



Published by Pergamon Press Limited
Oxford/New York/Paris/Frankfurt

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of Graphic Design Associations

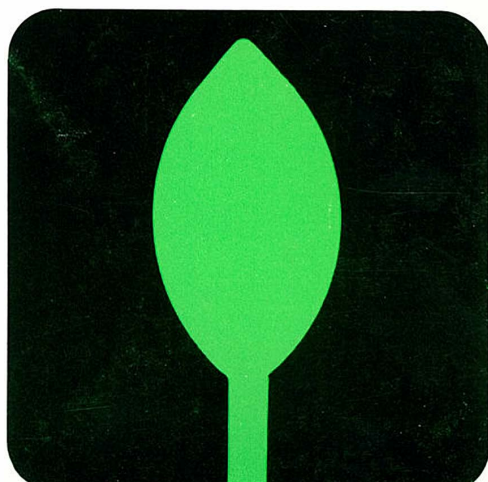
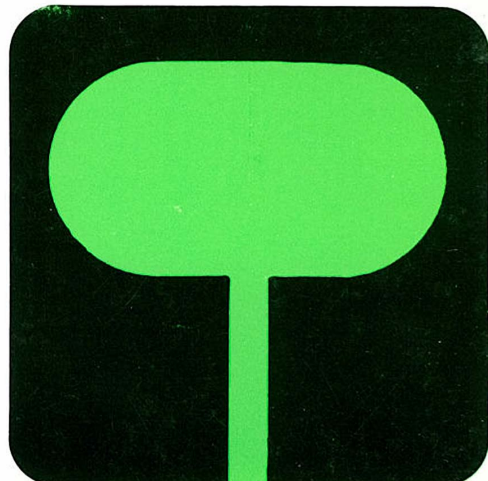
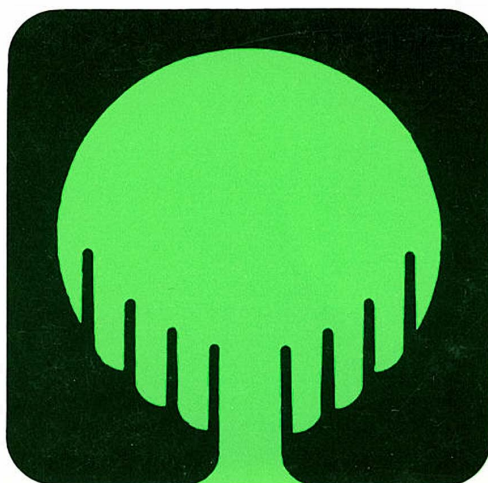
Contents include

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Speculative signing system from
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TENTH ANNIVERSARY: 1968-1978

LEONARDO

INTERNATIONAL JOURNAL OF CONTEMPORARY
VISUAL ARTISTS



From: F.J. Malina: *Electric Light as a Medium in the Visual Fine Arts: A Memoir*, *Leonardo*, Vol 8, pp. 109-119, 1975.

Subscription Information

Published quarterly

Annual Subscription (1978) US\$72.60

2 years (1978/79) US\$137.94

Reduced subscription for individuals US\$15.00

FREE SPECIMEN COPY AVAILABLE ON REQUEST

Sterling prices for journals will be sent to UK and Eire customers on request

Prices include postage and insurance

All prices are subject to change without notice

Founder-Editor: Frank J. Malina, Boulogne-sur-Seine, France

Aims and Scope

Leonardo is a quarterly international professional archival journal for artists, art teachers and others interested in the contemporary visual or plastic fine arts.

Illustrated articles by artists are published which deal with aspects of their work, with no restrictions on artistic tendency, artistic content and medium.

Leonardo also contains articles on developments in the other arts, on new materials and techniques of possible use to artists and on subjects in aesthetics, architecture, education, the natural and social sciences and technology.

Selected texts of a special character are published in the *Documents* section. Also included in the Journal are the following sections: *Terminology*, *International Science-Art News*, *Aesthetics for Contemporary Artists*, *International Opportunities for Artists*, *Calendar of Events*, *Books and Letters*.

Partial Contents of Volume 11, Number 1

K.K. HEBBAR with S.I. CLERK: A memoir on the work of a painter in India

JOHN H. HOLLOWAY: Implementation of notions of science in some of my reliefs and drawings

EDVARD ZAJEC: Computer art: A binary system for producing geometrical nonfigurative pictures

EDMUND BURKE FELDMAN: A socialist critique of art history in the U.S.A.

CHARLES G. GROSS and MARC H. BORNSTEIN: Left and right in science and art

FRANK BROWN: Computer music produced with the aid of a digital-to-analog converter

ALBERT GARRETT: Report on *Color 77*, Third Congress of the International Color Association (AIC)

JORGE GLUSBERG: 1977 Symposium on Video and Communication, Barcelona, Spain

PAUL HUBBE and NANCY HUBBE: Inexpensive stage scenery made from materials for paper manufacture

PIERRE BOULEZ: Technology and the composer

GERHARD CHARLES RUMP: The possible impact of comparative ethology on the analysis of works of art



PERGAMON PRESS

Headington Hill Hall, Oxford OX3 0BW, England
Fairview Park, Elmsford, New York 10523, USA
75 The East Mall, Toronto M8Z 5W3, Canada

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Published twice-yearly by

Pergamon Press on behalf of
The International Council of
Graphic Design Associations
all correspondence to
Warren House
St Paul's Cray Road
Chislehurst, Kent BR7 6QA
England

Printing of issue number 12

Pan Litho Limited
172-176 The Highway
London E1, England

Design and layout of issue number 12

Patrick Wallis Burke

Acknowledgements to

School of Graphic Design
Ravensbourne College of
Art and Design

Annual subscription rates

United Kingdom and Eire
Subscription rate for 2 issues
(including postage and insurance)

£3.50

Rest of the world
Subscription rate for 2 issues
(including postage 2nd Class Airmail)

10.00 US Dollars

All subscription enquiries to

Subscription Fulfilment Manager
Pergamon Press Limited
Headington Hill Hall
Oxford OX3 0BW

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.

Publishing and advertising offices

Pergamon Press Limited
Headington Hill Hall
Oxford OX3 0BW

Pergamon Press Limited
Maxwell House, Fairview Park
Elmsford, NY 10523, USA

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**Cyrillic Gothic: formal modifications
to the design of a Russian typeface**

Andre Gurtler and Christian Mengelt

The authors describe some of the
problems involved in designing a new
four-weight, sans-serif Cyrillic type-
face. Their text and its illustrations,
show how individual characters were
modified so as to give an overall
consistency to their proposed
alphabet.

**Signing system for an Argentinian
new town**

The article describes and illustrates a
signing system developed for a new
Argentinian town.

The scheme, besides attempting to
provide a rational visual communi-
cation system for this particular
housing complex, was also designed
to serve as a possible model for other
developments of this kind throughout
Argentina. The scheme makes
extensive use of pictographic signs.
Many were developed to serve as a
means of identifying the various
facilities offered by the housing
complex—schools, shopping centres,
supermarkets, cinemas, etc.
In addition, each of the sections,
streets, patios or plazas, were given
identifying names which could be
portrayed pictorially.

The language of colour

Tom Porter and Byron Mikellides

The authors argue that colour is a
language that, to some extent,
modern man seems to have forgotten.
As a result, the way in which we use
colour in our everyday world is
almost completely arbitrary, since we
have lost the ability to manipulate
either the biological or symbolic
languages of colour.

They instance much interesting
research into the effects of colour on
human performance and motivation,
and they point to a wide discrepancy
between popular colour preferences
and those of the 'sophisticated' archi-
tect and designer.

They believe that designers need to
learn far more about colour and that
this, in turn, might prompt a far more
adventurous use of colour in our
present-day environment.

Isotype in the USA

We publish a further selection of
pictographic symbols produced in
America by *Pictorial Statistics Inc.*,
under the direction of the late
Rudolf Modley. They date from the
middle of the 1930s to the beginning
of the 1940s.

They already display a certain amount
of period charm, but we are happy
to include them as a further tribute
to the work of a man who was for
many years a leading spokesman and
critic of pictorial signing.

**Speculative signing system from
Yugoslavia**

By far the most controversial work
in signing systems in recent years is
that of the Yugoslavian architect

Radomir Vuković. This work
appeared in a publication issued by
the Union of Engineers and
Technicians of Yugoslavia, entitled
'New aspects of informing.'

It was produced in response to this
organization's belief that there was
no adequate visual communication
system for users of the various
transport and traffic systems.

Pictograms with a Japanese accent

Two sets of pictographic signs, both
developed in Japan at different
periods, demonstrate similar
approaches to current international
signing. Yet, in spite of similar
pictorial content, they remain
identifiably Japanese.

And they prompt the question;
'Does picture language have its own
regional dialects?'

A sign alphabet from Otl Aicher

The article describes and illustrates
a new range of signs developed by
Otl Aicher for the firm of ERCO.
In this massive undertaking an
attempt has been made to provide
a wide range of pictographic signs for
many kinds of organizations—schools,
exhibitions, building sites, airports,
etc. The system is modular and
caters for both illuminated and
unilluminated signs, in three basic
sizes and with variations of fixing.

Pictograms with a French accent

Ian McLaren and Claude Braunstein

The authors, who have worked
together for a number of years,
show some of the unified sets of
symbols they have evolved for use
in cartography and on underground
rail signing.

**Design and semiotics: some aspects
concerning the design process**

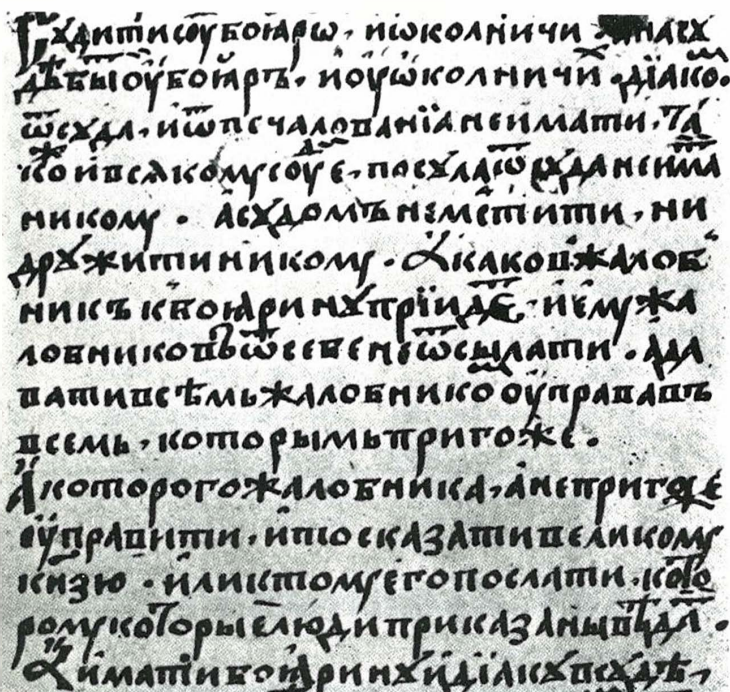
Hanno H J Ehse

The author argues that only when
the designer is willing to accept that
the process which begins with design
can be analysed by exposing the
nature of its structure, only then can
he begin to exert a certain amount
of control upon the effect of his
product and to use it as a precise
medium for the presentation of
visual information.

Tailpiece—danger signs for Europe
Patrick Wallis Burke

The author briefly discusses the
Hazchem scheme, a recently intro-
duced system for the labelling of
potentially dangerous chemicals
that are transported by road.
He is sceptical about the standard
of the pictographic signing used,
which gives little hint as to the real
dangers of such products.

figure 1. Greek uncial, Codex
Sinaiticus
figure 2. Cyrillic bookscript



Cyrillic Gothic: formal modifications to the design of a Russian typeface

Andre Gurtler and Christian Mengelt

Four series for text and display composition were designed for a new Cyrillic sans-serif typeface. Historic and existing Cyrillic typefaces are assessed. Illustrations show the modification of individual characters toward an over-all consistent design of the entire alphabet.

We were commissioned three years ago by Compugraphic Corporation, USA, to design a Russian sans-serif typeface. The assignment involved four series for text and display composition. The typeface was presented in Moscow as a part of Compugraphic's participation at a graphics industry trade fair.

In addition to fixed technical limitations, the request of our client was to propose a typeface whose appearance conformed with conventional Russian typefaces. We initially assessed the existent Russian faces of European type manufacturers. As a point of departure for the design, we were also interested in the development of the Cyrillic alphabet, as well as the abundance of letterforms and their application prevalent in Russia. The result of this investigation was formal changes of the traditional forms of several Russian letterforms. But since we neither read nor write Russian nor are confident in the area of Slavic languages (which proved a handicap during the project), we discussed formal changes with specialists in this area at the Slavic Institute of the University of Basle, as well as with representatives at the Russian Embassy in Switzerland. Our final proposals were approved by both references, and were also fully accepted in professional circles during the exhibit in Moscow.

Through this work and experience, we are of the opinion that further design projects in this area of modern Russian typefaces should be undertaken, especially today when these typefaces are being used by more and more people of different language groups.

The early Cyrillic alphabet (figure 2) stems principally from the nineteenth-century Greek Uncial (figure 1). Of the 43 characters of the Cyrillic alphabet, 24 are exact replicas of Greek forms. To these 24, new characters were then added to represent those sounds belonging specifically to the Slavic languages. These new characters were either combinations or variations of Greek signs, or were borrowed from other alphabets.

During the process of development, the forms of the Cyrillic alphabet acquired different textures as a result of the nature of the pen; some developed rounder and others more angular qualities (figure 3).

As a variation to the early bookscript, a cursive handwriting appeared in the fifteenth century (figure 4). The forms of this variation were connected, and in parts lavishly adorned with snail-like swirls and flourishes. This contemporary hand later influenced certain formal aspects of Russian italic typefaces.

Modern Russian printing type—based on Czar Peter the Great's reformation of early type design at the end of the seventeenth century (figure 5)—is generally speaking, a slight adaption and simplification of the Cyrillic alphabet. Czarist Russia was very much devoted to all aspects of west European culture, and influences of western Europe can be seen in Russia's own cultural expression. Thus, in the year 1708, Czar Peter the Great had his so-called "Civil Type" cast in Amsterdam; at that time Amsterdam was considered the centre of type manufacturing and printing. With this began the influence of the Latin characters on the texture of the Russian alphabet. (See also Ivan L. Kaldor's two-part article, "The Genesis of Russian *Grazhdanskii Shrift* or Civil Type," in the journal *Visible Language*: Part 1, 111 (October 1969), 315-344; Part 11, 1V (Spring 1970), 111-138.)

