidied all this up now, but the written symbols remain as mute witnesses to a totally different kind of society.

bih



The red book told me that this character, *bih*, was a verb meaning 'to warn people off the imperial route.' A clear indication, presumably, that writing was not invented by the peasantry.

tuoh



Whilst *tuoh*, was described as a noun meaning 'a short but thick bamboo pole used by watchmen to strike the hours.' Just how many generations of night-watchmen have signalled the passing hours since this character was first inscribed?

I am well aware of the arguments of sinologists who rightly maintain that the pictorial origins of the Chinese characters have been obscured in all but a few cases. I know also that my few Chinese students have little or no knowledge of the pictorial meanings of the characters they use so freely. But then I am equally sure that few of my English students would know that even a modern word, like

'television,' is a hybrid constructed from the Greek tele—'far' and the Latin visio—'seeing.' Our ancestors used countless metaphors to express their growing understanding of nature. Their ancient metaphors lie embalmed, but mostly forgotten on any printed page. Maybe only poets and scholars are interested in such things. But I am not so sure.

Possibly because of their strong pictorial qualities, the wish to understand the etymological origins of the Chinese characters persists. Each unique sign reverberates with life, rich in associations gathered over centuries. Or, as Ernest Fenollosa put it, "Their ideographs are like blood-stained battle-flags to an old campaigner."

icographic 10, 1976, pp 18-25
Author's address:
7 Templeton Court
Radnor Walk, Shirley
Croydon CRO 7NZ
England

shy

尸

Even when I acquired Lin Yutang's recent monumental Chinese-English dictionary, the surprises continued. It is always instructive to find out what kinds of things a particular culture chooses to put into words.

This character, *shy*, when used as a noun means 'a corpse.'

jiahn

諫

The character *jiahn*, is a verb meaning 'to urge, or to plead with.'

shy-jiahn

尸諫

Placing the two together gives us the word *shy-jiahn*, a transitive verb meaning, of all things, 'to remonstrate with the emperor by sending a letter and committing suicide.'

But it would be unfair to overstress the 'Chineseness' of this wonderful written language. Certainly it says a great deal about the thought processes of the Chinese people, but in a far more profound way it speaks equally of all that is universal in the human mind.

eur eel

如耳

Perhaps I was intrigued by Chinese writing because I had picked up so many myths and legends concerning this remarkable people.

Certainly, English schoolboys of my generation were taught nothing official about China.

As a result, we accumulated a mental picture of the Chinese nation based on all kinds of hearsay evidence. A random selection of my boyhood mind-picture would have included the following 'facts.'

I knew, for example, that the Chinese had extraordinary eating habits that allowed them to eat one-hundred-year-old eggs, as well as dogs, snakes and bird's nests. Whilst for 'chips with everything' one needed to read 'rice with everything.'

From Chinese prints I knew that China had symmetrical pyramid-shaped mountains, with clouds that ringed them only half way up—as well as lots of pagodas and hump-backed, lattice-work bridges. My mother's Woolworth's willow-pattern plates had told me all I needed to know about arranged marriages and the sadnesses of unrequited love.

From my schoolboy 'comics', I knew that all ordinary Chinese men had protruding teeth, and that the fiendish Mandarins cultivated very long fingernails.

Much more importantly, perhaps, I knew that the sexual organs of Chinese women were arranged east-west, rather than north-south.

Fu Manchu and Charlie Chan were two of the fictional models upon which I based my picture of the typical Chinaman—someone who spoke a tortured version of English called 'pidgin' and was unable to pronounce his r's.

When he wrote he used elaborate characters that were meant to be pictures, written downwards and back to front.

What I had no way of knowing was that this same system of writing was being used to record the hopes and fears of men more than a thousand years before the birth of Alexander the Great.

It is a written language that is not alphabetic. It speaks to the eyes, not to the ears.

The little sentence I have included here is meant to show something of the differences between our own alphabetic writing and the Chinese system. If you read the characters from top to bottom, right to left, they can be literally translated as; ear—hearing—not—same—eye—seeing.

Or, as we might say—"hearing is no substitute for seeing."

muh wern

目聞

jiahn bu

見不

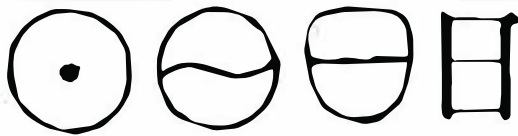
Chinese is often described as a very old language—and this is certainly true. But then it is equally true of all present-day languages. Since we can only guess at the origins of human communication, we cannot say which of the world's languages developed earliest, which later. No part of the human race lacks a spoken language, and the speech of every nation or tribe goes back to the dim uncertainty of prehistory.

In one sense, however, the Chinese language is unique. Its writing system has a history far older than any other in use today. Only Sumerian 'cuneiform' writing predates Chinese. 5,000 years ago the Sumerians were using a writing system to document their knowledge and experience. But the Sumerian spoken language vanished from the world about 3,800 years ago. And cuneiform writing,

although adopted and developed by many other peoples, died out at the beginning of the Christian era. On the other hand, the earliest known Chinese writing dates back at least 3,500 years and has continued to this day, even though the system has undergone some major stylistic changes.

Writing began with pictorial representation, and the ancestors of the modern Chinese characters were straightforward pictograms of the kind shown here. From ancient writings on archaeological relics we can see something of their evolution. These drawings show some of the changes undergone by four well-known Chinese characters.

ryh



This one means 'the sun' or 'daytime,' or, sometimes 'time in general.'

yueh



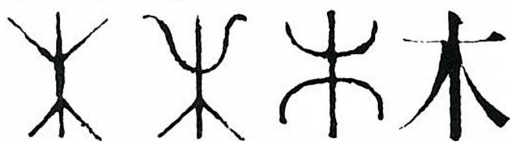
This means 'the moon' or 'month.'

ren



and this represents 'a person' or 'human being/s.'

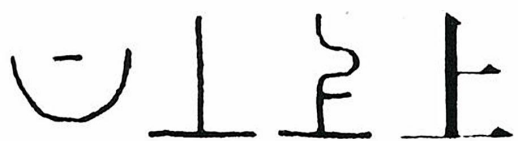
muh



whilst this still recognizable picture of a tree means, not surprisingly, 'a tree,' 'timber' or 'anything made of wood.'

It is fairly simple, of course, to draw pictures of concrete objects, but more abstract concepts must have posed problems for the ancient writers. They solved many of them by means of *diagrams* of this kind;

shahng



This character, for example, means 'up, above, over.'

shiah



whilst this one means 'under, beneath, below, or down,' and it is probable that both these symbols derived their meaning from showing the sun's position relative to that of the earth.

日 月

ryh
yueh

mirng

明

They also hit on ways of combining pictograms to create new symbols. They took the two light-giving sources, the sun and the moon, and put them together to give a new character meaning 'clear,' or 'bright,' or 'to understand.'

In our own language we often talk of 'seeing the light' when we reach an understanding of something.

人 木

ren
muh

shiou

休

The symbol for a 'person' was leant against a tree to signify the idea of 'resting,' or 'to rest.'

木 林 森

本 桑 困

muh
been

lirn
sang

sen
kuhn

The tree itself could be pictured twice to mean 'forest, or grove,' or three times, to indicate 'dense, thick with trees.'

