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icographic

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Contents include

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On Typos: new Japanese type face Designing and producing a consumers' association magazine

Designing a periodical for a variety of textual needs Type designing in the future Penguin paperbacks Language and readability

Designing for Nuffield Foundation science teaching projects A new Hebrew sans serif for bilingual printing Demise of the point system in sight

atrick Wallis Burke

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Educational technology - the multiplication of tape and the computer's capabilities present new fields of opportunity and a challenge to visual communicators, to their talents and skills, their work and techniques. We send greetings to colleagues with our best wishes for the important video graphic to become an inspiring and rewarding activity to the benefit of communication and education, and thereby improved relations between men

Concern Industrial Design Centre Eindhoven The Netherlands



PHILIPS

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Design for print is one of the principal domains of the graphic designer's work although no longer as predominant as it was a mere fifteen years ago. Alongside the new electro-nic media, for a long time to come, the printed word and image will remain, in the words of F Borden Mace at the VisCom 71 Congress 'the most readily accessible, easily retrievable, economic and efficient means of organising information and of communicating ideas. It requires no support system. It is quite convenient and controllable to have with you on safari or picnic, in a makeshift chair, on a mountain top, a sandy beach and maybe best of all with you in bed.' Traditionally, the field of visually recording graphics for print is well served by a number of national and international graphic design annuals and other periodicals.

In deciding to devote the third issue of its new quarterly to print, lcograda has no intention to compete with these often lavishly and excellently produced publications; nor would we wish to duplicate their work even if our financial resources were not as meagre as to rule out any such attempt.

The specific contribution and viewpoint *icographic* can bring to this subject is that for which the international professional body of graphic designers is uniquely qualified.

The design profession develops against the background of rapid social and technological change. The printing industry is no longer the foremost, let alone the only industry engaged in communicating information. Even the confines of printing in the narrowest sense, the processes employed and the means of production serving them have, during the last generation, changed almost out of all recognition.

These changes in the complex organization of society, in the structure of industry at large, and within the printing industry, bring with them a change in the nature of the tasks confronting designers, and they are reflected in a change of emphasis in the attitudes designers bring to their work.

Due to the by now proverbially fast rate of technological change, and to the uneven development in various countries, our members work within widely differing technological settings. In some of the less advanced older countries and in some of the newly developing countries, traditional printing techniques still predominate. On the other hand, some of the countries only now undergoing the process of thorough industrialisation are setting up new printing and publishing enterprises on the most advanced technological basis. It is in this context, through fostering an informed exchange of views and experience of its members, that lcograda and *icographic* can contribute to our collective advancement.

The most revolutionizing influence on printing technology came from the modern data processing industry and the combined potential of computer applications with photographic techniques. The understanding of thinking and learning processes, too, received great impetus from studies related to computers; recent trends in psychology reveal that influence.

Graphic design in technologically less advanced countries stands to benefit from lively contact with advances in psychology, or information theory, or ergonomics, or the newest tech-niques, as much as an understanding of the problems of our members in small, multilingual countries is likely to assist their colleagues in the most advanced, computer oriented parts of the world in retaining their view of these devices as tools, not masters and their sense of craftsmanship in design. Craftsmanship in design remains important even though it manifests itself, alongside its traditional facets, in new forms such as skills in specifying.

Nothing characterizes better the change in the nature of design tasks referred to above, and the change of emphasis in the designer's own attitudes, than the shift from one-off assignments to coordinated design programmes. Germano Facetti writes of 'reaching a point of professionalism' and of overcoming the arty crafty search for 'the beautiful single achievement' in design for book publishing; but this theme of a disciplined framework of design with a maximum of flexibility is expressed also by John Miles writing about designing a consumers' association magazine, and equally applies to the Dodds' experience as designers for the Nuffield Science Teaching Projects.

The trend from single assignment to coordinated programme reinforces and sharpens the designer's attention to defining the disciplined framework of design. Whether he is engaged on design programmes affecting the visual identity of large corporations, on packaging design or any other major design project, the chances are that he is devising guide lines not only for his own work but to be followed by others in dealing with situations which may not even yet have arisen. The trend from designing the single item to designing coordinated series of items becomes a trend beyond the design of coordinated series to the design of design programmes, the design of systems and procedures by which coordinated, coherent acts of design may be carried out by others. The designer, in other words, charged

A standard specification for print production

Maurice Goldring and Angela Hackelsberger Maurice Goldring and Angela Hackelsberger are in practice as information design consultants (Maurice Goldring Associates, London). Maurice Goldring is chairman of the SIAD/STD Typographers' Computer Working Group

with the responsibility of safeguarding the general rather than the sectional or transient, finds himself becoming the guardian and increasingly the responsible originator of standards.

Collectively, too, graphic designers as a profession are taking their place in the determination of standards. Through two of its commissions, Icograda is recognised by the Inter-national Standards Organization and has liaison status with a number of ISO Technical Committees. Our International Signs and Symbols Commission which has done so much to create conditions in which one can attempt to bring some order into the chaos of uncoordinated sign systems being created by numerous separate agencies, is represented on the new ISO Technical Committee on Signs and Symbols (ISO/TC 145); and through the efforts of the Standardization Commission Icograda achieved that a proposal for millimetric typographic measurement is now before the new ISO Technical Committee on Graphic Technology (ISO/TC 130).