The Russian typefaces were predominantly produced by west European type foundries (eg, figures 6 and 7). By the formation of these Cyrillic versions of Latin types, those Cyrillic characters that were similar to Latin characters were quite simply replaced by Latin ones, and the remaining characters were more or less adapted to the style of the corresponding Latin type.

The Latin lower-case letterforms especially were mixed together with reduced Cyrillic forms—that is, with original Greek capitals—to form a Russian lower-case alphabet. The result was a mixture of various forms that outwardly exhibited a definite unity of style, but the optical-rhythmic quality of the typeface was usually neglected. This arbitrary adaption of forms, together with the mass of vertical strokes and the angular forms in the Russian alphabet (especially in the lower-case composition of a sans-serif typeface) produced a hard and uneven rhythm. As a result, legibility was impaired.

In the design of our Cyrillic-Gothic (figure 9) we were limited by the client to a conventional version of a Russian sans-serif type, one of the main objectives being to meet the needs of today. We tried, however, to counteract the previously mentioned negative aspects of existing Russian sans-serif faces by making subtle changes in individual forms and by maintaining a conse-

figure 3. Cyrillic bookscript from
Code Tschernorizec of Antioch
figure 4. Early Cyrillic contemporary
hand
figure 5. Peter the Great's Civil Type

ТѢБѢТЪ. НЕХУ
ЖДЕСВОЕГО. ЕЩЕУ
ЖЕБОНДАША. МНО
ГАНШЬШАВЪ
СПРОСАТЬ ОТЬНЕ
ГО. ДАЛЪЖЫНЪОУ
БОГЪТЪ ПАСТЫРЬ
ВЪОУМОМЪН О
КОМЪБЫТИ. ДА
ННЕДННО ПОРОУ
ТЕНЪНХЪМОУ

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ПЕТРОВСКИЙ
ШРИФТ
САНКТ
ПЕТЕРБУРГ
ВЕЛИКИЙ
ПЕТР

figure 6. *Neo-Didot (Russian),
Monotype*
figure 7. *Standard Series Cyrillic,
Berthold*
figure 8. *Section of a page from
the newspaper Isvestia*

шенствованной машин
бретателя Тольбертаж
перфорированной бум
очки шрифта из поло
инженер Джон Селлес

Как рады мы теперь, что ве
на дворе тепло мороз и мет
был известным американск
между прочим изобрёл кали
фон. Что ты это приобрёл это
приобретение. Германские

ИОННОЕ СООБЩ

палат БОЧОИДЗЕ О. С. [Кутаисский избирательный округ, Грузинская ССР], КОЖЕВНИКОВ Е. Ф. [Советский избирательный округ, Бурятская АССР].

9 декабря в Москве продолжала работу вторая сессия Верховного Совета СССР восьмого созыва.

На отдельных заседаниях палат шло обсуждение докладов о Государственном плане развития народного хозяйства СССР на 1971 год, о Государственном бюджете СССР на 1971 год и об исполнении Государственного бюджета СССР за 1969 год.

В 10 часов утра в Кремле в зале заседаний палат Верховного Совета СССР под председательством председателя Совета Союза ШИТИКОВА А. П. состоялось второе заседание СОВЕТА СОЮЗА.

Ввиду избрания депутата Матчанова Н. М. заместителем Председателя Президиума Верховного Совета СССР от Узбекской ССР Совет Союза освободил его от обязанностей заместителя председателя Комиссии по сельскому хозяйству.

А. С. СССР, С содокладом Планово-бюджетной и отраслевых комиссий Совета Союза о Государственном плане

АБВГДЕЖЗИКЛ
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figure 9. Cyrillic-Gothic, roman

Below, sample settings in Cyrillic=
Gothic, in two weights, roman
and italic

Как бы то ни было, но свадьба заняла весь город.
И жених и невеста были предметом общей зависти.
Всем была известна их жаркая, постоянная любовь,
долгие томленья, претерпенные с обеих сторон,
высокие достоинства обоих. Пламенные женщины
начерчивали заранее то райское блаженство,
которым будут наслаждаться молодые супруги.

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figure 10. Cyrillic-Gothic, italic

Below, chart illustrating some of
the variations of form between
early Cyrillic and present-day
handwriting and print practice

v	В	В в	В	в
g	Г	Г г	Г	г
d	Д	Д д	Д	д
ž	Ж	Ж ж	Ж	ж
i	И	И и	И	и
t	Т	Т т	Т	т

original Cyrillic form

handwritten variation

lower-case of printed type

italic variation

quential consistency in the overall design. We show here some different examples of individual form changes.

а р → а р

The Russian lower-case a and r are usually replaced by the Latin forms a and p. We designed them more like their original Greek forms alpha and rho.

ф → ф р у

The Russian f, the only lower-case letter with an ascender and descender, appeared too static. Without ascender the form still remains legible, and becomes more characteristic of lower-case.

В З Э → В З Э

The Russian lower-case v is a reduction of the Latin upper-case B. The form appears too compact because of the small counters. By opening the middle horizontal we achieved a lighter form which has a better formal relationship with other signs.

Б б → Б б

The formulation of the Russian upper- and lower-case B fit together better in our proposal.

л д → л д л д

Our first attempts to change the Russian lower-case l and d were not accepted.

ц ш щ → ц ш щ

By rounding off the left verticals of these forms we achieved a more dynamic rhythm of the composition.

In general, the italic versions of present Russian typefaces were influenced by Russian handwriting and, as a result, certain of these italic forms are completely different from their corresponding upright form. The illustration to the left shows the original Cyrillic forms, Russian handwritten variations, lower-case of a present printing type, and italic variations.

From the beginning we based our italic variation of Cyrillic-Gothic on the forms of the upright alphabet (figure 10). In other words, our italic is simply a slanted version of the upright Cyrillic-Gothic with no relationship to Russian calligraphic forms. In this manner we attained a formal unity between the two versions. This seemed to us to be especially appropriate to a sans=

serif type with its many variations from light to bold, and from expanded to condensed.

Our Cyrillic-Gothic design can hardly be considered a real innovation and not at all a reform, since it had to be directly concerned with current applications. We do feel, however, that we have improved some details of contemporary sans-serif versions of the Russian alphabet, and hope that we have given incentives to type designers of the Slavic languages for further design innovation.

In Argentina recently, as part of the welfare programme, a government housing scheme for low-income groups has been developed.

In consequence, the Urban Housing Bureau saw the need for a signing system that might be applied on a nationwide scale.

It called for tenders from design teams with knowledge of signing. A three-year plan was drafted for the establishment of a sign system capable of fulfilling ten objectives. These objectives might be summarised as follows:

- 1 unambiguous communication in cases of emergency.
- 2 The application of a system appropriate for the control of cars and pedestrians within a traffic network so as to insure the safety of residents a housing complex.
- 3 Establishment of a system giving visual identification appropriate to all users, from housing complexes, apartment buildings, dwellings for individual families, etc.
- 4 Clear signs designating schools, nurseries, health clinics, cultural centres, shopping centres, sports facilities, entertainment facilities, car parks, etc, within the area.
- 5 Establishment of a symbol code that is readily understood by all levels of people living in the area.
- 6 A flexible symbol system capable of being used throughout Argentina.
- 7 A plan that does not contravene the regulations for use of the International Standard symbols.
- 8 Establishment of a system that in form and concept will serve to integrate individual features of a city's planning and architecture.
- 9 Design of rational and economic signs whose production and maintenance will be the minimum.
- 10 The organizational aspects of the system to be explained, regulated and implemented, so as to serve as a given standard.

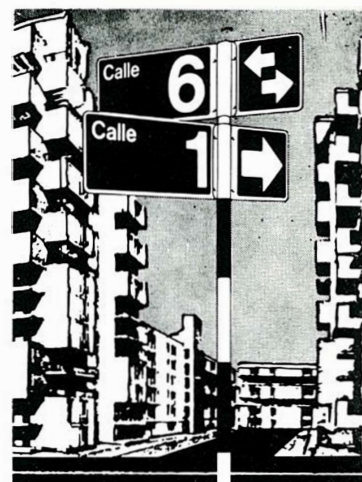
Taking these objectives into consideration, the design team of Guillermo Gonzales Ruiz and Associates, headed by Guillermo Gonzales Ruiz, was chosen to design the signing system.

A feature of their system is that it analysed the areas which are divided by various roads, including the main roads surrounding the housing complex and those around individual housing spaces, categorized the roads and joint spaces for people and cars, and drafted plans appropriate to individual users.

This article was first published in Visible Language, Volume XI, Number 1, Winter 1977, pp 25-36, and we are grateful to its Editor for permission to republish it here. Visible Language is published quarterly (Winter, Spring, Summer and Autumn) by Visible Language, Box 1972 CMA, Cleveland, Ohio, OH 44106, USA



Examples of signs for street names.
Centro Santo Domingo Complex;
Architects, Jaime and Miguel Angel Roca



Example of direction signs for public service facilities attached to the housing complex.
Formosa Urban Complex.
Architects; Bielus, Goldemberg, Wainstein-Krasuk

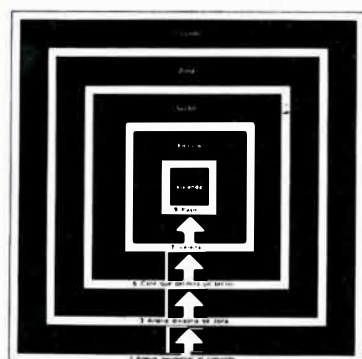


Diagram showing the access route from outside the housing complex to any individual accommodation unit within.
This was seen as comprising ten discrete elements, these being;

- 1 Traffic artery surrounding the housing complex.
- 2 The entire area of the housing complex.
- 3 A zone-dividing artery.
- 4 A zone.
- 5 A section-dividing street or road.
- 6 A section.
- 7 A street.
- 8 A building or tower or block.
- 9 A path or lane.
- 10 An apartment.

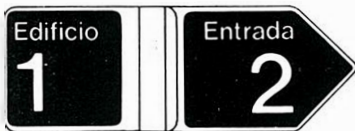
Examples of direction signs for sections, patios, apartment buildings or building clusters.
Matanza Housing Complex.
Architects; Manteola, Petchersky, Sanchez Gomez, Santos, Solsona, Vinoly



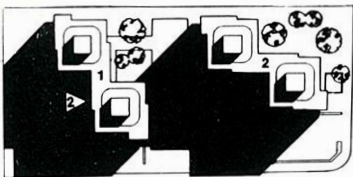


Left, an example of an L-shaped sign at the intersection of two streets.

Right, an example of a location sign in one of the patios, "Patio of the Deer."
Cerro San Bernardo Complex.
Architect; Miguel Angel Roca.



Left, example of location sign for Building No 1 and direction sign for Entrance No 2.
Vicente Lopez Complex.
Architects; Aslan, Ezcurra and Associates.

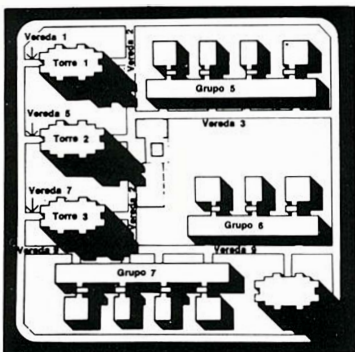


Right, elevations and ground plans of the various types of sign.

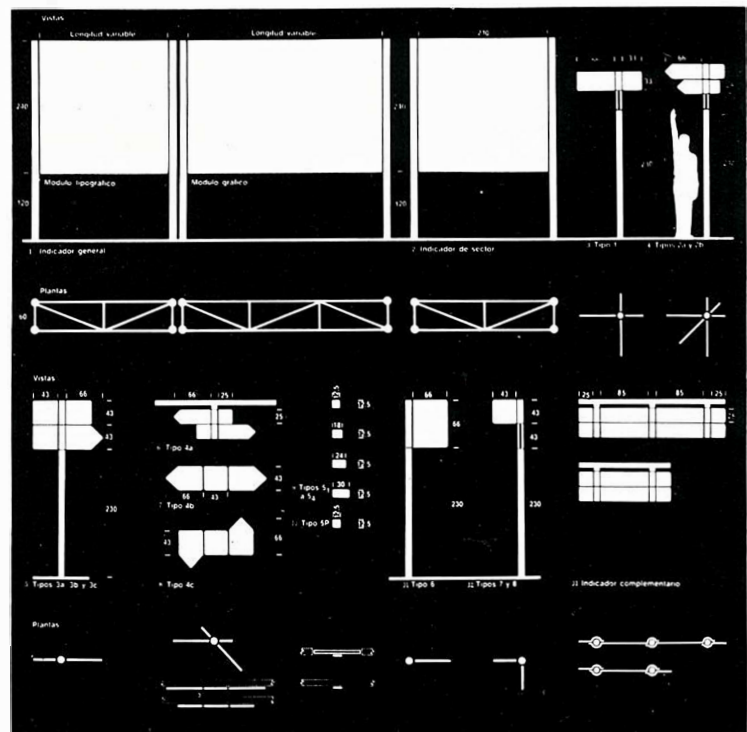
These include signs for street names, direction signs for sections, patios, apartment buildings, public service facilities, location signs for sections, patios and streets, location signs for public transport system, location signs for taxis, location signs for lifts, staircases, and floors within apartments, etc.

Signs are colour coded as follows; in areas for vehicular traffic, red=regulation, yellow=warning, green=street name.

In areas for pedestrians, light green=sections, yellow=streets, orange=building numbers, red=entrance, staircases and lifts, magenta or violet=floors or levels, blue=apartments and services.



Left, Pampa Complex is a part of the housing complex that is not divided into sections. Therefore locations and directional signs take this form.





001
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The scheme makes extensive use of pictorial signs. Many were developed to serve as a means of identifying the various facilities offered by the housing complex—schools, shopping centres, supermarkets, cinemas, etc. In addition, each of the sections, streets, patios or plazas were given identifying names which could be portrayed pictorially. This latter group of signs were developed from three categories;

- 1 products and artefacts of Creole culture.
- 2 Argentinian fauna.
- 3 Argentinian flora.

On the right we show a selection of signs from each of these three groups. The designers adopted a set of graphic rules that would govern the development of these symbols.

- a) The figural element of each symbol would be contained within a square having rounded corners.
- b) Each figure would be conceived, in all cases, as a silhouette and no use would be made of perspective.
- c) The relationship between each figure and its background would be roughly constant, and the relative mass of each symbol would be approximately similar.
- d) In the series representing Creole culture and Argentinian flora, the various figures would be allowed to break out of the enclosing square. In the series on Argentinian fauna, however, each species would be contained within its square.