Giving the tree an additional stroke could mean 'root' or 'origin.' Or placing three signs meaning 'the hand' above the tree resulted in the lovely character meaning 'the mulberry tree.' The busy hands in the tree speak of China's long mastery of silk manufacture, a material which they were exporting even in Caesar's lifetime. Putting an enclosure round the tree meant 'to surround' or 'hard pressed.'

人 人

renrern

chiour

囚

Writing the symbol for 'human being' twice, meant 'everybody,' whilst putting it within an enclosure meant, understandably, 'a prisoner' or 'a convict.'

ryh
chang
jing

日 昌 晶

A new character made from two suns meant 'to prosper, or thrive.' And three suns, besides being another way of writing 'bright' or 'clear,' also meant 'crystal.'

ryhbeen

日 本

The character meaning 'sun' plus the character meaning 'origins' identify Japan—the land of the rising sun.

ryhbeen-ren

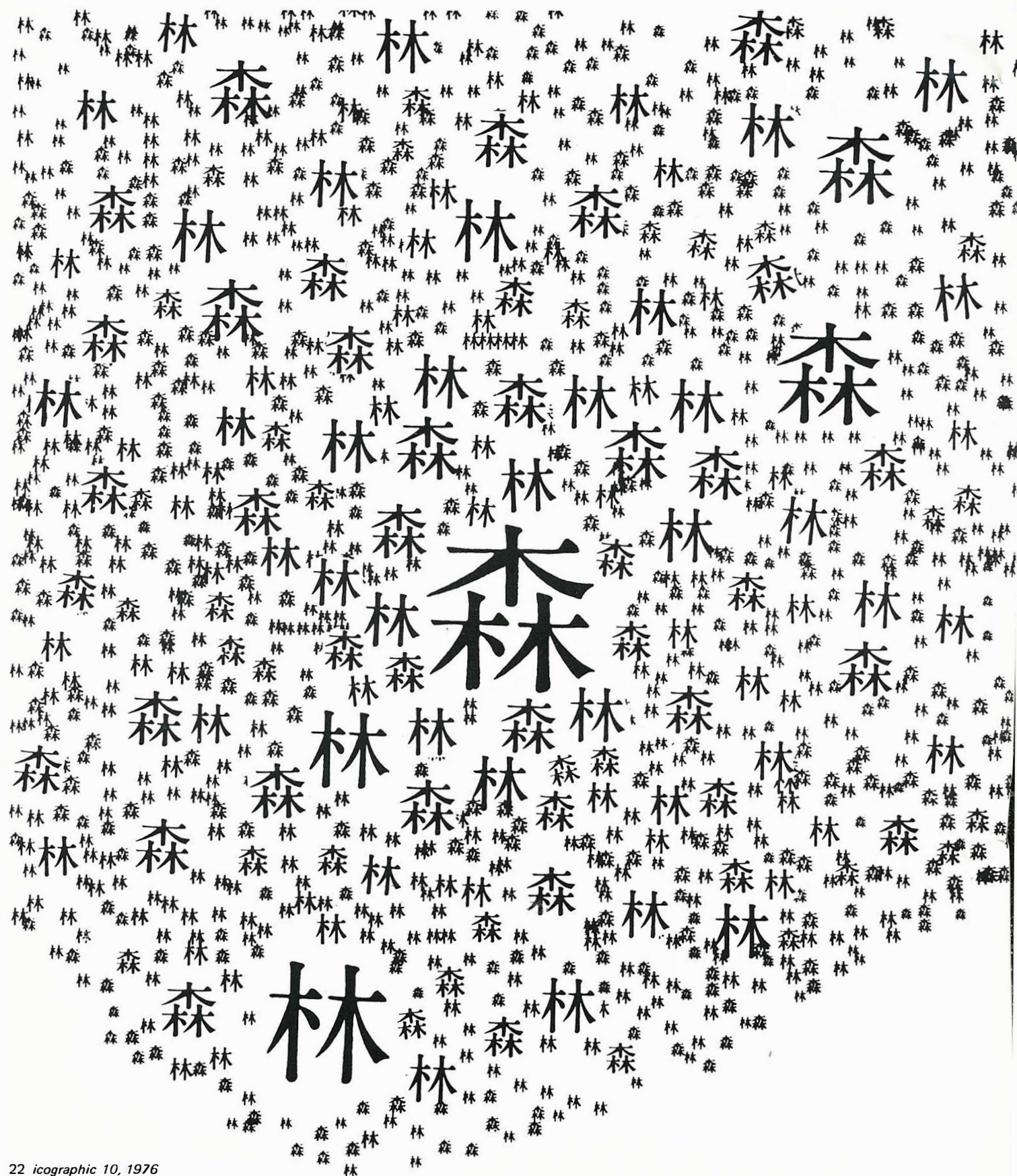
日 本 人

So by now you ought to be able to guess that these three characters represent the 'sun origin people' or, in other words, the Japanese.

The strong pictorial quality of Chinese characters is beautifully illustrated in this 'visual poem' by Ryuichi Yamashiro. He calls it 'Forest,' and few Western readers would have any difficulty in seeing why. But an understanding of the two words that he has used may show how closely appearance and meaning have been linked.

Here are the entries against each of these characters:
 森 林
 senlin, n, forest, cultivated or wild.
 森 森
 sensen, adj. & adv., dark, close, thick (vegetation).

Burke: First steps on a thousand mile journey—part 1



日 月 人 木

In the earliest known examples of Chinese writing (the so-called 'oracle bones' of about 1400BC), there is a high proportion of recognisable pictures. But even at that time there are signs that the pictorial form had been stretched to its limits and that other means were being sought to augment it. The swing from pictorialism to symbolism must have begun very early in the development of Chinese writing.

These four characters—sun, moon, human being, tree—are obviously pictorial. But other forms of characters are soon in evidence. A second group I termed *diagrams*, since their function was to explain rather than represent actual appearance.

tiarn

田

Into this category would fall this character meaning 'farm' or 'field.' It approximates to a kind of aerial view of an enclosure which has been divided up into small plots of land.

Or possibly, the lines were meant to depict the irrigation ditches that are a feature of the Chinese rice fields.

jung

中

This vertically divided rectangle means 'middle.' Again, an obvious diagram, although it might originally have been derived from a picture of an arrow piercing its target.

dau

刀

rehn

刃

The character on the left means 'knife' and was originally a pictorial representation of one. The addition of a small tick against the blade gave the character a new meaning—'the cutting edge of a knife.'

tur (guu)

凸

Two further obvious diagrams come to mind. This one means 'convex,' 'to bulge' or 'to protrude.'

au (wah)

凹

And this one means 'concave.' Even in their most primitive forms they still look remarkably like the sort of drawing an engineer would make to explain these two concepts.

shaau

少

On the other hand, this character meaning 'few' or 'less,' is supposed to have begun life as a drawing of four grains of rice and so to have symbolised a poor harvest. This explanation may be no more than a legend, of course. Many introductory textbooks on Chinese offer ingenious explanations as to how certain Chinese characters came to be invented. Sadly, many of these traditional stories have failed to stand up to recent Chinese linguistic research. Nevertheless, they serve as useful mnemonics for any beginner trying to accumulate his first repertoire of characters.

Clearly this character is not a diagram. It gains its meaning from an association of ideas, and here serves as an introduction to a third category of characters.