Walter Gropius set himself against an ignorant attitude that 'rejects' standardization. In his view it is one of the immediate prerequisites of civilization. Printing is no more an exception than designing, and again the initiative for so important a development of flexible systems design as that advocated by Maurice Goldring and Angela Hackelsberger must come from professional designers. Our readers will understand why they quote Gropius to introduce their article that urges us to work towards the creation of a standard specification system for print production. The authors and the Icograda Standardization Commission invite critical comments and contributions concerning this important proposal.

Many graphic designers have long agreed that dimensional standardization is an aid, not a hindrance to good design. Some years ago there was lively debate about the discovery of the grid as a design tool. Here, too, the emphasis has begun to change. As designers are forced to become more aware of and more knowledgeable about editorial requirements, about psychology of perception and of learning, their thinking moves from the grid as an element of formal organisation to its logical construction in the light of textual requirements and to the maximum flexibility in its use. This problem of formalistic, as distinct from logically structured print design, appears in print being produced today and it is reflected, too, in design teaching. From one of the colleges orientated towards logical information design, Peter Burnhill reports an example of a project: student editors basing their grid

specification on an analysis of the material to be published.

The Nuffield Teaching Projects are a good example showing the graphic designer as full member of the education team - a far cry from the not too distant days when all educational decisions were made before a designer was even called in.

Graphic designers, whether they are involved in the educational field, in scientific and technical communication or in road signing programmes, whether working on visual identity programmes or designing sets of characters for the most advanced techniques of character generation, are typically working as team members with non-designers. Hermann Zapf states categorically the future belongs to team work Writing about type designing in the future, he stresses the designer's need of an analytical approach, his being obliged, in collaboration with the programmer and the electronics engineer, to work in strictly logical sequence. To what extent systematic methods characterize new type face design programmes is brought out also by revealing contributions from Shin-ichi Seki and Asher Oron.

Significantly, both programmes were conceived as type face families with systematically related variables. Both contributors, too, deal with the problem of compatibility of disparate sets of characters; in the Japanese case, compatibility of the historically distinct Hiragana and Katakana with Kanji, and in the Israeli case comatibility of Hebrew with Roman characters.

Subtle compatibility problems exist too, between typefaces and language characteristics that vary from one language to another. Tibor Szanto discusses how variations in the characteristic frequency distribution of characters, in the incidence of capital letters and ascenders, in characteristic word length, affect the extent to which different typefaces are able to reflect the rhythm of a given language.

The respect designers have for language as well as for the appearance of printed matter should encourage their cooperation with linguistic and with letter form researchers, Whether the dazzling potential of present-day printing technology will level and stamp out of existence the rich subtleties of our diverse cultural heritage or serve to let them flourish more fully than earlier, cruder printing technology permitted, will largely depend on our profession.

From this aspect, as from many others, the more effective use we make of lcograda, the more we strengthen our international association, the stronger can be our hope to bend technology to human ends. Standardization is not an impediment to the development of civilization but, on the contrary, one of its immediate prerequisites. A standard may be defined as that simplified practical exemplar of anything in general use which embodies a fusion of the best of its anterior forms. (Walter Gropius: The New Architecture and the Bauhaus)

Traditional specification practice

Designers, typographers, editors and printers in the technologically advanced countries are becoming aware that the traditional practices of specifying for print are no longer adequate in relation to management and production techniques in the printing industry.

The traditional practice of specifying can best be characterised as informal. The information needed for the production of a job is transmitted using various visual modes, usually in specification notes, letters and memoranda, and in the annotations to authors' copy, designers' layouts and printers' proofs. Such information is also transmitted verbally, perhaps at second hand, as telephone messages.

Information is not transmitted in a comprehensive, coherent form from the outset, but by degrees. This can and does work so far - at a cost - but what are the disadvantages and limitations of this practice of specification as opposed to a more formal approach, such as would be possible by the application of a standard specification system as we will call it, which will be outlined below?

At present, printers meet with unnecessary difficulties and uncertainties in scheduling, planning and co-ordinating their operations, also in estimating their production costs reliably.

Traditional specifications usually have to be assembled and transcribed, and sometimes translated, by someone other than the specifier for use at the various levels of skill and by the various trades involved in the print production process. This represents a potential source of factual error and misinterpretation of the designer's or print buyer's intentions, moreover the duplication of effort incurred is wasteful.

Such specifications do not facilitate consistency of specified information, especially in the event of amendments and alterations. Nor do they facilitate effective and systematic quality control or reference for further use.

One of the most urgent reasons for considering a standard specification system is that the traditional practices of specifying are not compatible with computer applications and with the requirements of the evolving new techniques in printing.

The limitations listed above not only concern designers. All members of the design/production team (author, editor, designer, publisher, printer) are affected by them as well as the manufacturers and suppliers of materials, machinery and equipment.

Proposal for a standard specification system

Let us now consider what a standard specification system is, how it would be applied, what it could offer, and how it could be brought about. We shall then see how the construction industries in two countries benefit from standard specification systems in their field.

A standard specification system for print production would be both a method and a physical object. As a method it is the simplified, rationalised means by which a standard specification for a particular job specification, as we will call it, can be arrived at.

As an object it can be imagined in the form of a handbook, loose-leaf file, card index (possibly edge-punched), or even a computer data bank. It would need to be concise, presenting the information in the verbatim form required: easily accessible, permitting the relevant selections of information to be found rapidly and to be extracted neatly. It has to be flexible, allowing for amendments to be made.