- e) All symbols would be designed on the basis of a combination of straight lines and curves formed from exact circles or parts of circles.

For all verbal material to accompany the various signs, a special typeface was developed. Entitled *Alborada*, it was an adaption of Neue Haas Grotesk, the lower-case being enlarged in relation to the upper-case and all letters being slightly condensed. Over and above this, the design team also developed various special letterforms, modular tile patterns that could be used for the identification of individual buildings throughout the new town. These various motifs were then painted on to the walls of buildings in either blue or red.

The design team, headed by architect Guillermo Gonzales Ruiz, comprised Gabriel Ezcurra Naon, Maria Solanas, Gustavo Gemini, Susana Gallo, Nicolas Jimenez, Jose Luis Ermler and Gustav Galloni. Consultant engineers were Jorge Jarach and Juan Carlos Gentile. Collaborators in the preliminary study were Norberto Coppola and Carlos Castelli.



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The language of colour

Tom Porter and Byron Mikellides

icographic 12, 1978
Authors' address:
Oxford Polytechnic
Department of Architecture
Headington, Oxford OX30 9BP
England

Signs for facilities within the housing complex

001 commercial centre
002 market
003 supermarket
004 primary school
005 secondary school
006 school of commerce
007 technical college
008 industrial training school

009 nursery
010 playschool
011 kindergarten
012 hospital/health centre
013 bank
014 service station
015 taxi rank
016 bus station

017 basket-ball court
018 bowling green
019 swimming pool
020 football pitch
021 sports centre
022 cinema
023 gymnasium
024 mailbox

Signs to identify patios, plazas, and streets within the housing complex

based upon Argentinian Flora

025 the Ombu
026 the Pehuén
027 the Guayacán
028 the Tuna
029 the Poplar
030 the Tala
031 the Larch
032 the Paraná Pine

based upon artefacts of Creole culture

033 the Guitarr
034 the Stirrup
035 the Lasso
036 the Spur
037 the Mortar and Pestle
038 the Bell
039 the Windmill
040 the Horseshoe

based upon Argentinian Fauna

041 the Puma
042 the Ostrich
043 the Deer
044 the Owl
045 the Fox
046 the Partridge
047 the Llama
048 the Flamingo

Man's evolution of colour vision is intimately linked to the evolution of colour on the surface of the Earth for, in a world without colour, animals would have no use for colour vision.

Before life evolved, the drab landscape of the Earth may have been occasionally relieved by the colour—making phenomena of rainbows, sunsets and volcanic fires; even before colour vision evolved some living tissues were already coloured—blood was 'red' and foliage 'green.' However, the most striking colours of nature, ie, those found in flowers, birds and fish, are all deliberate evolutionary creations which have been selected to act as visual signals which carry colour messages to those who have the eyes equipped to perceive them.

The zoologist Nicholas Humphrey of Cambridge University suggests that the early tree-dwelling primates moved in on an ecological niche previously occupied by birds who could already see colour.

In order to survive through effectively competing with birds, primates needed to evolve colour vision. However, the later emergence of man introduced a new and unique skill—the ability to apply colour where it did not naturally occur.

Probably, he first applied artificial pigments to decorate his body and the walls of his cave and this new-found urge to colour the objects around him eventually became a trademark of the human species.

'Colour anarchy reigns'

When man left his cave and constructed the built environment, colour architecture. In primitive and ancient environments, buildings and statuary were brightly coloured with few man-made forms escaping a coat of applied pigment. Documented accounts of freshly excavated antiquities remark on the intensity of pigment on architectural fragments with sculpture bearing traces of a cosmetic coloration: flesh-tinted bodies with red cheeks and nipples, 'lipstick,' false eyelashes and sometimes, precious stones flashing in carved eye sockets.

The ancient Greek concept of the city was that of a total work of art which embodied the integration of rich colour into the urban design process. Possibly the nearest visual impact to the Ancient Greek expression of built space is the vulgarity of pigment and gilding to be found in a modern fairground. This, together with examples of colour symbolism in the circus, religious ritual, barge painting and surviving folk art, still contains remnants of a colour language, being a direct link with a primitive love of rich colour which can be traced back to the caveman.

The vocabulary of the ancient language of colour comprised of the colours of pigments and metals which individually symbolised specific concepts. Colour meanings were hierarchically assigned to social status, the planets or god deities but its meaning could change from culture to culture much in the same way as colour associations vary today. For example, until recently a red traffic light signalled 'go' in Peking and our Western association of blue with dirty jokes changes to pink in Japan and, again, to yellow in Hong Kong.

Colour use in the design processes of the modern environment is totally arbitrary as we have lost both the knowledge and ability to manipulate either the biological or symbolic colour languages. Humphrey suggests that the former is eroded the moment we give a string of multi-coloured beads to a baby, as he is unwittingly being taught to ignore colour as a signal and, consequently, colour anarchy reigns in the man-made world. Our knowledge of the ancient symbolic colour systems is also gone because, being of inferior quality, environmental pigments suffered the ravages of time. The Renaissance contributed to its decline as colour expertise had moved from the design of environments and into the newly created sphere of the artist who has, since Leonardo, privately investigated its behaviour. Even the colourful revelations accompanying the comparatively recent discoveries of Altamira, Tutankamun, Pompei and Herculaneum, together with colour reconstructions of temples and ziggurats, came much too late to have any real impact on our negative attitude to colour as a meaningful aspect of design.

Humphrey suggests that this present climate of colour chaos, where objects roll off the production line in distinctive but otherwise meaningless colours, that the designer would benefit from a study of natural colour functions. After all, he points out, nature has been in the design business for over a hundred million years. Humphrey claims that our responses to colour still indicate traces of our evolutionary heritage. We still expect colour to carry information and, to some extent, we are emotionally aroused. In some exciting colour preference experiments with rhesus monkeys, Humphrey found that when given the choice they tend to prefer blue to red. In fact, they became considerably upset by red light which prompted a study of this colour as colour experiments with men often show red at the top of an order of preference.

Colour associations

Red seems to have a special signifi-

cance for man because, in the evolution of language, red is without exception, the first colour to enter the vocabulary. It is usually the first word on a child's lips, large areas of red induce psychological arousal, when colour vision is impaired red vision is the most resistant to loss and quickest to recover. Red is also judged as a 'heavy,' 'powerful,' 'active' and 'hot' colour. These and other significant responses point to the fact that man as a species finds red a uniquely impressive colour but sometimes a disturbing one. There are two reasons why red should be chosen by nature to send signals. Firstly, that it contrasts well against green and blue backgrounds and, secondly, it happens to be the colour most readily available to animals for colouring their bodies because, by pure chance, it is the colour of blood. Its ambiguous meaning relies on its context, such as the flush of anger or the blush of pleasure. Red can attract or repel, as in the context of strawberries or toadstools. When red occurs in an unfamiliar context it becomes a highly risky colour as it results in a conflict of instincts in the perceiver.

Some active effects

Speculation and myth surrounding the meanings we associate with colour presents a confusing picture. For example, yellow has been suggested as a good colour for libraries and classrooms as it was thought to stimulate the intellect, but art therapists have observed that suicidally inclined patients tend to use yellow pigment generously in their paintings—as, indeed, did Van Gogh. In another situation, the Institute of Contemporary Art discovered to their cost that the stimulant effect of yellow is so intense that it can incite children to vandalism. During an exhibition of toys, displayed in various coloured rooms, all those in the yellow room were damaged or broken! Antonioni, the film director, made an interesting observation during the making of his first colour film, 'Red Desert.' While shooting industrial scenes on location in a factory, he painted the canteen red in order to invoke a mood required as background to the dialogue. Two weeks later he noticed that the factory workers had become much more aggressive than usual. When filming was completed, the canteen was repainted in a pale green in order to restore peace and so that, as Antonioni commented, 'The workers eyes could have a rest.' Green has traditionally been thought of as a calming colour and on this basis was employed by the last governor of Alcatraz when redecorating the main cell-block and solitary confinement areas. In an attempt to pacify his involuntary guests, all cells were painted green to head height. However, green is also associated with human characteristics, such as envy,

jealousy and suspicion and an explanation for the unpopularity of green ladies underwear points to the eighteenth century when green stains on a petticoat could indicate that their occupant could have been lying in the fields with her lover.

Blue is seen as a 'cool,' lightweight and recessive colour and is less clearly focussed on the eye than the so-called 'warm' colours. This spatial effect has been noted by generations of painters who have understood that different areas of coloured paint can occupy different positions in space. An American researcher has even claimed that the receding nature of blue is demonstrated by the apparent width of a parking space between two cars. The gap between seems wider than it really is and, as a result, he suggests, blue cars suffer from more dented wings than other colours.

If we wish to learn more about our synaesthetic responses to colour, ie, those colour experiences which modify other sensory impressions,

we have to turn to the psychologists. No better way of scanning the research at large is to examine the proposals of the National Aeronautics and Space Administration (NASA) advance research teams to the development of spacecraft interiors. NASA report that, through an interplay of its dimensions and operated along synaesthetic scales, colour can 'reduce' or 'increase' our visual perception of space. It can also modify apparent size and weight of objects, and adjust our experience of room temperature, sound levels and time duration. The NASA diagrams given below, explain their colour application proposals in more detail. NASA's exhaustive programme in the development of extended flight aircraft interiors and extra-terrestrial habitats draws much from the research literature of Kurt Goldstein and Faber Birren. Other proposals recommend the inclusion of pictorial murals, simulated stone and brick textures, plastic rocks and plants which would remind the space traveller of home and Earth.

Meanwhile, some recent research by Lars Sivik of the Psychology Department of the University of Gothenburg, Sweden, challenges some of the common attributes we associate with colours. He claims that most colour experiments are limited by their contextless confinement of the laboratory and, using new techniques in measuring colour judgements, Sivik conducted his experiment directly in the environment.

For his study, Sivik employed the Natural Colour System (NCS) which has been recently developed by Anders Hard, Director of the Swedish Colour Centre as Stockholm.

The NCS acts as a breakaway from other colour notation systems as it essentially relies on our *perception* of colour in the eye and brain rather than the use of scientific measuring instruments or reference to colour samples. Indeed, as a conceptual system based on our subjective experience of colour at a given

moment, the NCS provides a practical tool for research. In its development stage the NCS was tested when plotting the changing colour of foliage viewed from varying distances in space and its subtlety is demonstrated in the tracking of colour-loss in a TV signal between transmitter and receiver.

The importance of the *three* colour dimensions of hue, saturation and brightness are central to Sivik's findings on the meanings we associate with colour. His exhaustive investigations strongly question the proverbial phrase that green colours in general have a calming effect. Furthermore, he found that people do not consider a red to be more active or stimulating than green or, indeed any other hue, if the colours viewed are of equal saturation and brightness. In all his tests he discovered that the dimensions of hue, ie, the greenness, redness, or yellowness of a colour, was much less important on concepts associated with environmental colour than saturation (chromatic strength) or

1 **Brightness, colour saturation and illumination level: effects on the perception of volume**

Volume (Roominess)	Brightness	Colour saturation	Illumination level
Enlarge	Areas will be enlarged by lightness and small patterns (use to alleviate feelings of oppression or being 'closed-in').	Pale or desaturated colours 'recede.' In situations where equipment projects into a room and tends to make it appear smaller than it actually is, paint projections the same colour as the ceiling or wall—a very light shade—to make them appear to recede into wall or ceiling.	High
Close-in	Areas will be closed-in by darkness and large patterns.	Dark or saturated hues 'protrude.'	Low

2 **Colour effects on perception of time, size, weight and volume**

Colour	Perception of time	Size	Weight	Volume
'Warm'	Time is over-estimated; use warm colours for areas where time in apparent 'slow motion' might be more pleasurable (eating, recreation).	Things seem longer and bigger	Weights seem heavier	Decreases apparent size of rooms
'Cool'	Time is under-estimated; use cool colours for areas where routine or monotonous tasks are performed.	Things seem shorter and smaller.	Weights seem lighter. (Use on boxes and containers which must be carried about).	Increases apparent size of rooms.

3 **Interrelationships in living areas**

Colour	Sound	Temperature	Subjective impressions in living areas
'Warm'	Noise induces a hazier perception of warm colours.	'Warmness'—use to soften up chilly or vaulty spaces.	Centrifugal action—with high levels of illumination warm and luminous colours, the person tends to direct attention outwards. There is increased activation in general, alertness, outward orientation. Such an environment is conducive to muscular effort, action and cheerfulness.
'Cool'	Noise increased. Dimness, quietness and sedation of the senses in general are associated with the most active effect of cool colours.	'Coolness'—use where working conditions expose person to warm temperature.	Centripetal action—with softer surroundings, colour hues, and lower levels of illumination, there is less distraction and a person's ability to concentrate on difficult visual and mental tasks is enhanced. Good inward orientation is furthered.

brightness (the whiteness or blackness of a colour). For example, all dark colours (shades) were seen as being more masculine, more unusual and heavier than light colours (tints) and that the shades tend to reduce and clearly define space when judged in comparison with their tinted counterparts. Tints, on the other hand, were judged as being more friendly, more cultured and more pleasant and also rated as appearing more beautiful than the darker shades.

Tentative conclusions

In the context of colour temperature, Sivik's findings support the traditional belief that red appears warm and blue cold except that a blue-red was judged as being visually cool as the blues and the blue-greens. However, Sivik underlines the importance of contextual reference and the interaction of colour and surface texture when posing the following questions. 'Which of the two appear warmer—an ice blue woollen sock or a red plastic bag?'

Sivik's cross-cultural studies in Sweden and Greece suggest that these colour meanings do not vary between Greeks and Swedes and are a step towards establishing the universality of agreement in colour attitudes—at least in the West.

Much work has to be done, however, before we can begin to firmly predict the psycho-physiological effect of colour in the design processes of the future. Investigatory procedures have usually concentrated on single-colour responses because the world of colour combination presents researchers with such difficult terrain. On the other hand, studies which have examined colour attitudes of laymen are conclusive in that people generally are strongly motivated towards richly coloured environments and objects—and to a far higher degree than a so-called 'sophisticated taste' might allow. This fact alone should encourage us towards a more adventurous use of colour in all aspects of design, together with a more dynamic study of the colour experience in programmes which purport to educate the industrial and environmental designers of the future. Above all, a more useful dialogue should be encouraged between the designer and the psychologist as this would connect feedback loops between research and design.