日 月 人 木

The *pictograms* and *diagrams* are entities—essentially of one part and complete in themselves. But there is another class of characters that are formed by the interaction of two or more characters from the previous groups. Sometimes called *associatives* or *ideograms*, they rely for their meaning upon mental association. The 'four grains of rice' character on the previous page falls into this category, and it also demonstrates how allusive their imagery can be.

Nevertheless, these thought-pictures often have a vivid quality which is unforgettable once you have seen them. The words we use and the alphabets we use to trap them have no natural connection with the thing being described—everything depends upon mere convention. Spoken words are no more than labels. Letters are no more than arbitrary symbols. Chinese writing, on the other hand, always seems to me much more like a kind of pictorial shorthand, vivid and alive.

人 人

tsung

从

Two 'human beings' as shown on the left means 'everybody,' but by depicting them one behind the other a new character is formed to represent the idea of 'to follow.'

从 人

juhng

众

Stick a third 'human being' on the top and you've got a character meaning 'the multitude,' or 'the masses.'

日 木

dung

東

The 'sun' can be shown rising behind the sign for 'tree' to stand for the rather more abstract notion of 'east.'

nyuu (ruu)

𡥉

女

Here are two more pictograms. This delightfully curvacious one means 'female,' and has developed from the earlier form drawn on the left.

tzyy

𡥇

子

And this character means 'offspring' or 'seed,' and is the now stylised version of a simple drawing of a small child.

女 子

haau

好

Bringing mother and child together gives a new character meaning 'good' or 'to love.'

The Chinese characters used throughout this article have been drawn by the author. This is because of the difficulties and expense involved in having them typeset or photoset. They have been drawn freehand and are modelled upon a well-known Chinese type-face. Confucius said, "A man's character is apparent in every brushstroke,"

and I am well aware that not only my character but my ignorance may be demonstrated in every ink-mark. I apologise in advance to all skilled Chinese readers, and all others with knowledge and skill greater than my own. I can only hope that, like some of my Chinese students' first efforts in the Roman alphabet, they exhibit a certain naive charm.

icographic 10, 1976

女

an

安

If we stay with the women a while longer we find that by placing a roof over the sign for 'female' we get one of China's best known symbols. It signifies 'peace.'

My late father, I guess, would have taken serious exception to the internal logic of this particular sign, but at least it takes a more charitable view of women than many other Chinese characters.

女

jian

姦

This one, for example, comprising a group of three females, means 'adultery,' 'debauch,' or 'ravish.' Interestingly enough, the Japanese, who learned writing from the Chinese and still employ many of the Chinese characters, give this symbol a different meaning. To them it signifies 'noisy' and this may well be more faithful to the ideas of its original inventors. But whichever meaning you prefer, both give a strong hint that inventing words, or classifying human experience, has been a male prerogative for a very long time.

Certainly the males of East and West did seem to meet over their attitudes towards women. Over the centuries, both steadfastly persisted in giving women the rough end of the stick. And that old mysoginist, Confucius, probably spoke for a good many men when he said;

*Only women and small men are hard to keep.
If you allow them too close, they show no respect.
If you keep them at a distance, they bear a grudge.*

女口

ru

如

Here we have a female and the sign for 'mouth.'
It originally meant 'follow' (because women obey orders given by word of mouth). From 'follow' it came to mean 'like' or 'similar' (since to follow was to be like), and then it came to mean 'if' (like supposing). Much of which is pretty androcentric, when you think about it.

女昌

chang

娼

You might easily imagine that this character is an ideogram. The left hand part means 'female,' the right hand part means 'to prosper,' whilst the whole character means 'harlot,' 'whore,' or 'prostitute.'

But you'd be wrong. Sadly, the linguistic pits of present-day Chinese writing are dug a bit deeper than that. It is, in fact, an example of the Chinese phonetic system at work, as you will see later.

田力

narn

男

Unlike the symbol for 'female,' which is a pictogram, the one signifying 'male' is an ideogram. It consists of two parts, one of which has been mentioned before as an example of a diagram, and meaning 'field' or 'farm.' Its second component is one signifying 'strength,' although why it should look like it does seems uncertain. One version suggests that it might have been a hand pressing down upon something. Another that it represents a man's muscles. It is clear, however, that the ancient Chinese saw masculinity as essentially 'strength in the field.'
Perhaps this particular metaphor may strike a virile, sex-conscious western male as strange. But countless millions of Chinese who lived for generation upon generation at the edge of starvation, knew what it meant. When peasants ran out of rice they sold their children as domestic servants or killed off unwanted babies

to leave fewer mouths to feed. Chinese cooking, brilliant and imaginative, evolved from the needs of making a little go a very long way. If a Chinese loses his job he says that his 'rice bowl has broken.' When he worships his ancestors, he doesn't take flowers, he offers them food. Food-getting, rather than virility, was the mark of the successful male.

This article will be continued in the forthcoming issue of this journal.

Design education and standardization

Ernest Hoch

The author teaches at Reading University and practises in London. He is chairman of the Icograda Standardization Commission



Some of my friends in Icograda claim that whatever the subject under discussion, the chances are that I shall somehow link it with *standardization*.

Some of you, too, may have wondered whether the title of this contribution does not reflect the contributor's one-track mind, rather than a significant intrinsic link.

Fortunately, I am on very firm ground here, and those who recall *icographic 3* (the issue I was invited to guest edit) will have known all along.

I shall start my exposé with a quotation from Walter Gropius, and add to it another statement concerning standardization.

The Gropius quotation is the same one which, in *icographic 3*, prefaced the article "A standard specification system for print production" by Maurice Goldring and Angela Hackelsberger:

"Standardization is not an impediment to the development of civilization but, on the contrary, one of its immediate prerequisites. A standard may be defined as that simplified practical exemplar of anything in general use which embodies a fusion of the best of its anterior forms."
(*The New Architecture and the Bauhaus*)

As to the link between *understanding standardization* and *understanding design*, we may characterize a standard specification as a manner of *pre-empting certain decisions* which limits significantly the scope of subsequent decision-taking in the particular context, and thereby defines the boundaries within which freedom of choice remains.

Such a description does not only touch upon the fundamental question of the relationship between *freedom* and *restriction* on it, between creativity and a framework of constraints. In so doing, it focuses on an aspect which is central to the design process.

If we accept that in the field of design education, presenting concepts as such, for students to operate with, is less useful than developing the students' own concept formation;

if we further accept that concept formation, in design teaching as in other teaching, is aided by discussion and analysis of a variety of concrete examples; and that familiar examples from the students' own experience, lend themselves best to that purpose:

then we must look for and closely study instances from our students' everyday life. And, as their experience grows in making choices, in taking decisions in their practical

work by which they limit the scope of subsequent decision taking, use these to help them attain these concepts.

Take, for example, a subject students are familiar with long before they set out to become designers. We all know that being deprived of the freedom to decide whether to drive on the left or on the right was necessary for safeguarding our freedom to use the road at all, with the expectation of fewer delays and less frequent accidents.

To express it differently: the pre-empting of the decision on which side to drive—in itself a restriction on the freedom of individual decision taking—represented the immediate pre-requisite of increased freedom and safety for vehicular traffic.

But let us look at this particular example more closely and observe certain characteristics shared by standardization and design.