The standard specification system would contain the following main kinds of information: comprehensive descriptive lists of materials, equip-ment and print production processes. It could also contain statements of performance requirements. For example, a printing ink's lightfastness rating, say LF8, or its spirit varnish resistance rating, say SVR5, both maximum ratings (according to British Standard BS 4321: 1969 Methods of Test for Printing Ink) could be seen both as qualities of an existing ink and as performance requirements for an ink that has as yet to be found or to be made up. A maximum permissible tolerance, for example of typographic measure, could also be seen as a performance requirement and be specified as such.

The information contained in the standard specification system should be of high technical quality, presented in concise, clear language. It should be the most comprehensive assemblage of such information available. It should, therefore, list all materials equipment and processes that are in use and all attainable performance requirements.

This information would be presented in the form of standard specification data groups. From these data groups the appropriate items would be selected and be incorporated verbatim into the standard job specification.

The standard specification system would also contain a set of recommendations as to its proper use in assembling a standard job specification, for instance, in what sequence the data items should always be placed, etc.

It is possible that a standard job specification would be assembled in a manner so that each production section (i.e. typesetting, illustration processing, printing, binding, trimming, etc.) could receive its own extracts copied out of the standard job specification document. This master copy could also be agreed to have a contractual function in conjunction, of course, with the layout drawings, artwork, estimate, and production schedule.

A typical sequence out of a standard job specification, which is dealing with the paper to be used and which has been assembled from information contained in the standard specification system, might read as follows:

Туре	Woodfree off-machine coated
Size	SRA1 (640x900mm)
Weight	120g/m ²
Colour	White
Coating	Air-knife, trailing blade
Surface	Super calendered, high gloss, two sided
Sizing	Hard, engine sized
Printing	Letterpress
Cutting	Guillotined four edges
Wrapping	Kraft wrappers

Variables such as the brand name of the paper, its price, quantity required, etc., would also be written into the standard job specification where necessary.

The items given in the example above follow the pattern long established by the British trade journal Paper Facts and Figures which is now generally accepted by paper manufacturers as well as by printers, print buyers and designers as providing a good basis for the presentation of factual, comparable information on paper and boards.

Classification and notation

The standard specification data groups would be classified and notated using an appropriate notation system (possibly alpha-numeric). This would allow the data groups to be arranged systematically for storage, selection and retrieval.

Such a system of notation would provide a shorthand method of specifying where instead of the full data group, only its notation might be given. This would be useful in many ways, to give one illustration: where production in a foreign country under foreign language conditions was involved.

Presupposing that a standard specification system could be agreed, eventually, on an international basis, a job could be specified, say, in the German language version of the system, referred to by notation and produced, say, in Britain using the English language version corresponding to the notation.

This necessary approach of classification and notation should also - and most urgently - have an exemplary effect on the whole field of technical information related to print production, especially on the disparate body of manufacturers' and suppliers' trade literature, and on sample distribution. Trade literature is, of course, competitive in its nature but nevertheless it can become co-operative to the extent of offering itself pre-classified and bearing the appropriate notation. It would also be an advantage if the format of such trade literature could be standardized to the A4 size and be pre-punched for filing.

The user - designer, print buyer, technician - could thus much more effectively shape all the available source material, or have it shaped for his use in a library, into a ready tool of up-to-date reference and learning.

Moreover, the materials, processes and products which competing manufacturers offer in their promotional literature appearing under the same notation would invite and facilitate comparison.

A way to create the system

How could a standard specification system be created and how might it be accomplished at a national level?

In Britain, the first step would be to hold consultations with the representative professional, research and trade associations of the industry to agree the need for such a system, with such bodies as the Institute of Printing, British Federation of Master Printers, PIRA (Research Association for the Paper and Board, Printing and Packaging Industries) Society of Industrial Artists and Designers, and the Society of Typographic Designers.

Having reached agreement both on the need for and the feasibility of a

standard system of specification, the next step would be to define the scope of the research which would need to be undertaken to determine the system's information content, structure, presentation and use. At the same time, the research necessary to create the related classification and notation system would also have to be considered. Thought would have to be given at this stage to what agency should commision the research, who could carry it out and what it would cost. It would then be possible to put forward an application for financing the research to an appropriate funding organization such as the Office for Scientific and Technical Information (OSTI) of the Department of Education and Science.

Once the standard specification system and its related classification and notation system were created, an organization responsible for publishing them and for promoting and supervising their use would need to be set up. This could be an independent organization or, possibly, one integrated into an existing professional association such as the Institute of Printing.

Another Industry's experience

One of the main problems is the complexity and diversity of the printing.and associated industries. How has a comparable though larger industry which has to face a similar challenge started to deal with the need to rationalise its methods of specification?

The Swedish construction industry lead the way with the publication of Bygg-AMA in 1950. This is a general specification of building materials and workmanship which was agreed and adopted throughout the industry. It is recognised in Sweden that it has proved valuable to use a unified general specification and that it has been beneficial to get a common pattern of specification for all trades. Apart from the Swedish Bygg-AMA being the first standard specification for the construction industry to be adopted, it also pioneered the use of the SfB system for the arrangement and coding of its contents.