Simple and dramatic graphic symbols designed by Gerd Arntz, under the direction of Otto Neurath. They are taken from *De Delver, Beeldstatistiek*, published in 1935

The idea of using pictograms as a way of expressing complex military, political and economic information is not new. Otto Neurath, however, must surely rate as one of the more important figures in the field of pictorial language.

The work of his *Isotype* group did much to demonstrate the value of pictorial communication and its extreme relevance to present-day communication problems.

As a young man, Rudolf Modley worked as an assistant to Neurath. As a result, he acquired his lifelong interest in what he once called 'world language without words.' From the 1930's to the beginning of the 1940's, Modley directed the work of Pictorial Statistics, Inc, (later renamed the Pictographic Corporation) in New York. Essentially, this was an American wing of the *Isotype* movement.

In our last issue we published a review of Rudolf Modley's last book, *Handbook of pictorial symbols* (Dover Publications, Inc, New York). At that time, we did not have the opportunity to show some of the symbols that were designed during that period. We do so now as a means of paying further tribute to the memory of a kindly man who was for many years the leading spokesman on pictorial signing. Like Neurath, he was convinced of the value of pictographic symbols. Equally, he felt that pictographs were often misused. He once expressed his reservations as follows;

"In sum, there are limitations on the use of pictographic symbols. The best proof of this is that our successful, permanent and universal symbols are almost exclusively 'arbitrary' symbols whose meaning is accepted by convention. This shouldn't keep us from using pictographic symbols where they have clear advantages. It should teach us to be careful in their use."

soldiers,
sailors,
airmen



negroes



women



men



children,
youths



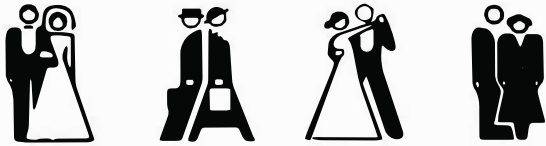
children,
youths,
boy scouts,
sports



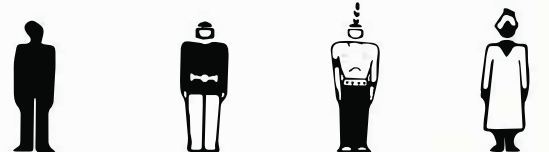
teachers,
students,
education



family
groups



racas,
nationalities,
religions



immigrants
and national
historical types



Speculative international signing system from Yugoslavia

By far the most controversial signing systems of recent years are these by the Yugoslav architect, Radomir Vuković. They first appeared in a publication issued by the Union of Engineers and Technicians of Yugoslavia, entitled 'New aspects of informing.'

They were produced in response to this organization's belief that there was no adequate visual communication system for users of the various transport and traffic systems. Vuković's work was the result of a two year assignment into visual communication systems. It represents his own initiative into the problems and, to be fair to him, it was presented solely to serve as a basis for discussion.

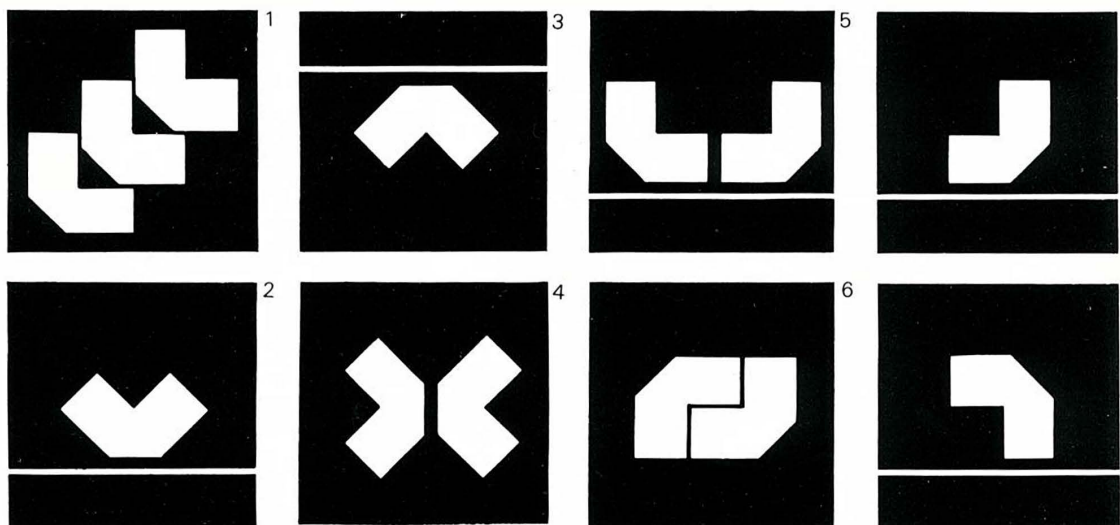
It represents a radical departure from the work of designers like Otl Aicher. It is far less pictorial, much more ideogrammatic—an attempt to jump to higher levels of abstraction. Whether this jump is too great, relying as it does upon systematic learning of each of the signs, readers are left to judge for themselves.

TIN Integral industrial transport

This system deals with the problem of transport and storage, when large industrial concerns need to integrate their transport facilities.

The signs for cranes, forklifts, conveyor belts, storehouses, containers, etc. are represented by a single graphic module.

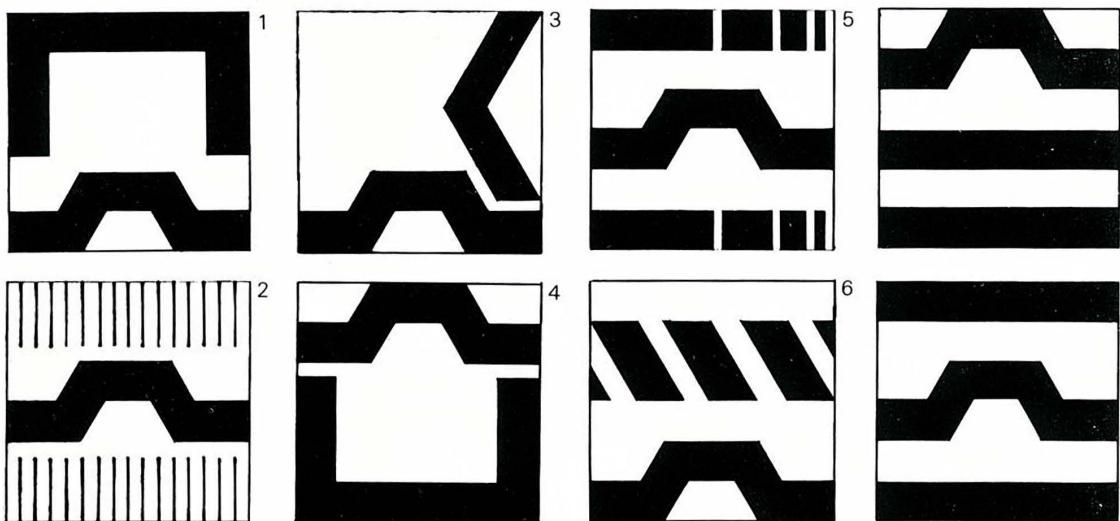
1 shelves, 2 belt, 3 crane, 4 conveyor, 5 box pallet, 6 container, 7 forklift, 8 elevator



P & G Parking lots and garages

The location of, and the directions to, parking and garage facilities are determined by the correlation of basic abstractions of passenger cars and a selection of other graphic elements.

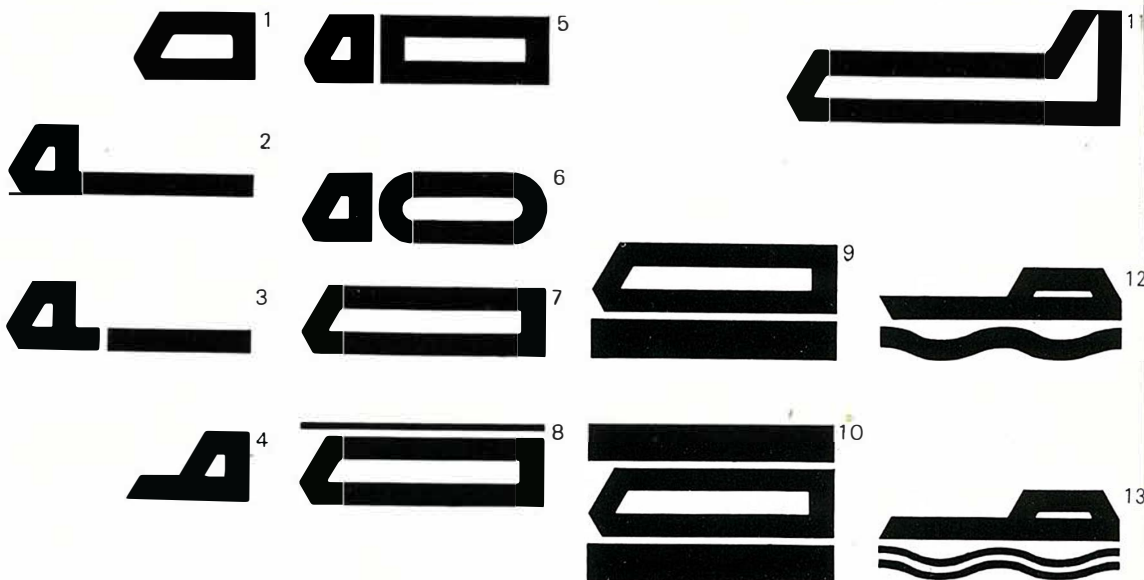
1 garage, 2 carwash, 3 direction, 4 service, 5 parking, 6 exit, 7 roof parking, 8 parking



TEZ Terminal signs

Specific signs for all types of transportation in a variety of terminals are included in this system. Besides signs for mass transit, vehicles in cargo terminals are also represented.

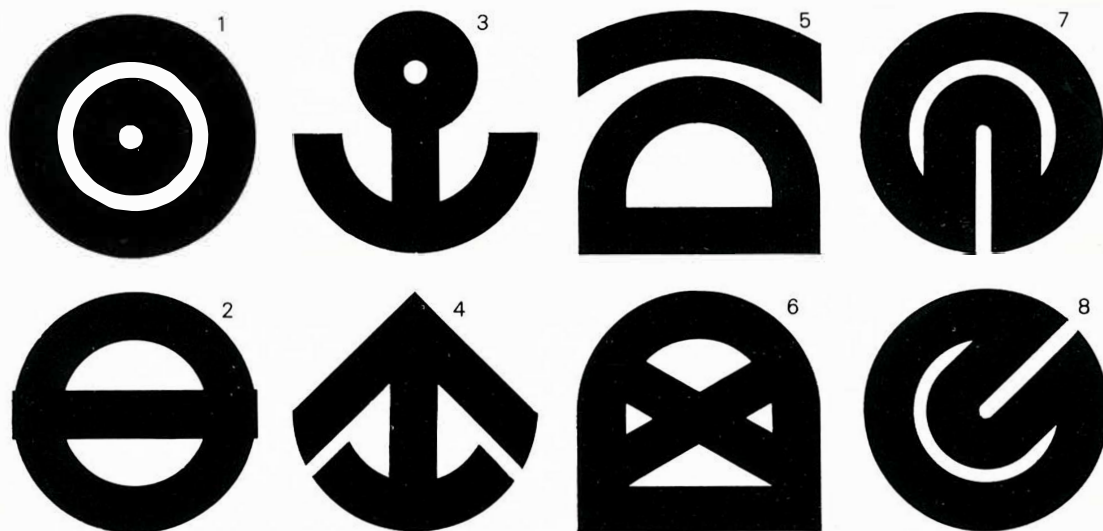
1 articulated vehicle, 2 lorry/truck, 3 lorry/trailer, 4 tractor/motive vehicle, 5 refrigerator unit, 7 bus, 8 trolley bus, 9 tram, 10 underground, 11 aeroplane, 12 ship, 13 hovercraft



MIS International information system

Those locations which foreigners are most commonly directed to are represented in a series of 24 signs. Presented in a unique way as an attempt to overcome the language barrier, the system contains signs for telephone, post office, monuments, public conveniences, information, etc.

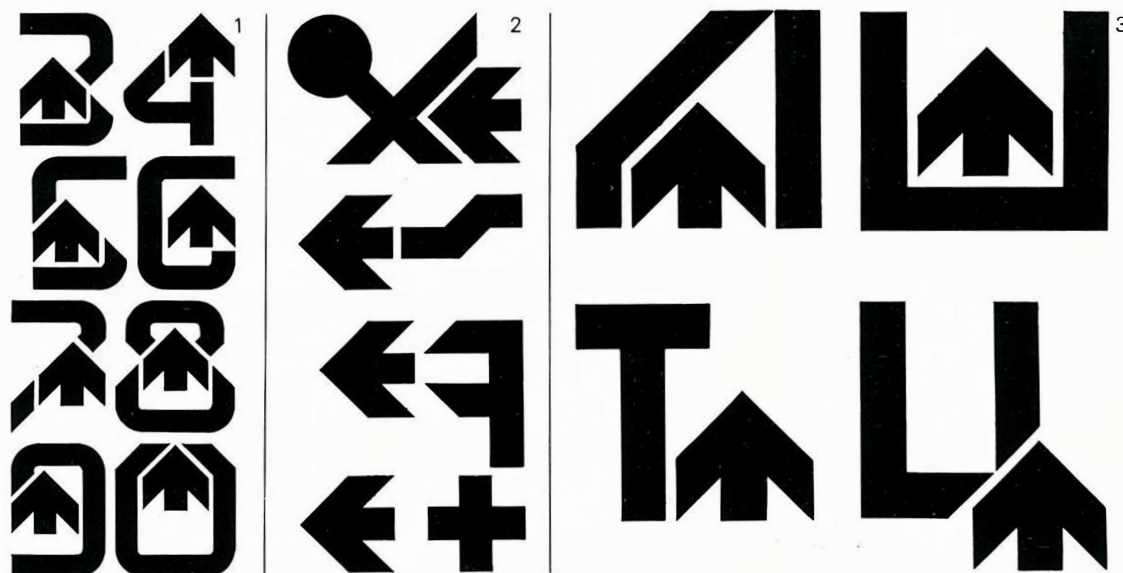
1 bus terminal, 2 rail terminal, 3 water transportation terminal, 4 air terminal, 5 telephone, 6 post office, 7 women's WC, 8 men's WC



UNA Leading and directional

This system is an attempt at solving the problem of direction in an imaginary environment, by a sole element of graphical expression aided by numbers and the Cyrillic alphabet

1 numbers, 2 signs, 3 letters



BEG Belgrade pedestrian zone

This part of the town is represented as a polygon, which offers a new perception to the pedestrian. Contemporary visual taste demanded an overcoming of established methods of communication in this historic centre of the town.