Firstly: the restriction of individual freedom did not become a precondition for civilized behaviour on the road as long as density and speed of traffic stayed within the limits of capacity for effective eye-to-eye contact, or verbal exchanges, between individual road users.

Note that, as in many design contexts, we are dealing with a *developing* situation: there is not one, timeless, answer to a design task, but the answer may turn into its opposite as significant criteria change with time.

Next: pedestrian traffic does not need all-embracing standardization in respect of left or right. In certain locations, however, or at certain times of day, such restrictions on the freedom of each individual clearly become the precondition for any kind of freedom for the total user population. (It may be interesting, by the way, to reflect that the problem is one of human road users only: animals, being better at eye-to-eye contact than humans, will not normally come to a halt by blocking each other's way unless directly controlled by humans).

Note again, the analogy with many design contexts: the answer to the problem is not a matter of making up one's mind whether to choose A or B, but of defining the conditions under which to change from A to B or back again.

We can use the familiar arrangements for intermittent application of a norm to prompt the concept of flexible design solutions in the interest of *as many users as possible*.

Developing this last thought further in the context of standards, one can

teach a concept which tends to be more familiar to product designers than to graphic designers: the concept of designing to satisfy the needs of a defined part (say 90%) of the total user population, and providing separately for those at the extremes of the distribution curve.

Having looked at the subject of this contribution in terms of the relevance of standardization to design, let us now approach it from the other end.

A designer arrives at the decision to choose Monotype Imprint as the typeface to specify for the setting of a particular publication. He has thereby assured for himself, let us say, the necessary range of mathematical symbols, etc, which his text requires. But for the sake of orderliness within the particular publication, of co-ordination within related publications, for the sake of whatever other, well considered implications, he has now precluded a number of subsequent choices he might otherwise have kept open.

He has, in effect, *determined a standard* and is from now on working within the decision-taking framework his previous decision established. Let us leave him for a while and shift our attention from the design of a single item, or a series of related items, to the design of a complex system of inter-related categories of items such as are involved in the design of a corporate identification project, the design of a major public information system or any other system on a comparable scale. The decisions made in the process of the work need to be co-ordinated within a coherent system which, in many large organizations is literally referred to as 'standards.'

Until now I seem to have been taking it for granted that you go along with me and are willing to discuss methods of including concepts of standardization in our teaching of design. I have delayed answering the question *why* we should concern ourselves with this whole area.

I wanted to establish first (and hopefully convince those among you who may doubt the relevance of that approach) that the concepts underlying standardization, and those at the very heart of design activity, are quite intimately related, indeed to some extent identical.

My first answer to the question *why* there should be no design teaching without explicit reference to standards work is its immediate relevance in terms of *working method*.

My second answer has to do with our collective professional conscience: in professional terms, I think we must consider it deplorable if anybody sets out to design, say,

a stationery range for a client in ignorance of national standards governing window envelopes; or if a designer handling technical or scientific information were not to comply with international standards for representing quantities; or, to give a last example, if any of us designed a beautiful range of garment labels in ignorance of national and international standards relating to the information these should give for the protection of the user.

All this ought never to happen any more than an architect or structural engineer ought ever to design and specify a building that will not stand up to foreseeable stresses.

If we condemn such instances on grounds of professional integrity, surely we must condemn on grounds of *educational integrity* the omission of relevant teaching, let alone the positive inculcation of an attitude of ignorant unconcern.

Of course, we cannot teach, we cannot ourselves know about, *all relevant rules of the game*. But we can teach and should teach an understanding and awareness of *what questions to ask*, what kind of information to look out for in the context of whatever design task is in hand.

I certainly do not advocate slavish adherence to standards. A designer needs to know (and a student needs to learn how to judge) whether a particular design should be treated as a special, non-standard case. Of course, a responsible designer will, under certain circumstances, depart from a standard *but he will do so knowingly*, not out of ignorance.

This brings me to my next important point: standards can be silly. Let us return to our colleague who chose a particular typeface for the book in hand. His initial decision, his *standard*, may be appropriate or inappropriate, useful or awkward, ingenious or stupid.

That applies equally to a standard laid down for an individual design item, a coherent range of items, standards formulated for a firm, an industry, national or international standards. A firm may find itself saddled with silly standards, perhaps because its designer was not up to the mark; perhaps because the Board over-ruled the designer and insisted on certain decisions the implications of which became obvious only much later. An industry may be so saddled because of some peculiar historical accident: such an accident was at the cradle of the Anglo-American point system—the accident of the extraordinarily rapid concentration capital in the American typefoundry industry which made the point size

of one particular foundry into the standard of the entire industry—a standard which was immediately criticised for being unscientific, arbitrary, unrelated to either inch or metre. This particular matter is, of course, the subject of one of Icograda's international campaigns which we have now carried right into the International Standards Organization.

If, as I hope, you accept in principle why our teaching should embrace a positive attitude towards standards work, the question arises *how* should we involve our students.

I think we should be careful not to treat concepts of standardization as if they belong to a different world and have to be grafted onto design teaching. We should, as we guide our students through design experience, make them aware of the implications which some of their decisions have on subsequent choices; develop their understanding and discrimination between choices which do, and which do not, significantly limit their options.

Members who are practising designers as well as teachers know the value of bringing to their teaching concrete experiences from their practice.

In the same way, those engaged in standards work, be it in Technical Committees of their national standards bodies, or at the level of the International Standards Organization, should feed into their design teaching some of their experiences in that work.

Besides members' involvement with national standards work, Icograda takes part in the work of ISO Technical Committees on Signs and Symbols (145), Graphic Technology (130), Documentation (154) and others.

There is a wealth of experience that we collectively hold, and which ought to be used to enrich design teaching.

Perhaps it will be of use and interest to you if I concluded my contribution by relating one or two things we do in the Department of Typography and Graphic Communication at the University of Reading, England.

Several members of the departmental staff serve on Technical Committees of the British Standards Institution. Among these is a documentation committee where work is in progress on the preparation of an entirely new standard for the presentation of information in tables, graphs and charts. Students are made aware of our work on that committee, and senior students can see the direct connection between such work and problems they encounter in their

course work.

When a BSI committee, chaired by an SIAD member, recently revised the British Standard on *copy preparation and proof correction*, there was a student run group in being in the department which studied the same subject, compared standard conventions in several countries, discussed the implications of various approaches, and offered comments to the BSI committee. And those students most active in that protracted working group certainly learned a great deal—both about the subject matter itself and about the way standards are created and revised.

To the Editor:

It would be a pity if readers of Victor Papanek's contribution to *icographic 9* failed to recognise it as the old entertainer's old song-and-dance number, as played world-wide to delighted audiences, and were tempted to take the arguments seriously.

It is always easier to set up an Aunt Sally and knock it down again than it is to tackle the real problems; and if the Aunt Sally is ornamented with seductively horrible features, and the knocking down is done with eloquence and style, the performance can be relied upon to pack them in and wow them in the aisles.

However, another use of comedy is to make propaganda: and even though I run the risk of making myself conspicuous as the only person not laughing while Punch is belabouring Judy, I feel that there are one or two lines in Papanek's piece that he ought not to be allowed to get away with without some protest from the audience.

Papanek sets up ten 'myths' about graphic design education which he says that educators have taken from the public or invented for themselves, and distinguishes six directions to which he says graphic design and graphic design education seem generally to be dedicated (if indeed one can be dedicated to a direction).