The SfB system is a method of classification and notation devised for all aspects of building. It uses a series of alphabetical and numerical symbols denoting conceptual groups covered by tables which form the basis of all permutations of the system. The SfB system originated in Sweden after the second world war. Within a few years it spread to other Scandinavian countries and to Britain, where it is now thought to have its widest use. The system is also in use in many other countries throughout the world. Twenty two years after the Swedish initiative in publishing

Bygg-AMA, the British construction industry will in 1972 be adopting its own standard specification system the National Building Specification (NBS). This is being prepared by NBS Ltd, a subsidiary company set up for this purpose in 1969 by the Royal Institute of British Architects. The NBS has the support of the representative organizations of the construction industry. Its aim is to improve the quality of job specifications, making them more consistent, relevant and reliable. Standard specification clauses will be provided which can be incorporated into job specifications. They will be classified and notated using a development of the SfB system - CI/SfB. The NBS will be suitable for both computer and manual applications.

As the construction industries in two countries find that a standard specification system brings many advantages and benefits, the time seems to be appropriate for serious consideration to be given to the creation of such a system in the printing and associated industries.

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On 'Typos': new Japanese type face

Shin-ichi Seki

Shin-ichi Seki is a lecturer at Shizuoka University and a member of the Japanese Society for Science of Desian

Figure 1

Typos 411 was completed in November 1962 as letter-plates for photo typesetting. It is a titling face designed to harmonise with Mincho type and Extra Bold Mincho type of Kanji

No one can deny that letters and their types play an important role as the medium of visual communication. In European countries much attention has been long paid to typography and type faces and various kinds of type faces have been devised. But in Japan few studies, either theoretical or practical, have been made in typography; the number of type faces in Japanese is extremely limited. This is not only because the study of typography made a belated start in Japan; it may also be that the particularity of Japanese letters was an obstacle to its development.

In the Japanese language there are three kinds of letters, Kanji, Hiragana and Katakana, and mixtures of all three are used in Japanese sentences. Kanji, which was imported from China long ago, is quite different from, for example, the English alphabet. Unlike the alphabet, each Kanji has a meaning or more by itself, and is not as a sign simplified enough; it has a complex form. While the alphabet has only twenty-six letters, Kanji amounts to several thousand, even when we restrict them to those used often in our daily life.

Hiragana and *Katakana* were invented in Japan: both were developed from the *Kanji* form. Unlike *Kanji*, they have some quality in common with the alphabet; a *Hiragana* or a *Katakana*, like 'A' or 'B', is indicative of sound but not of any meaning; they are simple in form; their number is limited to 48 letters.

It was *Kanji*, its complexity of form and its vast numbers, that has made it difficult to cast various kinds of type faces. And there have been used only six or seven kinds of type faces in Japan, among which *Mincho* and *Gothic* are most commonly used.

But recently new type faces have been produced in Japan. They are called 'Typos', and are designed by the young Japanese type designers group 'Typo'. Yasaburo Kuwayama, Katsuichi Ito, Katsumi Nagata and Takao Hayashi, are graduates of Musashino Art School. They began to study type design as undergraduates and in 1962 they completed the first new type faces of Hiragana and Katakana, named 'Typos 37 and 411'. These were letter-plates made for photo type setting. In their designs they aimed at those qualities which relate harmoniously with Kanji, for they considered the Mincho form of Kanji and the various forms of Hiragana and Katakana hitherto used were unharmonious.

Although the new type faces were easier to read, there was room for improvement, especially as to the proportions to *Kanji*. Three years later the revised designs appeared, and 'Typos' began to be used far and wide. In 1967 the group completed 'Typos 45 and in 1968 'Typos 35'. Their accomplishments were appreciated in Japanese typographical circles and from 1968 onwards they won various prizes. In 1969 they designed *Gothic* versions of the four new types. These eight kinds of new types are now widely used.

The designers are currently developing new type faces of Kanji and a certain number of these have already been completed. Certainly this is a difficult task, because of the vast number of Kanji characters and also because, as a type face, it almost attains perfection, so that there seems to be little room for improvement. It was for these reasons that they rightly began their work by designing Hiragana and Katakana to harmonise with Kanji. In spite of the difficulties they will, no doubt, create new type faces of Kanji in a few years.

The 'Typos' are faces which answer the demands of the new age of printing, when photo type setting is gaining in importance.

Compared with the older types, 'Typos' of *Hiragana* and *Kafakana* are superior in that they are designed to help the eye to move more smoothly when they are set with *Kanji*. As they are modern, clear-cut and placid, as well as legible, the new types will enjoy wider and wider currency in Japan. They can be expected to survive for a long time.

あいうえおかきくけこ さしすせそたちつてと なにぬねのはひふへほ まみむめもやゆよらり るれろわをんがぎぐけ ござじずぜぞだぢづて どばびぱぴぷぺぽ→?

Figure 4

Module for the composition of characters

The position which each component part of a character takes on the module is indicated by the character in the margin. For example, '∃' (yo): the character appears three times in the right margin. The upper '∃' indicates the position of the upper horizontal stroke, the middle '∃' that of the lower stroke. The '∃' in the top margin indicates the position of the vertical stroke

Figure 5

Elements

In designing the Typos elements, the principle was utmost simplicity and reducation in number. All Kana characters can be composed from the 12 elements illustrated (round stroke, vertical stroke, horizontal stroke, closing stroke, down stroke, circular stroke, turn stroke, up stroke, downkick, stroke, dot, return stroke, locking stroke). In the composition of Kanas, the frequency of these strokes is as follows;

81 horizontal, 66 vertical (including 24 oblique), 34 dot, 46 down, 7 up, 9 closing, 7 downkick, 7 circular, 6 locking, 6 return (including 3 side returning), 21 turn (including 6 left turn and 2 up turn)