1 Belgrade Central Zone, 2 provisions, 3 garbage collection, 4 parking, 5 garage, 6 entrance to pedestrian zone, 7 theatre, 8 cinema, 9 gallery/museum, 10 fun fair

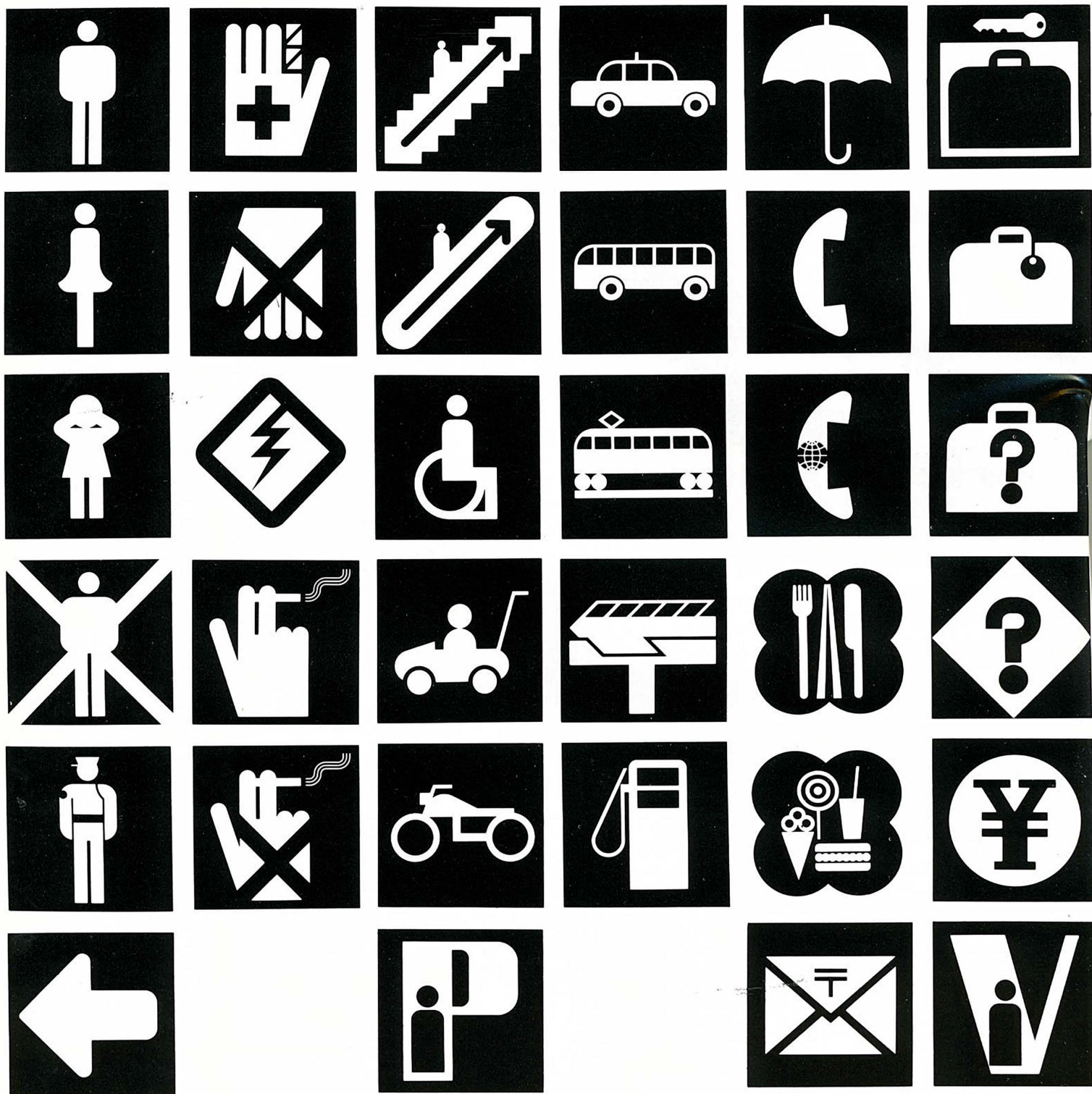


Pictograms with a Japanese accent

Many people, experts and laymen alike, have complained about the haphazard way in which international signing has been allowed to develop. Certainly international signing systems have proliferated, but what is interesting is that designers from all parts of the world seem to have reached similar conclusions. In airport signing, for example, working methods, pictorial ingredients and appearance show great similarities.

Yet one cannot help being struck by stylistic differences. To the international traveller, the image may be familiar, the meaning clear, yet the accent is regional. Is it too fanciful to argue that these symbols somehow look Japanese? And do French signs look French? In other words, does pictorial language have its own regional dialects?

The pictograms on this page were designed for Expo '70 which was held in Osaka during that year. The design team was Ekuan kenji, GK Industrial Design Institute, Isozaki arate, Fukuda shigeo



01 toilet/male
02 toilet/female
03 lost children
04 no admission
05 guard
06 direction arrow

07 first aid post
08 do not touch
09 electrical equip't
10 smoking
11 no smoking

12 stairway
13 escalator
14 handicapped
15 stroller
16 motorcycle
17 entrance/press

18 taxi
19 bus
20 railway
21 monorail
22 filling station

23 umbrella
24 telephone
25 international
26 telephone
27 restaurant
28 shop
28 mail

27 locker
28 cloakroom
29 lost-and-found
30 information
31 exchange
32 entrance/VIP's

A sign alphabet from Otl Aicher

icographic 12, 1978



"In 1920 there were 4 traffic signs, now there are more than 100. Perhaps our civilization might collapse if all signs were changed to verbal explanations. As a result, the design of signs is primarily a socio-cultural matter although, without doubt, there are aesthetic principles to be considered. Graphic designers create a real language—they partake in the development of a new world language."

"It is obvious that our culture and civilization has become so complex that no one language will suffice. In other words, we cannot make do with only one of our senses. We must learn to use sign language not as a substitute, but as a point of entry into our world."

These statements reflect the views of Otl Aicher, and they suggest that the development of a pictorial sign language is not just a present-day whim, especially on the part of graphic designers, but a necessity for the proper functioning of our modern civilization.

The problem represented by the flood of new signs has already been discussed in the pages of *icographic*. A number of writers have criticised the current proliferation of signs. Others have questioned the efficacy of pictures as a *lingua franca*. The International Council of Graphic Design Associations has itself been involved in attempts to rationalize international pictorial signing, and it is currently sponsoring a project to produce test material to contribute to the work of the International Standards Organization's programme on *Graphic symbols for public information*.

Nevertheless, as long as graphic designers go on producing new pictorial signs, it allows us the chance to compare differing approaches.

Certainly, designing a pictogram involves far more than merely drawing a picture. It is a problem-solving process that aims to increase the efficiency of international communication. The picture has to do much more than look attractive, it has to give clear, unambiguous information. Otl Aicher undoubtedly has considerable experience in this area. His work for Lufthansa and, more particularly, for the Munich Olympics, are already well known to most graphic designers. Recently, he was approached by the lighting firm of ERCO. His assignment was to develop a comprehensive, logical system of pictorial signs, capable of being used in a wide variety of situations.

Size and development

The system is modular and caters for both illuminated and unilluminated signs. All signs can be used singly,

or in combination. The signs have been related to an architectural grid. They are square in format and are available in sizes of 300 x 300mm, 450 x 450mm and 600 x 600mm. Via these three sizes it was felt that the system was readily adaptable to most architectural situations. In illuminated units, up to five signs can be accommodated lengthwise. If 300mm signs are selected, for example, a sign unit of 1500mm is possible. Lighting criteria have been developed to cater for various viewing distances and viewing situations (walking, driving, etc). The light boxes are of aluminium, stove enamelled in grey, white or black, into which the pictograms (of plexiglas) can be slid and positioned. All signs are 150mm deep.

Types of application

This pictographic light system is manufactured in series, according to image, and is capable of being wall-mounted or used in the form of hanging signs.

The pictographic sheets are in white, printed in one or two colours, according to image.

Graphic considerations

Type size, type form and viewing distance were taken into consideration in an attempt to give maximum legibility and recognition.

Univers was chosen as the typeface for any accompanying verbal material. Exceptional legibility was achieved by means of a special spacing method devised by Aicher and his team. This spacing method was extended to include the pictograms themselves.

Otl Aicher has this to say about his programme for pictorial signing;

"With the development of advertising signs and corporate identity symbols we have become more and more used to accepting pictures as information carriers.

In our system we have attempted to extend the use of pictographic language as a means of transmitting information. Many signs have now become familiar to international travellers (directional arrows, signs for toilets, prohibitory signs and the like).

Many organizations; transport firms, airlines, exhibition and fair organizers, have already begun to initiate their own pictographic signs.

The Olympic Games in Tokyo and Munich, both made use of a highly comprehensive system of signs and did much to popularise their use. Nowadays, almost every country is beginning to develop its own sign system and we are left with the real possibility of another Tower of Babel situation.

Therefore, we have tried, in collaboration with ERCO, to develop a comprehensive system designed along unit criteria. Because of our work

for the Frankfurt airport and the Olympic Games in Munich, we had already gained much valuable knowledge upon which to build.

In my view the criteria for a good pictogram are as follows:

- 1 It must have iconic character and not be a mere illustration.
- 2 It should be culturally neutral. In other words it must be understood by people from various cultures.
- 3 It should be designed so as to be interpreted by people of differing educational backgrounds.
- 4 It should not offend cultural taboos.
- 5 It must be readable/legible.
- 6 It should be developed according to a grammar akin to that of speech.

The pictograms shown here fulfil these conditions with a few exceptions.

These exceptions were caused when we encountered existing signs for particular functions, as in the case of the sign for 'mail.'

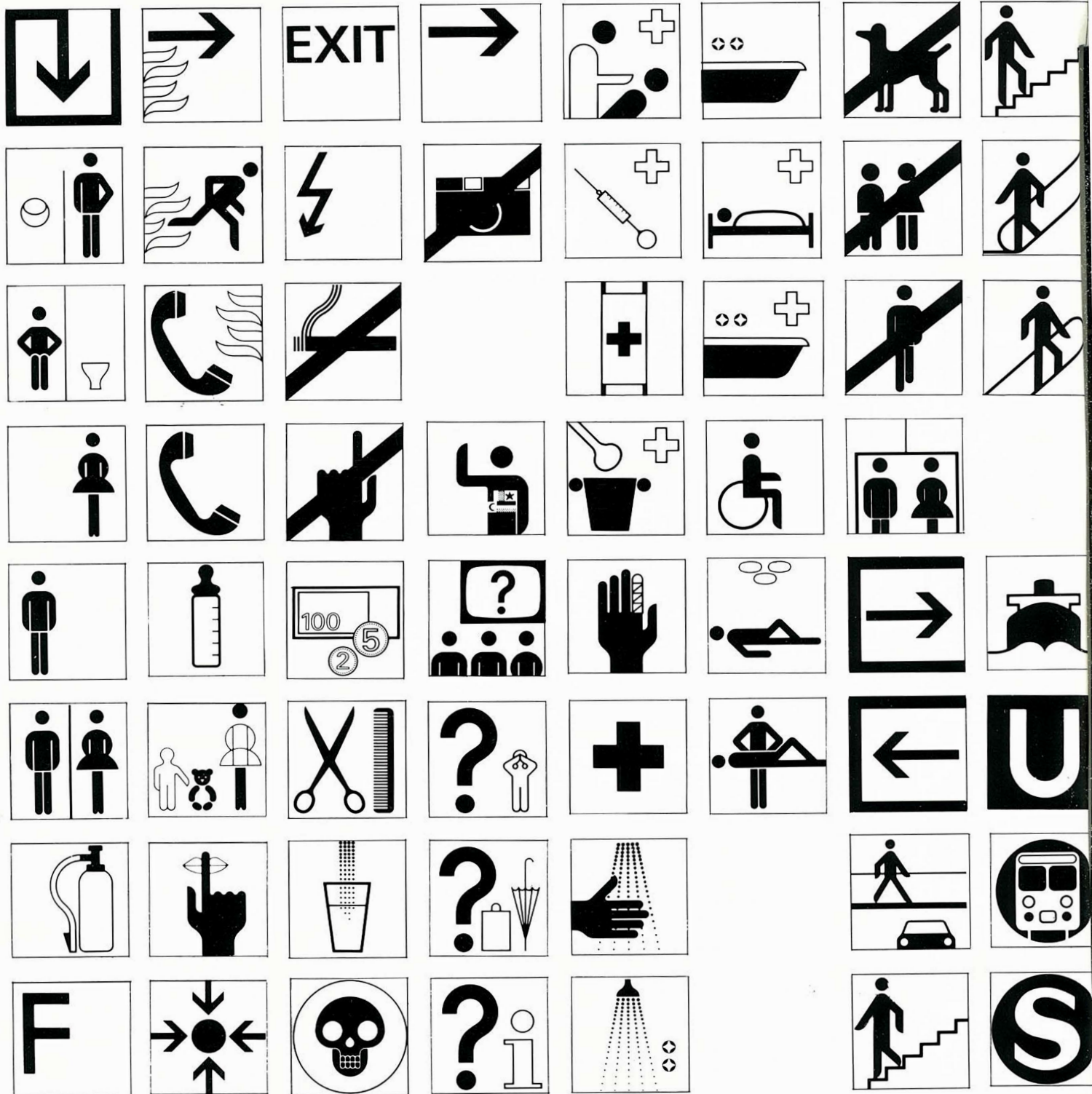
In such cases we have offered an alternative design, thus giving choice to the communication designer.

Other exceptions have occurred through specific cultural demands. Some pictograms require a learning process, or can only be understood in their proper environment. In time, however, as they become more familiar, further abstraction can take place."

Without doubt, the ERCO pictorial signing system is a very ambitious undertaking, but it demonstrates many of the difficulties.

Aicher's Munich Olympic signs were classics of their kind.

Deceptively simple, each sign brilliantly descriptive, yet each image constructed from the same 'kit of parts' so as to give a completely harmonious series. These, with some additions, form part of the new ERCO range. But the additional sign for other activities, such as commercial building, or education, although ingenious, never quite match the brilliance of the earlier Olympic signs. They vary in quality and style, and lack homogeneity as a series. Nevertheless, such a mammoth task deserves attention and respect. On the following pages we show the range of signs that have been developed so far.