The labelling of statements as myths does not turn them into myths, or tell us anything more about the statements themselves than we would learn if another speaker were to label them as gospel: all that we learn from such labelling is that the labeller is attempting to prejudice us against the opinions contained in the statements. Evidently this is being done mainly for effect—nobody can seriously maintain that design does not have to do with production, or that it does not solve problems—but examination of the paragraphs which follow the statement of each 'myth' shows that Papanek is heightening the effect by the use of a device which is not, or should not be part of the legitimate apparatus of argument. This is the use of the word 'design' to denote both a whole subject and a very restricted part of that subject, without distinguishing between the two usages. He castigates a type of industrial design which existed in the late 'fifties' and early 'sixties'—a sort of design for conspicuous consumption—and then generalises statements, which are quite properly made about this small and now almost obsolete part of industrial design, to anathematise the whole field of graphic design and graphic design education, and all its practitioners. For the sins of one

fountain-pen designer we are all condemned.

As long as we realise that Papanek's fluent vilifications are directed not towards graphic design as it is, but towards graphic-design-as-he-chooses—to-define-it-for-the-purposes-of-the-firework-display, we can sit back in our seats and enjoy the show. But there ought to be a note in the programme, or perhaps a little band of demonstrators outside the theatre, to remind us about the six true directions of graphic design education:

- 1 To develop student's confidence in their own ability;
- 2
- 3 To develop their power of analysis;
- 4 To develop their faculty of critical judgement;
- 5 To teach the primacy of the message.
- 6 To introduce them to the techniques of graphics production, both small-scale and large-scale;
- 7 To allow them to discover the pleasure of properly practising a craft

Our job as educators is to give the students the tools: it is for them, not for us, to decide what the job should be.

Richard Southall
University of Reading
Department of Typography
and Graphic Communication

Problem solving in the man-made environment

Michael McCoy

The author is currently Co-Chairman of the Department of Design, Cranbrook Academy of Art, a position which he shares with his wife Katherine. At the recent Edugraphic design conference in Alberta, they discussed and illustrated the work of their Academy and this short article details one of the projects undertaken by their graduates

The Cranbrook Environmental Education Project

In the fall of 1974 the Design department of Cranbrook received a grant from the State of Michigan through the Michigan Council for the Arts to design a curriculum on *The man-made environment* for the grades 6-9 in the state school system. The programme is designed to expose students to problem solving as it relates to the man-made environment. It developed into an active, project-oriented program as a result of research conducted which supports participatory education. Concentration is on the performance of the environment rather than its objects. Through student recognition, definition, analysis, and solution of environmental problems the program

has as its goal the development of a more design-literate citizenry. With the exception of small portions such as the writing of individual projects and the execution of specific images, the program is the result of a total group effort. Organization, project generation, writing and production are the product of five research assistants—Meredith Davis, Robert Meganck, Doug Snyder, William Whitely and Patrick Whitney—and the faculty director, Michael McCoy.

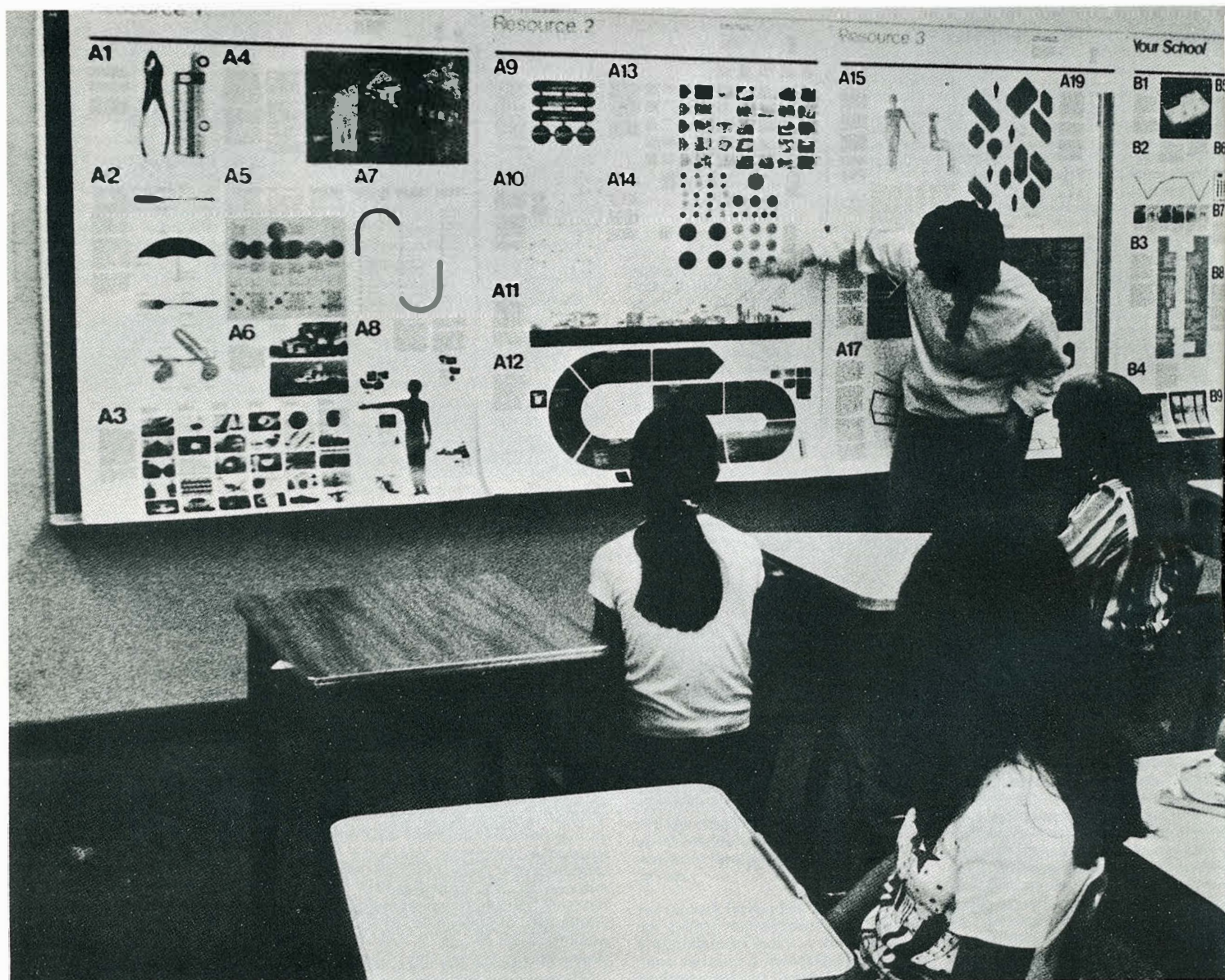
Research

The team researched the problem of environmental education in the public schools in two general areas.

The first was to evaluate existing materials that might influence content direction or presentation format for our project. We found that with the exception of the work done by Richard Wurman and Alan Levy, Philadelphia architects and founders of the *Group for Environmental Education (GEE)*, little had been done in the field of education about the man-made environment. Numerous programs exist dealing with biological discussion of the natural environment but most ignore the interface between the natural and man-made factors in our environment.

Few offered any concrete suggestion for student involvement in solving environmental problems. Issues were examined in a "third person" fashion with the student role being undefined.