Figure 2

Family 1

The numbers at the top left of each square, indicate horizontal and vertical stroke thickness as a percentage of the side of the square. For example, in types 35 the horizontal stroke is 3/100th of the side of the square and the vertical stroke 5/100th. Type faces, such as 23, 45, 67, in which there is little numerical difference between the width of horizontal and vertical strokes, are more of Gothic type: but the greater difference between the numbers the stronger the contrast becomes between verticals and horizontals. Horizontal strokes thicker than vertical strokes would change the image of the characters and such types are not included in the family

Figure 3

Family 2 (modifications)

Headings to each of the five columns read as follows: Square 90° Oblique 1 80° Oblique 2 70° Oblique 3 60° Oblique 4 50°

Elongated 1 (V10xH9) Elongated 2 (V10xH8) Elongated 3 (V10xH7) Elongated 4 (V10xH6) Elongated 5 (V10xH5)

The principle of modification of Typos into elongated or extended type is the same as in photosetting. Horizontal frame 10 against vertical frame 9: extended type 1. 10 against 8: extended type 2. 10 against 7: extended type 3, etc. Vertical frame 10 against horizontal frame 9: elongated type 1, 10 against 8: elongated type 2, etc

Oblique type with a gradient of 10° to the right: oblique type 1, 20° to the right: oblique type 2, etc., and 10° to the left: oblique type -1, etc







5

Designing for Nuffield Foundation science teaching projects

Ivan and Robin Dodd

Cover for one of a series of illustrated text books providing background material on a variety of Chemistry O-level subjects.

They are used by pupils to follow up certain aspects of the course in depth.

The books are two-thirds A4, printed in 2 colours

Symbol for the Nuffield Foundation science teaching projects









	What is an Acid?
1	(EMON)
GROUND CHALK?	JUICE? (BORAX AND)
VINEGA	RT PURE
DA WATER?	WATER?
SODIU	M 2 AMMONIUM
AND WAT	SULPHATE AND WATER?

Dalton and the Atomic Theory

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In 1963 the Nuffield Foundation commissioned us to act as design consultants to the Nuffield Science Teaching Projects.

The publications produced by the members of these projects have sold very widely in this country and abroad. There can be very few secondary schools which do not possess and make use of some part of these materials. In the time between the inception of the project and today, it has become generally accepted that such education projects benefit from the contribution of a designer. The design profession seems at last to want to accept education as a field worthy of its attention.

The object of the projects has been to reform and improve the teaching of science in schools. Practising teachers were seconded from their posts to determine the best way of fulfilling this object. The Foundation put a huge sum of money at their disposal which enabled them to do something hardly known in this country before, to print private editions of their materials and to try them in schools, using the experience of these trials to revise these written materials and to make sure that the reforms they proposed were practicable. The first aim was to engage the interest of the child and one way of doing this was to make sure that he did every experiment himself, except where danger or expense forbade it. Another way was to make the materials as fresh as possible and here we were involved very early. These new ideas demanded new formats and new visual solutions and these had to be hammered out in long discussions between teachers, production teams and us.

As the projects were to be pupil centred, no attempt was made to replace the personal pupil/teacher relationship, with an excess of tech-nological teaching aids. With the teacher retained as the communicator it was decided that the bulk of the material be presented in the form of the book, but not the traditional text book. I quote from chapter 3, page 9 of the O-level Chemistry: Introduction and Guide, In order not to perpetuate a rigid scheme of study, we have avoided any plan based on a single text book. We have in fact, tried to analyse the purpose of a text book and break it down according to its functions. This analysis has given us the Book of Data, Laboratory Investigations, and the Background Books. From the Book of Data the pupil can see if his ideas fit observed facts. From Laboratory Investigations he builds up his own part of the text book. From the background books he forms his own library."



In addition to the books other items (which varied in quantity from project to project), were produced, such as film loops, records, illustrated cards, etc.

As the teams of writers/researchers began to develop their ideas, what had at first sight, seemed a large but fairly tidy problem, became vastly more complicated. An indication of this is the way in which the balance of books varies considerably from science to science and Project to Project.

Apart from the usual points a designer has to consider at this stage of any job, we seemed to have a few extra ones.

1

The nature of the job meant that we not only had to consider The Foundation, writing teams, editorial team and publishers as clients, but also the pupils and teachers who would be using the materials. For example, we had to take into account the age and abilities of the particular group of children a project was intended for. 2

The immense size of the operation and the short time in which it had to be produced.

The limit this put on the number of printers, etc. large enough to handle such a job, and the need to use several.

The resulting restriction this put on availability of type faces, etc.

The formats of the books which were dictated a) by the findings of the writing teams b) by the publishers computerised warehousing.

A vital feature of the projects from our point of view as design consultants was the unusually close contact and discussions we were able to have with the authors of the material. As we began to work with the teams we became aware that the role we played would differ from one team to the other. Through the close cooperation we had with the teams we were able to obtain agreement on certain points which helped the projects to unify visually within themselves.

1

An overall mark for the projects. 2

An overall cover design for each project which worked on the varying formats within that project.

An overall colour code within each project which helped to identify the sciences within that project. In the case of O-level Biology this was carried a stage further so that the *Teachers' Guides* could be easily identified from the *Pupils' books*. As the teams prepared the drafts we went into great detail to find design solutions that would meet the requirements of the wealth of material being produced. Diagrams, etc, specimen pages and in some cases specimen books were produced, revised and in some cases tested in schools to ensure that the solutions were satisfactory.