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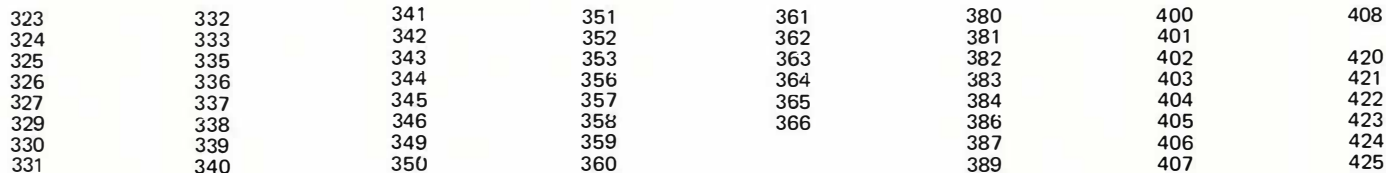
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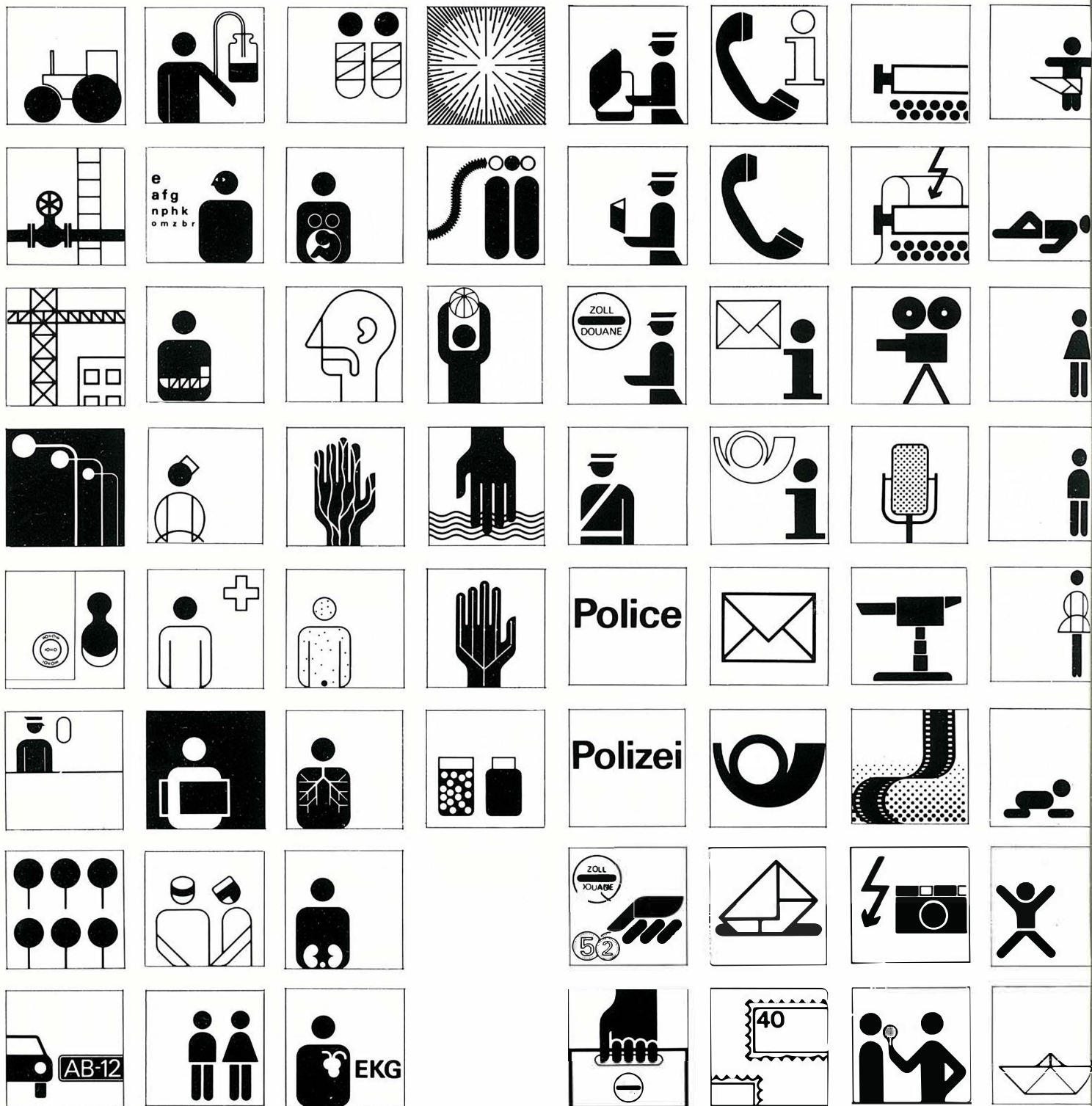
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118	134	142	157	165	181	194	210
119	135	143	158		182	195	211
120	136	144	159	175	183	196	212
121	137	145	160	176		197	213
130	138	146	161	177	190	198	214
131	139	147	162	178	191	199	215

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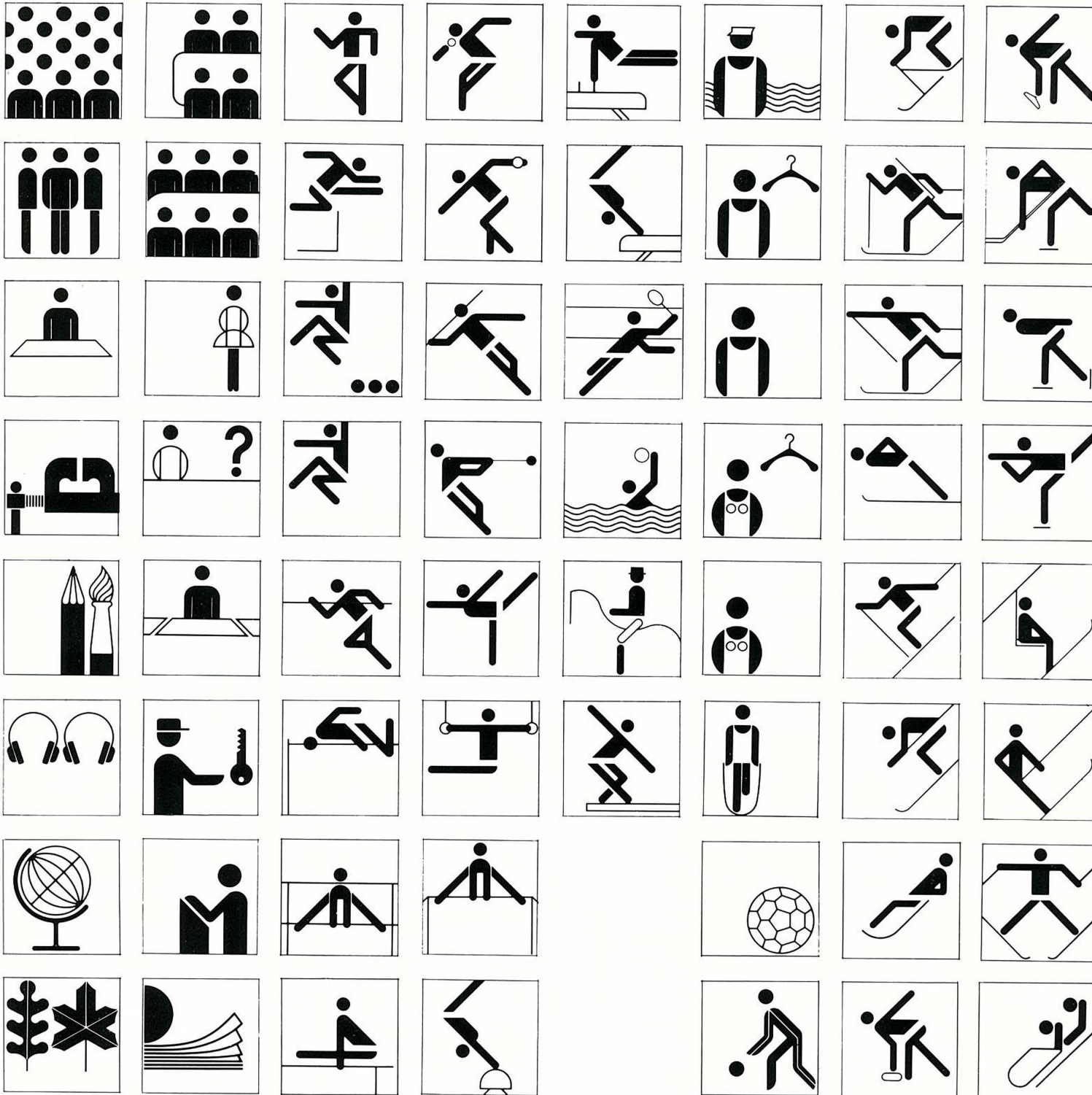
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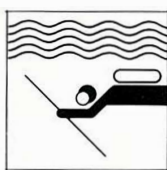
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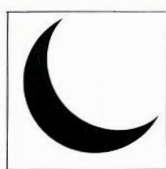
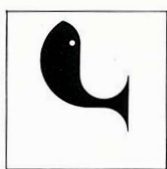
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001 litter
002 urinal
003 water closet
004 toilet/female
005 toilet/male
006 toilet/general
007 fire extinguisher
008 electric fire alarm

132 coin-operated filling pump
133 self-service
134 filling station
135 garage
136 system electronics
137 system diagnosis
138 lifting platform
139 repair



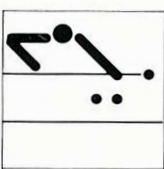
009 emergency exit
010 emergency exit
011 emergency telephone
012 telephone
013 babies room
014 nursery
015 silence please
016 meeting point

140 recovery service
141 rent-a-car
142 headlight adjustment
143 car body repair
144 battery service
145 spark plug service
146 tyre service
147 car accessories



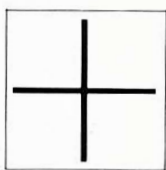
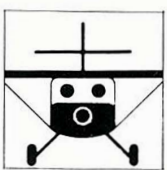
017 exit
018 caution electricity
019 no smoking
020 do not touch
021 bank exchange
022 barber
023 drinking water
024 danger to life

155 transit passengers
156 connection flights
157 helicopters
158 departures
159 arrivals
160 airport
161 duty free shop
162 sightseeing deck



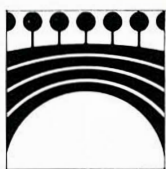
028 arrow/right
030 no photography
050 interpreter
051 EDP information
052 lost children
053 lost property
054 information

163 lounge
164 check-in
165 passengers
175 duty elevator/lift
176 freight
177 baggage claim
178 baggage check-in



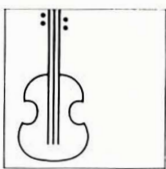
065 dentist
066 vaccination station
067 sanitary officer
068 pharmacy
069 first aid
070 Red Cross
071 washing facility
072 showers

179 baggage room
180 baggage locker
181 porter
182 porter
183 baggage trolley
190 beergarden
191 bar



073 bath
074 hospital
075 medical baths
076 disabled persons
077 solarium
078 massage

192 breakfast
193 coffee bar
194 snack bar
195 restaurant
196 kitchen
197 lunch boxes
198 drinks dispenser
199 food dispenser



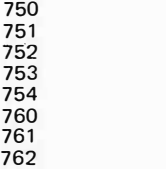
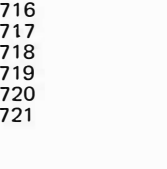
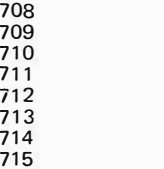
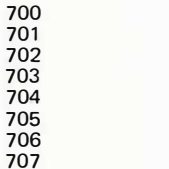
090 no animals
091 children not admitted
092 no throughway
093 elevator/lift
094 exit
095 entrance
096 pedestrian crossing
097 stairs/down

200 self-service
210 cloakroom
211 room service
212 waiter
213 keys
214 reception
215 hotel



098 stairs/up
099 escalator/down
100 escalator/up
111 port
112 subway
113 subway
114 city train

216 dancing
217 discotheque
218 TV room
219 reading room
220 drying room
221 ironing room
222 cinema
223 library



115 city train
116 railway
118 car park
119 taxi
120 bus
121 tram
130 car wash
131 car wash

235 excavations
236 museum
237 open-air museum
238 stadium
241 castle
242 town hall
243 church
244 historical town view