Program formats varied. Some took simulation approach providing game boards and pieces; these materials were not well suited to large public school classes of thirty or more students. Others, such as SCIS program for science education, were elaborate participatory kits providing everything needed to conduct experiments outlined in individual student manuals; the immediate convenience of these kits seemed to be outweighed by expense and reordering time (packets of dirt, insects, student manuals, etc). Media extravaganzas were not only



prohibitive in cost but also required a passive student role. Textbooks communicated valuable information but also ignored the participatory aspect. Wurman and Levy's approach using individual workbooks, combined listing and simulation techniques with narrative for the most effective method of presentation we had seen to date.

The conclusion of the research team was that none of the materials we examined went far enough in its exploration of teaching techniques. The participatory nature of learning had yet to be exploited to the fullest as did the tapping of firsthand resources and situations. Accessibility of materials needed to be considered. The cost needed to be held within teachers' discretionary budgets, bypassing complex ordering procedures.

During the research phases, the team interviewed in-field teachers to determine the place the program might hold in the educational process. A group of teachers were chosen for their educational philosophy, the geographic location of their school, and the grade and

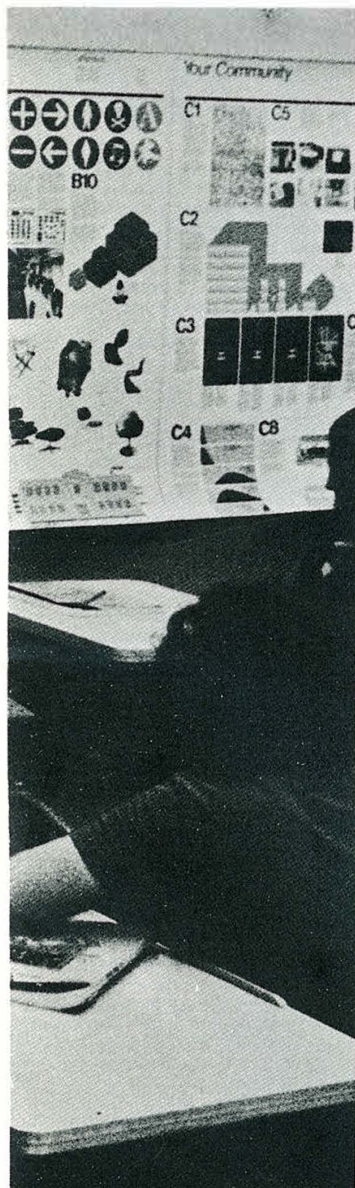
subject which they taught. Teaching situations varied from the traditional setting in a Detroit city elementary science class, to a nongraded open classroom at Upland Hills Farm where all educational content is taught within the context of firsthand environmental situations.

The current emphasis in education towards participatory educational activities and personal value clarification seemed to indicate that the time was right for a program that involved students in the evaluation and manipulation of their environment. Most teachers indicated that the social studies program would be the easiest place in the educational program to implement a curriculum such as ours. That discipline seems

to be in a state of transition from a historical, "names and dates" approach toward a more humanized orientation that stresses the social climate in which events occurred.

Many teachers indicated a general trend in education away from categorizing disciplines toward an interdisciplinary approach using an innovative program.

Teachers were questioned about student readiness to comprehend the concepts of "process" and "interrelationships." Most recognized the middle school age group as the start of such understanding and emphasized the need to nurture this development.

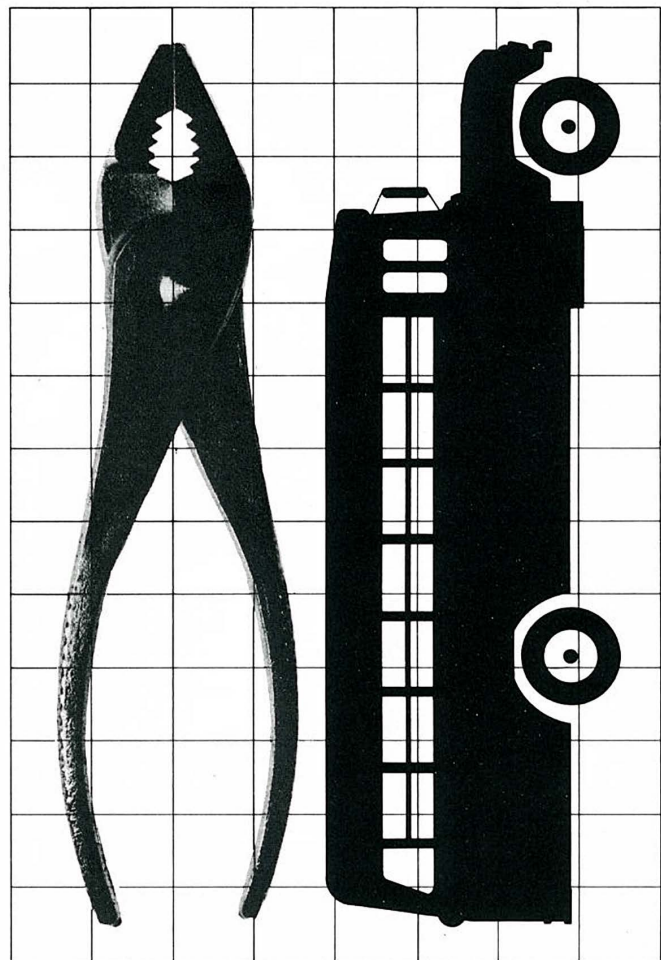


A1

How is a bus like a pair of pliers?
 They are both tools for accomplishing certain tasks. The pliers are a tool for gripping objects and the bus is a tool for transporting people.

If you can think of buildings, trains, radios, and even your own home as tools for accomplishing certain tasks then it will be easier to decide if the tool is performing the task well.

Our expanded idea of tools can allow us to look at all the features of a particular tool and decide whether they help the tool do its job or not. Here are some examples of tools and their features. Select an object in your surroundings and see how many features you can identify that make it a useful tool.



Left, a teacher and class using the system of wall charts that act as the starting points for a range of projects

Above, the first chart in the series entitled Resources. In this unit projects are planned to introduce and define the basic concepts of the entire program. Through class discussions and short active projects the students are asked to think of man-made

objects as tools having particular performances. This enables them to understand the reasons for a tool having particular features and how these features affect its performance

The team also inquired about the logistics of a participatory environmental education program. Were teachers permitted to take their class out of the classroom to experience, firsthand, environmental phenomena? Would obtaining materials directly from the environment be difficult? Could existing environments be rearranged and manipulated to test solutions to assigned problems? Would the administration object to such activities? How much time could be devoted to the program?

Answers to some of these questions led us to believe that the most successful direction would be one that employed simulation devices when actual manipulation was inconvenient and included activities of relatively short length that could be interrupted at regular intervals without interfering with the learning process.

Most teachers interviewed appeared uninformed on issues concerning the man-made environment, pointing out the need to educate the teachers as well as the students.

The diversity of teaching styles and district policies inferred that the program should be flexible, allowing for teacher modification of problem approach.

Two sixth grade classes at Crissman Elementary School in the Utica, Michigan School District, served as a test group. Curriculum advisors and concerned parents gave the team valuable feedback regarding curriculum content, presentation methods, and program introduction. The Utica School District plans to include the program in their summer curriculum in 1975.