Earlier we mentioned the intention of the projects to expand the form of the text book. From science to science they evolved in a variety of ways. In many cases the evolutions showed themselves physically, which involved us as designers. In biology (O-level and Advanced) the use of parallel texts for the teachers' guides and pupils' books on a large scale was an introduction new in this country. We had to use our typographic skills to bring this to a satisfactory conclusion. In the Olevel book a second colour was used to show the separation of practical from theoretical text. Advanced Biology used a form of pamphlet 'Topic Reviews'. These, although less ambitious graphically than the Chemistry Background Books, serve a similar function

Chemistry O-level used collections of individual pupil experiments on separate sheets so that the user could integrate his notes and findings and build up his own text book as his studies progressed. Additional background material on a variety of chemistry subjects was prepared in the form of 38 illustrated booklets of two-thirds A4 proportion, in two colours. These are used by the pupils to follow up certain aspects of the course in depth. In planning and designing these, we laid great emphasis on the illustrated material and diagrams. As in other parts of the projects, 2nd colours are used descriptively, rather than decoratively.

Physics O-level teachers' guides make use of symbols in the margins to indicate the various types of text. On our suggestions the apparatus guides were produced using very detailed technical illustrations which aid the assemblage of experiments with the minimum of reference to the text. Pupils' books became simply collections of sequentially numbered questions, to be pondered over and answered by the young physicist. Within the Advanced Physics, a similar form was retained for the pupils' books but the teachers' quides presented a new demand. It was that the text should run parallel with the commentary on the facing pages.

To balance the variations in lengths and importance of the two, it was necessary to set the commentary in a smaller size of type. With the flexibility that film setting allows, we used Univers 7d on 9pt opposite 9pt on 11pt text as it made a better size relationship/contrast, than either the 7pt or 8pt Univers did, when used opposite the 9pt. A further innovation was two volumes for use by both pupils and teachers.

At the present time the Physical Science course is not far enough developed to comment on.

The Combined Science project followed the O-level project and was almost complete before work began on the Advanced Science. The criteria established for this project were even more exacting than the O-level and Advanced Science projects. In addition to the criteria used for the other two projects, it had to:

combine successfully Chemistry, Biology and Physics, 2

make it possible, when the subjects were combined, for the subject specialist to teach the 'other subjects', 3

be suitable for children of widely varying abilities between the ages of about 11 to 13 years,

make it possible for the books to be used in a variety of sequences, so as to be able to take advantage of conditions and seasons as they arise.

This last requirement influenced our designs for the covers of the books and gave rise to the 'decimal clock'. It not only expresses the cyclic shape of the project but is also useful to communicate and draw attention to the relevant book numbers. The exacting brief given to the team provided a great stimulus and it is in the Combined Science project that the greatest departures from the traditional text book have been made. The major innovation was that the students' books, and to a lesser degree the teachers' books, were to be considered as incomplete until the user had added his own notes and findings to the printed portion. To facilitate this the books were designed with wide margins and punched holes to fit standard ring binders. As we worked on a suitable style for the illustrations we were faced with a problem in the childrens' books that we had had no hint of in some parts of the other projects. It was felt that having too sophisticated an illustration style inhibited the pupil and stopped him from attempting his own illustrations. Another point which had to be considered was that within the three sciences there exist certain illustration conventions and requirements that the style should be capable of absorbing. After trials and tests had been conducted a satisfactory solution was achieved

by having the illustrations drawn by an advertising art director, somebody in fact, who uses drawing for communication rather than a form of self-expression. The relationship of pictures and text was carefully controlled throughout the design of the whole series.

Although this article refers mainly to the contributions made by us as designers, this has only been part of a team effort. Authors, schools, committees, publishers, editors, production departments, illustrators artists, printers, all made their contributions

Working on the three Nuffield Science Teaching Projects has been a wonderful opportunity for us to experiment with the introduction into design for education of ideas usually reserved for the more *commercial* types of design.

We detect within the discussion and interest shown in recent years in design for educational purposes by the profession, a tendency to consider it a special discipline, a type of Utopia in fact, in which the designer can at last really contribute something to mankind. Our experience of Nuffield and other projects we are involved with shows this attitude to be far from the truth. We have found that one of our greatest contributions to these projects is our presence in and our knowledge of other worlds.

As the ideas and aims of the education *industry* move towards the worlds that most of us live in, our contribution as a profession can come from our unique position of being one of the few disciplines left today that has avoided, so far, the bugs of over-professionalism and over-specialization.

Double page spread from one of the Chemistry background books. Throughout the projects great emphasis has been laid on illustrations and diagrams, with the second colour being used descriptively, rather than decoratively

Pages from the O-level Physics teachers guides. At the suggestion of the designers, apparatus guides were prepared for teachers using detailed technical illustrations to aid the assemblage of experiments

Covers. for teachers' guides for the Combines Science project. The books are intended to be used in a variety of sequences, so as to be able to take advantage of conditions and seasons as they arise. The 'decimal clock' design attempts to express both the cyclic nature of the project and draw attention to the relevant book numbers

An innovation was that the students' books were to be considered as incomplete until the user had added his own notes and findings to them. It was felt that having too sophisti-cated an illustration style might inhibit the student from making his own illustrations. As a result, the drawings were carried out by an advertising art director, someone who used drawing primarily as a means of communication, rather than as a form of self-expression





2





science teachers'guide II sections



Design education will be the theme of icographic 4, and the same issue will be devoted to the role of the designer in education - a role that is taking shape in various countries and in many forms

On this page we show the cover and

some pages from My Mum, from the Breakthrough' series published by Longman for the Schools Council of Great Britain.