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255	meat industry	341	lighting fittings	479	psychotherapy	646	side horse
256	food industry	342	textiles	480	intensive care unit	647	horse vaulting, men
257	fisheries	343	carpets	481	physiotherapy	648	badminton
258	vine culture	344	furniture	482	hydrotherapy	649	water polo
259	cattle breeding	345	jewelry	483	neurology	650	break-in riding
260	agriculture	346	watches	484	medicine	651	balancing beam
261	paper industry	349	haberdashery				
262	furniture	350	leather goods	495	baggage control	660	life guard
				496	passport control	662	locker room/men
263	wood industry	351	chemist	497	customs	663	sportsmen
264	forestry	352	musical instruments	498	police	664	locker room/women
265	breweries	353	furs	499	police	665	sportswomen
266	soft drinks industry	356	toys	500	police	668	conditioning room
267	leather industry	357	shoemaker	501	customs cashier	669	training field
268	clothing industry	358	tools	502	goods to declare	670	trainer
269	textile industry	359	do-it-yourself				
270	packaging industry	360	garden tools	510	telephone information	680	ski-bob
				511	telephone	681	biathlon
271	publishing company	361	sexshop	512	postal information	682	long-distance running
272	printing industry	362	perfumery	513	postal information	683	special ski-jumping
273	shipbuilding	363	cashier	514	mails	684	station
274	steel industry	364	office	515	post office	685	downhill racing
275	heavy industry	365	dry cleaning	516	mail box	686	toboggan
276	mineral oil industry	366	laundry	518	stamps	687	curling
277	mining industry			525	writing room	688	curling
278	shoe industry	380	suspended loads	526	telex	689	ice-hockey
		381	radioactive	527	film	690	speed skating
279	photographic industry	382	caustic	528	broadcasting	691	figure skating
280	optics industry	383	explosives	529	television	693	chair lift
281	apparatus manufacture	384	inflammable materials	531	film processing	694	t-bar lift
282	precision mechanics	386	wear respirator	532	telescreening	695	skiing instruction
283	machine industry	387	wear ear muffs	533	interview	696	bobsleigh
284	car body construction	389	wear hard hat				
285	cement industry			540	diapers/nappies	700	chess
286	road construction	400	no depositing	541	bedroom	701	bowls
		401	scales	543	girls	702	table tennis
287	electronics industry	402	fork-lift truck	544	boys	703	tennis
288	electronics industry	403	unloading	545	nurse	704	climbing
289	film industry	404	loading	546	scramble room	705	hiking
290	watch, clock and jewelry industry	405	time clock	547	gymnastics room	706	waterskiing
		406	returned goods	548	hobby room	707	trampoline
310	chemical industry	407	ready for dispatch				
311	sports and toys industry			563	auditorium	708	handball
312	musical instrument maker	408	store clerk	564	teacher's room	709	golf course
314	building industry	420	crane	565	headmaster	710	golf course
		421	hydraulics	566	handicrafts room	711	billiards
315	vegetables	422	oil	567	art room	712	gliding
316	fish	423	oxygen	569	language laboratory	713	ballooning
317	sausages	424	compressed air	570	geography room	714	model aircraft flying
318	meat products	425	water	571	biology room	715	boating
319	bakery						
320	foodstuffs	441	road construction	580	talk room	716	skin-diving
321	ice cream	442	civil engineering office	581	conference room	717	fishing
322	delicatessen	443	building surveyor's office	583	hostess	718	hang gliding
		444	public utilities	584	conference information	719	aerobatics
323	snacks	445	office of public works	585	conference management	720	motor aviation
324	drinks	446	doorman	586	caretaker	721	parachuting
325	dairy products	448	landscape office	591	speaker's room		
326	fruit	450	car registration office	587	duplication	750	Buddhism
327	stationery					751	Islam
329	newspapers, periodicals	460	blood donors	630	walking	752	Hinduism
330	flowers	461	ophthalmic ward	631	hurdle race	753	Judaism
331	tobaccos	462	out-patient department	632	hop, skip and jump	754	Christianity
		463	nurse	633	long jump		
332	sweets	464	doctor	634	pole vault	760	open-air stage
333	ladies' shoes	466	X-ray department	635	high-jump	761	concert
335	children's clothing	467	surgery	636	uneven bars	762	theatre
336	women's clothing	468	children's ward	637	parallel bars		
337	men's clothing						
338	gifts	469	babies ward	638	putting the weight		
339	glassware and china	470	prenatal care	639	discus throwing		
340	electrical household articles	471	ear, nose and throat	640	javelin throwing		
		472	circulation, blood, heart	641	hammer throwing		
		474	skin and venereal diseases	642	floor exercises		
		475	pulmonary diseases	643	rings		
		476	urology	644	horizontal bar		
		477	electrocardiogram	645	horse vaulting, women		

Pictograms with a French accent

Ian McLaren and Claude Braunstein

Working together over a number of years, an anglo-french design team comprising Claude Braunstein (product designer) and Ian McLaren (graphic designer), has evolved a unified set of symbols which have been applied to a variety of uses ranging from cartography to architectural signing. They have been assisted at different times by Hans Peter Dubacher, Anne-Marie Latrémolière and Laurence Madrelle.

A series of pictograms devised for cartography of the economic geography of the Lorraine region. The requirement for these was within 3 general classes of information—base industries and energy; secondary industrial processing; recreational and cultural activities. Agency: Mundoprint France. Art direction: Jean-Pierre Grunfeld



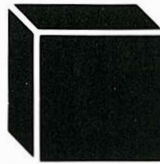
Charbon
Coal
Kohle



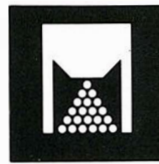
Fer
Iron
Eisen



Sel
Salt
Salz



Pierre
Stone
Stein



Sable
Sand



Forêt
Forest
Wald



Centrale électrique
Electricity
generation
Elektrizitätswerk



Stockage souterrain
de gaz
Underground gas
storage
Unterirdische
Gaslagerung



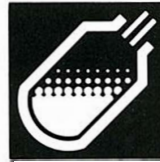
Chimie
Chemicals
Chemikalien



Electronique
Electronics
Elektronik



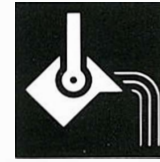
Fabrication de fonte
Iron smelting
Rohstahlherstellung



Fabrication d'acier
Steel processing
Stahlherstellung



Transformation des
métaux
Metal processing
Metallverarbeitung



Fonderie
Foundry
Gießerei



Manutention et
transport
Handling and
transport
Förder und
Transportanlagen



Machines agricoles
Agricultural
machinery
Landwirtschaftliche
Maschinen



Tuyauterie,
robinetterie
Tubes, brass foundry
Röhre, Armaturen



Chaudronnerie
Boilerworks
Kesselbau



Construction
mécanique
Mechanical
engineering
Mechanik



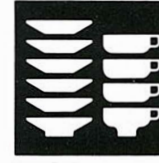
Construction
métallique
Building industry
metalworks



Automobile
Automotive industry
Automobilindustrie



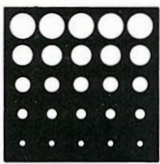
Pneumatique
Tyres
Reifen



Céramique
Ceramics
Keramik



Grain, farine
Grain, flour
Korn, mehl Brenner



Distillerie
Distillery
Brennerei



Brasserie
Brewery
Brauerei



Industrie du lait
Dairy products
Milchprodukte



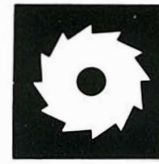
Conserves
Tinned food
Konserven



Textile
Textiles
Textil



Habillement
Garment industry
Bekleidungsindustrie



Scierie
Sawmill
Sägewerk



Fabrication de
meubles en bois
Timber furniture
Holzmöbel



Papier
Paper
Papier



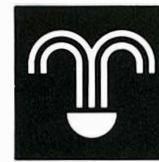
Aéroport
Airport
Flughafen



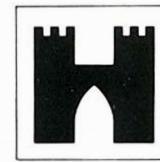
Hôtel
Hotel



Club d'accueil
Touring club
Empfangsclub



Thermes
Spa
Bad



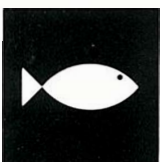
Monument historique
Historical monument
Historisches Monument



Théâtre
Theatre



Musée
Museum



Pêche
Angling
Angeln



Stade
Sports stadium
Sportstadion



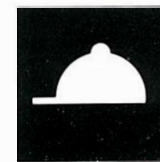
Escalade
Rock climbing
Klettern



Patinoire
Ice skating
Eislaufen



Sports d'hiver
Winter sports
Wintersport



Equitation
Riding
Reiten



Tennis



Aéroclub
Flying club
Flugverein

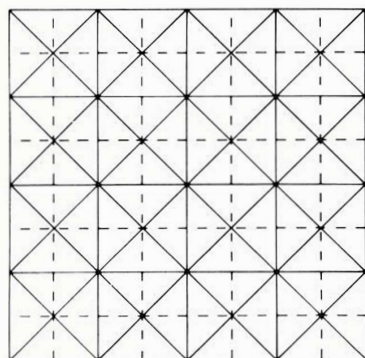
Below, the top three rows show pictograms identifying the principal users and product types of the french equivalent of the Property Services Agency. It is of interest to note that the device of employing different types of uniform limits the application to specific cultural audiences, in this case an exclusively french one.

Below, the bottom three rows show a series of pictograms devised for the signing of the Metro de Lyon. A variety of means of urban transport and related requirements have been catered for. Agency: Omnium d'information Economique. Art direction: Jean-Pierre Grunfeld

icographic 12, 1978
Authors' addresses:
Ian McLaren
36 Pennington Road
Southborough, Tunbridge Wells
Kent, England
Claude Braunstein
5 Place des Reflets
92 400 Courbevoie, La Défense
Paris, France

During the years 1974-75 we have been presented with a wide variety of communication problems, which seemed to require solution by means of a series of related pictograms. All of the signs illustrated here have been designed in response to a particular stated need by different clients. We are publishing the results of these studies now in order to demonstrate:

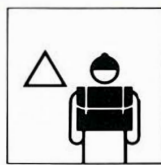
- 1 the flexibility of this method of communication,
- 2 the fact that this variety can be obtained by means of a system which permits overall homogeneity,
- 3 in the hope that this may promote a wider acceptance of these existing signs, thus hopefully obviating further duplication and allowing subsequent efforts to concentrate on the extension of this basic vocabulary.



Collectivités
Local authorities
Behörde



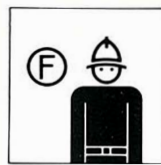
PTT
Post office
Post



Education Nationale
Education
Unterrichtswesen



Armée
Armed forces
Armee



Pompiers
Fire service
Feuerwehr



Police, gendarmerie
Police
Polizei



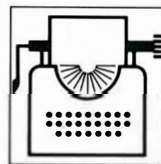
SNCF
Railway
Eisenbahn



Santé publique
National Health
Gesundheitswesen



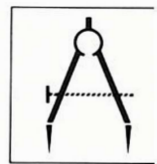
Cantine
Kantine



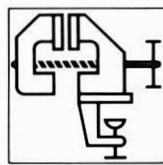
Equipements
mécanographiques
Office equipment
Büromaschinen



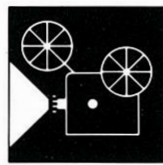
Equipements de
centres de
convalescence
Convalescent
equipment
Rekonvaleszenz-
material



Equipements scolaires
Educational equipme
Schulmaterial



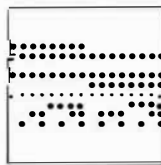
Equipements
techniques
Technical equipment
Technische
Ausrüstungen



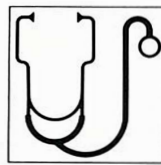
Equipements audio-
visuels
Audiovisual
equipment
Audio-visuelles
Gerät



Equipements mobiliers
Office furniture
Möbel



Equipements
informatiques
Data processing
Datenverarbeitungs-
maschinen



Equipements
hospitaliers
Hospital equipment
Krankenhausmaterial



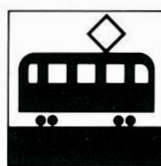
Equipements de
restauration
Culinary equipment
Ausrüstungen für
Restaurations-
betriebe.



Métro
Underground
U-Bahn



Bus



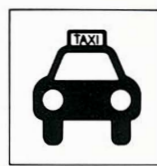
Train
Zug



Trolley bus
Trolley
Strassenbahn



Parking deux roues
Cycle park
Parkplatz für
Zweiräder



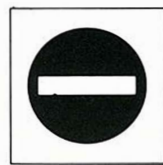
Station de taxis
Taxi stand
Taxi

All of these pictograms are based upon the geometry of the above grid. Only three line thicknesses have been employed. Similarly the number of component elements has been kept to a minimum so as to permit a high degree of interchangeability and substitution of components.

Since 1975 the range has been extended to cover certain aspects of postal communications, marine transport and energy.



Parking autos
Car park
Auto-Parkplatz



Sens interdit
No entry
Einbahnstrasse



Flèche directionnelle
Directional arrow
Richtungspfeil



Non fumeur
No smoking
Rauchen verboten



Alarme
Alarm



Extincteur
Fire extinguisher
Feuer löschter



Local technique
Technical room
Technischer
Wartungsraum



Sortie
Exit
Ausgang



Escalator
Escalator
Rolltreppe



Escalier
Stairs
Treppe

Design and semiotics: some aspects concerning the design process

Hanno H J Ehse

Since 1974 the author has been assistant professor in the Design Division at the Nova Scotia College of Art and Design in Halifax. He was a student at the College of Design in Aachen, studied at Stuttgart University, Ulm and at the SHFBK Braunschweig/Germany

Only when the designer is willing to accept that the process which begins with design can be analysed by exposing the nature of its structure, only then can he begin to exert a certain amount of control upon the effect of his product and to use it as a precise medium for the presentation of visual information.

The sign character of the design object

Many graphic designers still maintain a preference for certain typefaces, colours, layout systems, styles of illustrations, etc, which are valued primarily for their aesthetic qualities judged in terms of personal taste.

This practice of regarding design elements as *autonomous structures* seen in isolation, without considering the ways in which they are linked within the entire social context, can create serious problems. The process of communication design can only be understood if the design is seen in relation to the viewer; the attitudes of the viewer towards the design must be included in this consideration, also the way in which it is processed, emotionally as well as the way in which it is used.

In considering this design-viewer relationship the designed structure is seen as having both an *aesthetic function* and an *informative function*. Furthermore it has, in addition to its physical or *syntactic* appearance, also a *semantic* and *pragmatic* substance by virtue of social conventions.

While it is true that any design may be liked or disliked for its intrinsic values it should be remembered that it also functions as a medium for transmitting messages or information to other people with a definite aim: the design always represents something, means something, refers to or indicates something to someone in a way which goes beyond its physical aesthetic qualities.

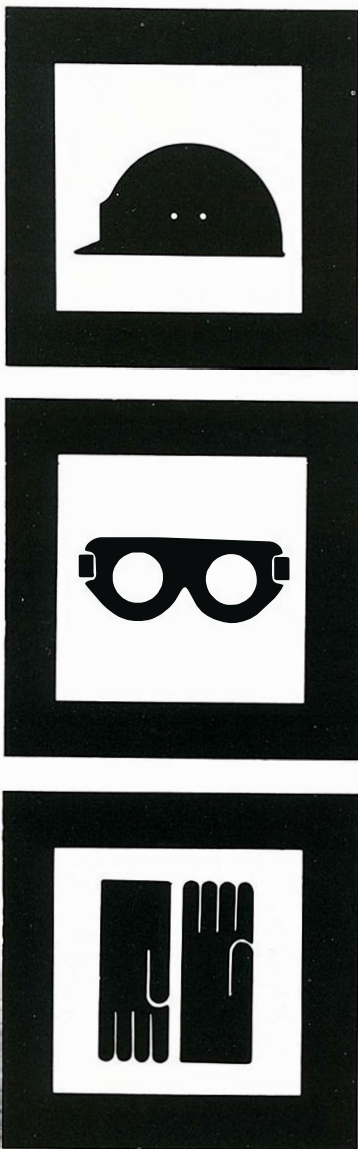


figure 1: Warning signs

If the images shown in figure 1 are seen to represent simply a hard-hat, goggles, and gloves we are dealing with *autonomous formations*, since the images are derived from the objects themselves: the meaning of the images is not clear. In fact, however, they are *pictograms*, used as warning signs; they carry the information "wear hard-hat," "wear goggles," "wear gloves for your protection." This information cannot be understood from the pictograms in themselves, the meaning must be developed by agreement among people; their meaning must be learned. Pictograms cannot have meaning in themselves, only people using them can give them meaning. What the viewer sees is a hard-hat, but what it really means is "for your own protection wear a hard-hat in this area."