Two further units in the section dealing with Resources.

A7 deals with transportation of an object. In this project students will identify and describe the various tools used for transporting an object from its point of origin to its destination. After reading and interviewing people to determine which tools are used, they will make flow charts showing the various stages in the transportation system. Following this the class will discuss the information presented on each flow chart and describe the particular function of each tool.

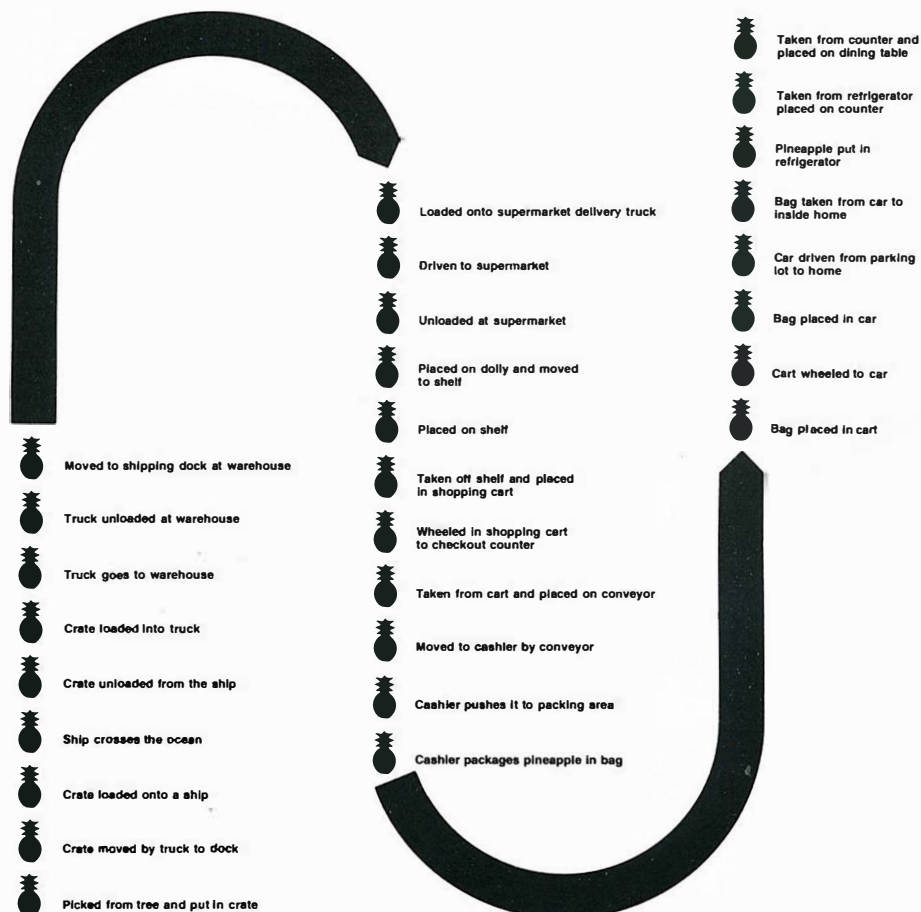
A18 introduces students to the underlying principles of structure and allows them to test out this understanding by designing a bridge. In this project students will use both a method for solving a problem and basic structural principles. Using a specified problem solving process students will design and build a bridge made of paper and glue that is required to support a brick. After testing the solutions they will discuss features of each bridge that either helped or hindered its performance.

A7

Transporting an object or person from one place to another involves many varied methods of transportation. The simple act of picking an object from a shelf is a form of transportation. We usually think of

transportation as only involving cars, buses, planes, and trains when in fact there are a multitude of transportation activities. The flow chart shown here gives you an idea of how

many different methods of transportation are used to transport a pineapple from the tree to your dinner table. Trace its movements from start to finish.



It became evident that our program could not equally satisfy the needs of a traditional classroom teacher who relied heavily on lecture, passive student roles, and a rigid classroom discipline, and the needs of an innovative teacher. Consequently, the needs of the conventional teacher were subordinated somewhat to those of the more innovative teacher.

Our research resulted in the formation of a matrix which crossed educational materials (existing and future) with a set of educational needs. The educational needs identified the three primary participants in the education system: the student, the teacher (teachers were classified as conventional or open classroom, so as to indicate the polar extremes on a teacher continuum), and the school administrators. Materials were processed through the matrix receiving a point value relating to how well they met each educational need.

The program

The program package contains a teachers' guide, student worksheet masters, and five large posters. The teachers' guide contains objectives and procedures for seventy projects, and provides the teacher with background information, discussion material and evaluation methods for the concepts presented in the program. The guide includes student worksheet masters which can be reproduced through xerox, or other duplicating methods. When

completed by the students the worksheets will collectively form a record of their activities. The posters contain general resources and project referral information, serving as large graphic interpretations of the program concepts.

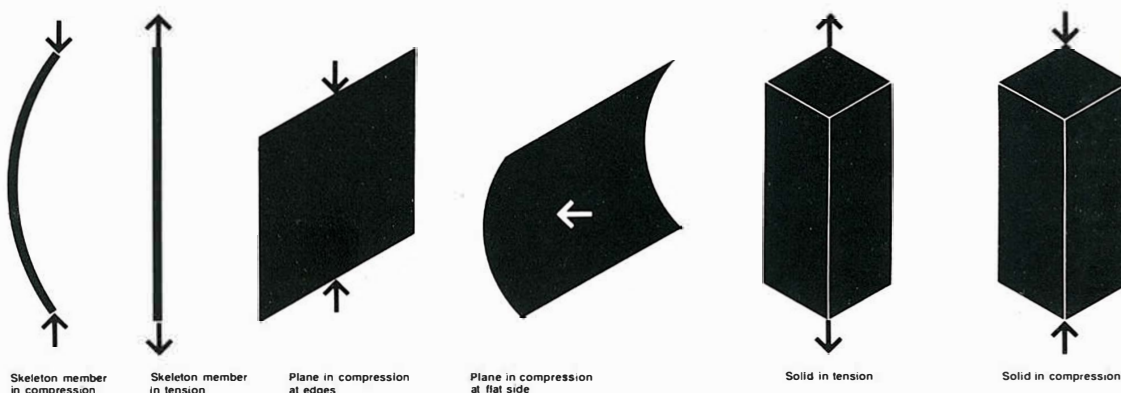
A18

Introduction to structure

There are three structural families, of which all natural and man-made things are members or combinations of members. The three families are the skeleton, the plane, and the solid. The strength of the skeleton is along its length. An example would be a steel rod or a cable. The strength of a plane is not only in its length, like the skeleton, but also in its width. The strength of a solid is in all directions. It will not bend regardless of the direction the force comes from, for it has strength in its length, width, and depth.

There are three forces fighting a structure: tension, compression, and shear. Tension is the force tending to pull a material apart. In the case of a trapeze artist, the ropes and the man's arms are both in tension. Compression is the inclination of a material to push together and squash. One man standing on another man's shoulders is an illustration of compression. Shear is the term used when two forces push on a body in opposite directions but not on the same line. A pair of scissors is said to shear paper because the force of the two blades pushing in opposite directions "shears" the paper in half.