My Mum was written by Pamela Schaub, David Mackay and Brian

Thompson, with illustrations by

The other illustrations are from the

The other illustrations are from the Looking and Seeing and Learning to See series, published by Longman and Van Nostrand Reinhold. These are variations on the theme: here the designer is his own author. Kurt Rowland, who won one of the loograda awards for the best designs for education will contribute an

for education, will contribute an

article to our next issue.

John Dyke.

2



ts the tea for my dad. she looks after the b



2 my mum is big.























Learning **4** to See

Designing a periodical for a variety of textual needs

Peter Burnhill

Peter Burnhill is Head of Design Department at Stafford College of Art and Design. He is a member of the Working Party on Typographic Teaching and a founder member of the SIAD/STD Typographers' Computer Working Group, one of whose study groups he chairs Figure 1. Category 1. Text set to 23 pica ems maximum; references set to 11 pica ems maximum

Type size: a system of dimensional references

Ernest Hoch and Maurice Geldring

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case, morponeers of the terminology used in mage, It was taken as a prime requirement the dd not be tied to any specific phase of printing natance, it should not be restricted to either in he applicable to isoth.

has be applicable to both. It was a further consideration that the step from description to specification should be considered the new of computing devices would allow latins precomputer period. In this coatest, an agree dimension would be necessary for prodication immension would be necessary for prodication system of dimension should form a framework retricted use of only that part applying to red, similario, as well as exercise and further deer dimension and the second red form a framework the system of dimension and further deer the system of the system o

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Figure 3

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A rational approach to designing for a variety of textual needs is being fostered by the growth in acceptance of A4 as a standard size for documents, The key to this approach must lie in the study of the relationship between the inherent structure and use of language on the one hand and that of the structure and use of processing systems on the other.

An example of an attempt to design with this relationship in mind is that of the planning of issue number 2 of the periodical Design Dialogue by its student editor, Roger Davies.

In his editorial. Davies savs. ...we have attempted to provide continuity of reading together with ease of reference for a wide variety of articles... The papers seem to fall into three main categories:

1

texts with occasional diagrams or textual reference, or both; 2

comparatively short pieces of text interspersed with diagrams; 3

texts with neither of these items".

Davies then lists some of the decisions he made for the dimensional co-ordination of parts relative to these major subsets of the total problem. An example of the result of his thinking about each category, and of the relationship between each, is illustrated in Figures 1, 2 and 3 respectively.

A full specification is not possible here, but some of the items which are applicable to all cases are:

Binding: loose leaf with plastic slide. Binding (filing) margins: 12 pica ems. Information area: horizontal, 35 pica ems maximum. vertical, 66 lines maximum. Line feed: (baseline to baseline), 12pts. Type: face and size: Monotype Baskerville 169, 10 on 12pt. Line space: multiples of 12pts; no vertical justification. Word space: 5 units of set throughout; no word breaks, no hyphenation. Diagrams, photographs, etc: vertical, in units of line feed; horizontal, free up to 35 ems max. Captions: as text, but in parenthesis.

Comment from readers on these decisions would be helpful and appreciated. Write to Roger Davies LSIA, Design Department, Stafford College of Art and Design, The Oval, Stafford, England.

Press (Halos) Spain (4) 1. Solid at taking of the out Halos

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Figure 2, Category 2 Text set to 35 pica ems maximum

The drawing of the final lower case roman alphabet

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Design in communication

Dr L Bowcock me ceb aimbt frsa

lie Bow cocks the Director of the Department of Medical Ubustration he North Stafford-thre Hospital Centre and it also Chairman of the Lest its diral and Biological Illasiration

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Penguin paperbacks

Germano Facetti

Germano Facetti is a member of Alliance Graphique Intenationale. As art director of Penguin Books Limited he was responsible for the well-known Penguin restyling programme

It is debatable whether book publishers should or should not have a corporate identity. On one hand, the corporate imprint is in itself a guarantee of the publisher's quality. The success of Penguin Books should dispel any doubts about the desirability of a coherent design approach, ranging from the logotype right down to the last piece of mail order stationery. On the other hand there is the widespread belief that books should receive 'individual' treatment, compete visually with one another, promote the author today and the title tomorrow, accepting 'conventional' marketing techniques. Penguin books was a meaningful exception to this belief because it consistently proved that a flexible identity was an asset. It is therefore possible to assume that an indispensible factor in evaluating design choices for book publishing is a disciplined framework of design with a maximum of flexibility. This is *not* to be interpreted as providing an escape for an eclectic or decorative whim, however necessary that may be for some books, but as a method which to a degree reflects the corporate identity of the publisher.