The aesthetic and informative functions in communication design are neither exclusive nor clearly distinguishable. In Mukarovsky's terms they are "in constant, mutual contact which can be described as a dialectical antimony."

This means that both functions behave as *thesis* and *antithesis*, both having validity and needing to be seen together.

Moreover, these two functions often come into conflict, competing for attention and consideration, sometimes suggesting different action.

The communication designer cannot afford to consider the aesthetic function in isolation since it is simply a means by which information is presented and not an end in itself: the informative function should always be given priority.

I tried to describe in general terms, that in the case of a design object we are not dealing with an aesthetic or autonomous appearance in the first place, but rather with an informative or indicative one. To speak about an information carrying appearance always implicates acceptance of *signs*, because the principal function of the sign, as Schaff points out, is "to communicate something to someone, to inform someone about something."

What is semiotics?

Semiotics is the doctrine of signs which studies the rules governing their production, transmission and interpretation (from the Greek *semeion* = sign) and has to be seen as a subdiscipline of the general communication theory. It originates from linguistical and philosophical roots and has a tradition which goes far back to the ancient Greeks. Presently semiotics is essentially based on writings by Charles Sanders Peirce and Charles William Morris, both of them well known American philosophers, and Ferdinand de Saussure, a Swiss linguist.

Human communication can be described as transfer and exchange of messages among persons. If somebody wants to communicate, the only way he can do it is by use of some sort of signs, eg, spoken sounds of speech, written or printed letters and numerals, pictures, photographs, diagrams, maps, gestures, and many others. These signs are the essential means which make possible the transfer of thoughts, meanings, and ideas. It follows, that communication between two or more people always constitutes a *sign-situation*.

The basis of such a sign-situation is formed on the one hand by the *sign* itself, and on the other by a so-called *sign-vehicle* (in design mostly paper, in painting mostly canvas).

But what, after all, is the fundamental notion of a sign?

First, it has to be mentioned, that signs are not 'things as they are.' Signs are artificially introduced 'somethings,' they are quasi meta-objects which *stand to somebody for something they signify or refer to*. A sign cannot be said simply to signify something, but only to signify something to somebody.

Thus, the user of the sign is essentially involved. Second, the definition of a sign has to be introduced.

According to Peirce, a sign is *always* a triadic relation, which means it depends on three variables:

a sign exists, if an interpreter I (sign user) adds a mediator M (signifier) to an object O (signified) as a sign.

To illustrate: designer X introduces to the College St Anne the sign;



When the client (sign user) accepts and uses repeatedly the mediator, the shown symbol, it will be associated with the signified object, that is in this case the College St Anne (see figure 2, below).

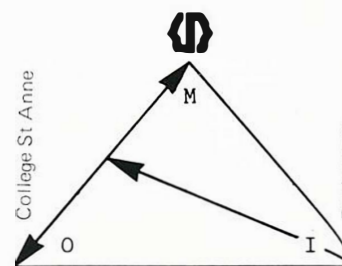


figure 2: Triadic or sign relation

On a different level, every designed object can be analysed as a sign.

It was Morris who proposed a supplementation of Peirce's definition in order to deal step-by-step with problems of signs.

This means, semiotics is studied at three different levels, representing different types of abstracting. These three are not separate, but overlap one another.

Any sign can be studied *first* by its perceivable form; *second* by the manner in which the signified is connected with the signifier (ie, by the relation between form and what is signified by the form); *third* by its use (which includes questions of purpose and desired effects, practical results, and value to sign user and sign producer). In the terminology of semiotics, one talks about *syntactic*, *semantic*,

and pragmatic aspects of signs. All three levels concern signs and regularities or rules.

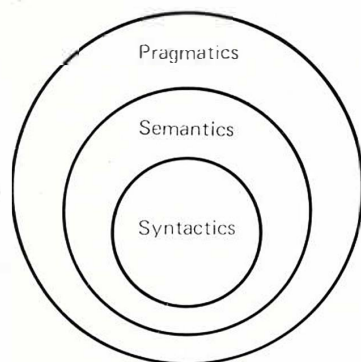


figure 3: Relationship of syntactics, semantics and pragmatics as subdivisions of semiotics according to Morris

Why such a theory?

The question is often asked, "What is design?" This is difficult to answer and points to a weakness in the identification of the process which can be explained, to some extent, by conflict between theory and practice. For design, as is true for any discipline, this question can be answered only by a demarcation from other disciplines by formation of focal points.

Semiotics is an analytical instrument by means of which the design process and its result, the product, can be de-composed or structuralised in order to discover the hidden regularities of the process.

If the design object is a medium, by means of which messages are transferred to a broader public, it carries meaning and intentions.

Semiotics is concerned with the elements bearing meaning and intention in the process of human communication—the signs. As a result, the study of Visual Communication Design is, generally speaking, the study of visual signs and the rules which govern them as means in the communication process. This notion includes practical skills as well as theoretical knowledge. Theory should be a tool in the hands of the practitioner upon which he can base his work, discuss it, and justify it on behalf of his client, his colleagues, and the eventual user.

The design process

Communication, with the goal of achieving a certain effect, requires production as well as consumption activities. When producing a design object, the designer uses signs (letters and figures) which serve as information carriers in the communication process. This activity requires

creation, selection, and arrangement of visual signs in composed and complex sign formations (posters, brochures, identity programmes, etc). If this has to be perceptible and recognizable by the consumer, the designer is not completely free regarding the selection and composition of signs. If the message is to get across, its form is controlled by certain conventions. These can be strong or weak in the way they are codified, and can be more or less unanimous, more or less constraining. For example, if we compare words and photographs, words are codified more strongly, because their meaning varies far less according to different people than a photograph.

The repertory of signs, the designer's tool box of visual elements, has to contain signs which are comprehensible for the consumer, and which belong to the repertory of the user, if the intended and desired effect is to be achieved. In other words, we have to consider the user's part in the process, which consists in previously stored knowledge which he must use to decode the message. This means, if we are to design something which will be understood, certain constraints must be accepted.

When designing or form-giving takes place, the designer does not create out of nothing; he always creates out of a specific repertory which consists of elements and a set of grammatical rules. By rules, I do not mean the grammar which is used in writing, but rather the systems by which text and visual images are arranged in order to communicate which have developed over the past centuries and which are conventional today.

Also, we should not close our eyes to the fact that present-day design is based upon the design of the past. We should make it clear, that we are not simply advocating the adaption of traditional methods but the critical evaluation of those methods, varying them here and there to see whether or not a better fusion between content and form can be achieved. But such gradual changes have to be performed in a controlled and systematized way, not at random, since otherwise they would not be repeatable and the chance of learning by others would not be given.

Let me stress the point by language analogy. A language grows by introducing new words and phrases, but a language consisting only of new words and a new grammar would be gibberish.

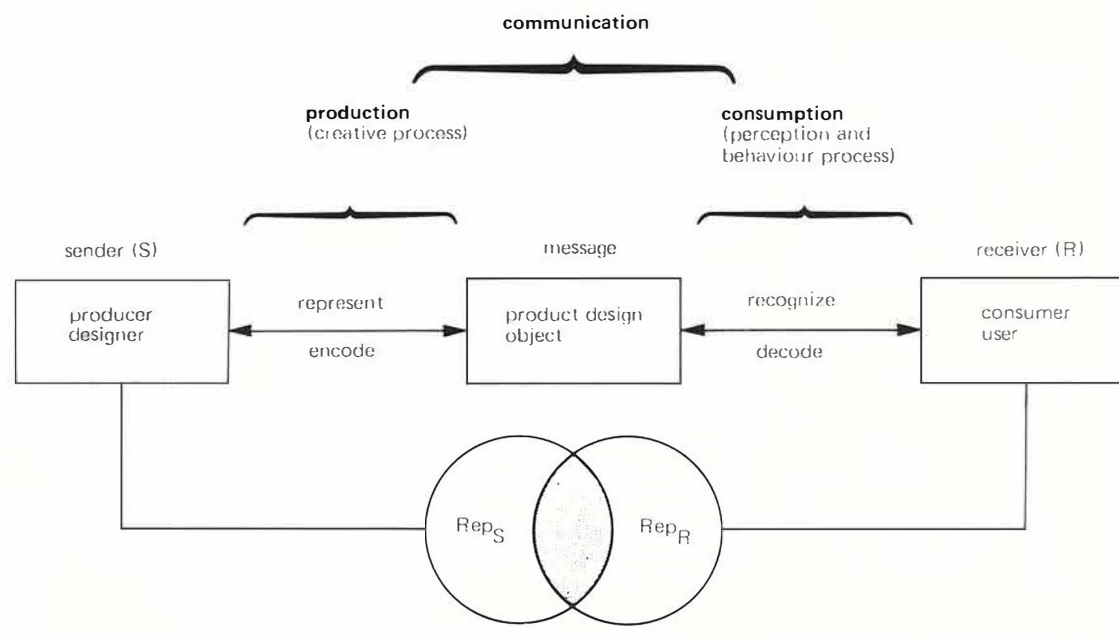
This analogy may serve to illustrate the degree of freedom of choice and the limitation of possibilities available to the designer, if he wishes to change the existing system by introducing new means and concepts of information presentation.

Production depends on consumption, consumption depends on production (figure 4). From the designer's viewpoint, communication also consists in making concessions to the user's knowledge. In design, there is a big difference between concessions made on behalf of formal aesthetic and those made on understanding. If designers are not willing to discuss the validity of their aesthetic formalisms they cannot begin to question the informative function of their designs. The activity of design is dictated by the content, and the

possibility of alternative interpretations by the consumer must always be considered. The consumer's identification with the product must find its counterpart in the producer's identification with the consumer, both have to meet half way. Thus, the design process can be seen as being identical with the general communication process.

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Tailpiece - danger signs for Europe

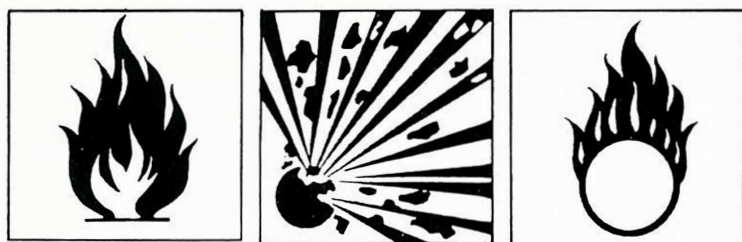
Patrick Wallis Burke



toxic

harmful or irritant

corrosive



highly inflammable

explosive

oxidizing



All over the world now, vast lorries trundle through busy streets carrying potentially lethal loads—inflammable, corrosive, toxic, explosive. Authorities in many countries, alarmed by the risks, have begun to initiate warning systems. Labelling of potentially dangerous products is not new, but labelling does not safeguard against carelessness, nor does it offer much help to illiterates or children not yet able to read.

Recently, a voluntary scheme called *Hazchem* came into operation, covering the transport of hazardous substances by road. At some point it seems to have occurred to the inventors of the scheme that pictures might be used to supplement the technical verbal information. Unfortunately, they did not seem to believe that a skilled graphic designer was needed to bring visual logic to the problem.

Here are six of these symbols, designed to show the dangers offered by various types of chemicals often carried on European roads. Leaving aside the question of why such deadly materials should be allowed on the roads at all, what kind of information do these symbols give? Don't bother to look at the designs in the squares. They are only intended to show the pictorial ingredients. No, in the final scheme, the picture forms only a small part of an informational panel marked on a carrying vehicle. The symbol bit gets squashed up into that lozenge shape on the right hand side, totally dominated by the letters and figures of a code for those in the know—officials, police, firemen and rescue teams. You and I will have to make do with the picture. Maybe you'd like to know what the important-looking letters and numerals mean.

3WE in the *Hazchem* code, means that rescue teams should use chemical foam (3); should wear full protective clothing with breathing apparatus (W); and should consider the possibility of evacuating people from the surrounding area (E). The figure '1831' is not a date, it's the United Nations code for Fuming Sulphuric Acid.

How good do you think that pathetic little drawing is at describing the full horrors of fuming sulphuric acid? In England, on the morning of December 8, 1972, two lorries crashed into each other on the M6 motorway near Wigan, Lancashire in heavy fog. One tanker was ripped open and some 13 tons of fuming sulphuric acid poured on to the road. A 48-year old housewife saw the accident, stopped her car and went back to investigate. Presumably mistaking vapour for fog, she was quickly enveloped in a cloud of sulphuric acid. It was said that it took about two minutes for the unfortunate woman to be literally disintegrated. The pathologist was able only to identify a piece of bone found at the scene as "female."

The *Hazchem* system was not in operation in 1972. But take another look at the information panel and try to decide whether it would have made any difference to the event.

Perhaps picture language is not the real answer to this particular kind of communication problem. But its value certainly won't be properly assessed by half-baked schemes such as this.

errors and omissions

Probing pictures for a lingua franca

There is an error in the text of this article by J B Deręgowski which appeared in our last issue (*icographic 11*). It occurs on page 9, in the paragraph which reads "Responses made by Kenyan observers. . . under the auspices of the South African Medical and Research Foundation. . . " This statement is incorrect. The name of the organization is, in fact, the *African Medical and Research Foundation*. We apologise to them for any embarrassment that this mistake may have occasioned.

First steps on a thousand mile journey—part 2

There is an error in the Chinese text of this article by Patrick Wallis Burke. It occurs on page 18 among the second groups of expressions made up from pairs of 'radicals.'

女士

These two characters were stated to mean an 'educated woman.' The character on the right, however, does not mean 'scholar,' as was intended, it means 'earth,' 'land,' or 'territory.' This pair of characters should really have looked like this;

女士

As you can see they are rather similar and sometimes easy to confuse. Nevertheless, the author apologises to his readers—especially to all educated ladies who can read Chinese

Incidentally, the third part of this article has had to be postponed for this issue. It will continue in *icographic 13*.

Editor

DESIGN ABSTRACTS INTERNATIONAL

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The International Council of Graphic Design Associations was founded in London in April 1963. It is registered in the Netherlands. 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. There are 28 Member Associations in 20 countries and Corresponding Members in 19 other countries. Icograda has consultative status with Unesco and the Council of Europe and full liaison status with several ISO Technical Committees.

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- 2
to improve and expand the contribution of graphic design and visual communication technology towards a greater understanding between people everywhere, and towards a better solution of social, cultural and material problems.
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