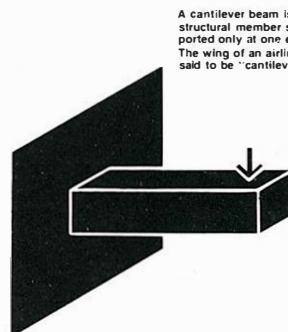
One of the most common stresses exerted on a structural member is "bending". This is a combination of compression and tension. If you grasp a stack of papers tightly in both hands and bend them, the bottom papers will tear and the top will crumple, thus illustrating the different stresses. The bottom papers tear due to tension, and the top crumples due to compression.



Skeleton member in shear



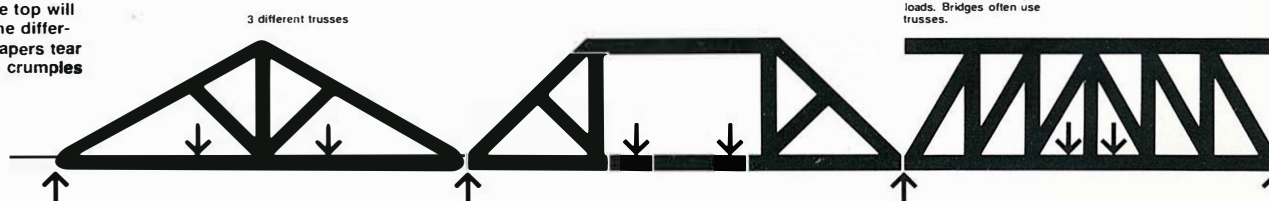
Bending solid



A cantilever beam is a structural member supported only at one end. The wing of an airliner is said to be "cantilevered."



A triangle is the strongest geometric form. A triangle can be used to create solid or three dimensional objects, or combine with other shapes to create a highly rigid structure.



3 different trusses

A "truss" is a structural framework made up of triangles and other shapes which uses both compression and tension members to carry loads. Bridges often use trusses.



Basic concepts

The program examines the man-made environment as a complex of tools that perform; a space suit performs as shelter, a telephone performs as communication, and a cup performs as a container. Tools can be analysed in relation of how well they perform, their degree of efficiency. If a tool is inappropriate for the performance required, it is a misfit. A misfit causes friction. Efficient functioning occurs when the tool fits the performance required and there is no friction.

A tool is an instrument used to perform a specified task.

Performance is the way something works.

The man-made environment is the complex of tools and performances made by man.

In dealing with the environment problems have occurred because we typically ask for objects rather than the performances: we ask for more expressways to accommodate more automobiles when the real problem is a need for more effective transportation. For intelligent design to occur we must first determine the performance needed and then work to meet that need.

The program deals with six performances. Through analysing the functions of shelter, communication, transportation, contain/support, recreation, and maintenance, the student develops an understanding of the man-made environment and its cause-effect relationships.

As defined in the program:

Shelter is the protection of people or things from hostile forces in the environment.

Communication is the transmission of information between people or things.

Transportation is the physical movement of people or things from one point to another.

Contain/support is the holding of people or things within fixed limits.

Recreation is enjoyable activity pursued as an end in itself.

Maintenance is the preservation of the existing environment from failure or decline.

Comprehensive units

The program is organized into three comprehensive units: *Resources*, *Your School* and *Your Community*. Each unit contains about twenty projects in which the students study the tools and performances previously mentioned.

B2 is one of the projects undertaken in the unit entitled Your School. Projects in this unit expand upon previous projects by having students analyse tools within a familiar and immediate environment. Using methods such as building models and making environmental notations, students will study objects and spaces in the school as tools for particular purposes. They will identify tools which are misfits for the required tasks and recommend changes or design new tools that will improve the performance.

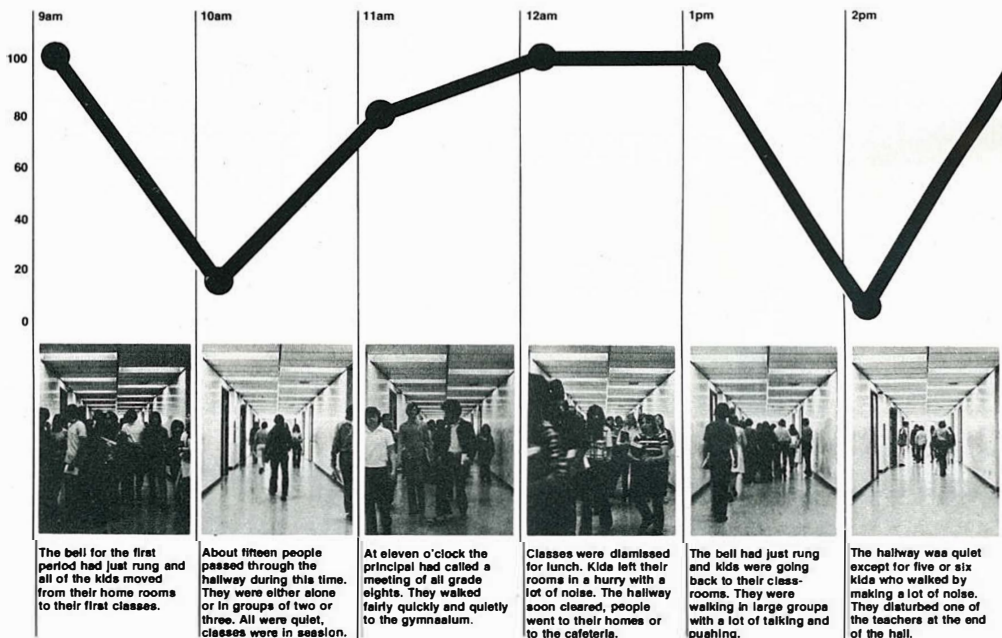
Through lack of space we are unable to show any projects in the third unit entitled Your Community. In this unit students will study more complex tools and performances with which they are frequently involved at the community level. Because of the large scale area of concern they will make maps and charts to help in their understanding of the interrelationship between the various tools and performances.

B2

Space use analysis

The accompanying chart is an example of how to combine three different but related sets of information. This kind of chart is a good way to record the use of a space or an object over a period of time. The graph shows the amount of people using a hallway for five minutes every hour. The photographs give visual impressions of the kinds of activity in the hallway at each time and the writing under

each photo is a description of various activities that take place during each time period. A chart of this kind is very useful in discovering problems that may exist in your environment. Can you think of other ways to record this kind of information?





The International Council of Graphic Design Associations was founded in London in April 1963. Its headquarters are in Amsterdam. ICOGRADA is an association of independent Member Associations. Membership is open to societies of professional graphic designers and organisations concerned with the training of designers and/or the raising of graphic design standards. Member associations are elected at the biennial General Assembly, which elects also the Executive Board, determines policy and over-all activities and agrees financial arrangements.

The aims of ICOGRADA are:

- 1
to raise internationally the standards of graphic design and professional practice by all practicable means.
- 2
to collect and exchange information on professional, educational and technical matters.
- 3
to improve graphic design training and to assist the interchange between countries of graphic designers, teachers and students.
- 4
to organise exhibitions, international assemblies, congresses and symposia and publish documentation on graphic design and visual communications technology, including a News Bulletin.
- 5
to act as an international forum for co-operation and exchange of views between designers, organisations representing professionals from allied and other fields and those of commerce and industry.
- 6
to encourage the better use of graphic design and visual communication as a means to improve understanding between people everywhere.