The distinction between Design and Art is found here at a peculiar crossroad. It is in their interpenetration and interdependence that the solution of the contradictory wish 'to have a common identity yet to be individuals' lies, if the 'design' be immune from local and provincial fluctuations of fashion, yet still able to contain and integrate any art technique. Only then would a symbolic, decorative, diagrammatic or documentary approach be annexed, but with a common communication factor. Not all the covers shown here are thrilling from the point of view of design. It is much more important that Penguin has established a high standard throughout, rather than swinging from very good to very bad, cover to cover, as almost all other publishers do. Such efforts on the part of publishers demonstrate that for them at least graphics is reaching a point of professionalism, and is over coming the arty-crafty approach of the single beautiful achievement. This is not to advocate that a thousand mediocre covers are better than one good one, but to emphasise that striving for an over-all high standard is worth the sacrifice of the ivory tower.

In 1961 the restyling of Penguin Books had to deal with an established image in facing the problems of transition from the 'typographic' to the 'visual'.

In designing for classics, it was assumed that the majority of great works of literature have inspired works of art, or that works of art have been created with a bearing to literature. Besides the obvious 'desirability factors', the provision of a visual frame of reference to the work of literature can be an additional service to the reader who is without immediate access to art galleries or museums.

The Penguin Modern Classics are a parallel to the Classics. The transition from the typographic grid of the first cover displays a withdrawal from the typeface scarcely apt for incisive display, in favour of Helvetica, to create a more integrated relationship between type and image.

The Penguin English Library marks another variation of the typographic grid for the Classics. A corporate identity seems desirable to underline the unity of editorial approach and the marketing requirements. The selection of details of paintings is in every case an exercise of fitness and impact balanced against adequate readability and publisher's identity.

The transition from typographical to graphic design is reflected in the collection of *Penguin Plays*, where colour variations in horizontal bands and a special logotype establish a recognition factor for a reliable series of texts.

Penguin Fiction and Crime used artists like Andre Francois, Milton Glaser, Peter Blake, William Roberts, etc., and photographers and designers to interpret the mood of modern novels. The graphic design is sometimes varied, yet retains the orange or green key colours necessary for identification.

Penguin reference books and dictionaries show that the early design was timid and lacked impact. It was in need of sharp focussing both on the subject and on the house image.

The *Penguin African Library* is another variation within a graphic discipline. The brown fascia at the top of the book cover identifies the series and the bottom part identifies the book.

The Penguin science and technological surveys do not need series identification since they are published once a year, superseding the volumes of the previous year.

The *Penguin Specials* are topical pamphlets covering contemporary problems. Their design has to reflect impact points and familiar features within a Penguin framework.

Penguin Handbooks cover a field as wide as from Cookery to Chess. The design balances between the 'descriptive need' and the guarantee of Penguin's imprint.

Penguin Parallel Texts reproduce

French, Italian, Russian and Spanish novels, with the original text facing the translation. *Penguin Associated Television Series* contains the dialogues of famous television language programmes.

Penguin Poetry evolved to the present wrap-around image. The evocative function of the painting reinforces the discreet Helvetica titling.

Pelican Books are the layman's nonacademic University. They are designed to interpret the content of the book by 'complementing' the title with interpretations that range from the symbolic to the diaarammatic.

Peregrine Books are a series of critical essays. They are part of the Penguin family, distinguishable by their format and different typographical treatment.



PENGUI

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Fatal Venture

Freeman Wills Crofts

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- 15 Stephen Russ
- 16 Bruce Robertson
- 17 Massimo Vignelli
- 18 Germano Facetti/Paul Gori
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- 21 Bruce Robertson
- 22 Germano Facetti

Penguin Fiction and Crime

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Penguin Plays

Penguin Modern Classics

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Designing and producing a consumers' association magazine

John Miles

John Miles, a partner in Banks and Miles, London, discusses experiences with one of the periodicals for which their practice is responsible

The notion of technical and logistical considerations limiting the designer is commonplace, but to what extent does editorial policy influence design and how far should the designer try to resist and remould editorial attitudes?

Which? the magazine - and the main public face - of Britain's Consumers' Association presents an interesting case of technical, logistical and editorial limitations interacting upon each other.

The Consumers' Association is a nonprofit making organization which depends for its income entirely on subscriptions to the monthly magazine and its three satellites, *Motoring Which? Money Which?* and more recently, *Handyman Which?* There is a monthly run of about 600,000 of 32 pages of basic magazine in black and one colour plus 40 pages of one of the satellites. Delivery is always by direct mail; it cannot be bought at bookstalls. It carries no advertisements other than notices of the Association's publications.

The editorial concept of the magazine is one that has changed only very gradually over the dozen or so years that Which? has been in existence. The original motives for the organization itself will one day probably make a PhD thesis in social studies, but it was clearly imbued with the English 'puritanical conscience' and left wing resistance to laissez-faire commerce in the fifties. There are no doubt many who do not have an immediate need for the magazine itself but who still subscribe on the grounds that such an organization is worth supporting. There will be a few who would feel that the publication might just as well be a typewritten, iduplicated sheet, but clearly as Which? has become an established institution, exposed to the pressures of the market place as any other publication, more sophisticated techniques of presentation have become, not only desirable, but a matter of survival.

The editors and writers are usually successful and highly articulate graduates trained in the literate but, for the most part, visually superficial techniques of the universities. The designer's problem is, therefore, to persuade his editors' of the need to apply certain design principles to the presentation of material. For this purpose the "I'm the designer and I like it" is insufficient; reasons outside aethetics or taste will have to be advanced if major improvements like unjustified setting ('it looks like blank verse!') are to be introduced.

So, at this point, the designer finds himself slipping unexpectedly into the other crafts of diplomacy. But nothing will be achieved unless it is recognised that the object is not to satisfy the designer's vanity, but to get the information over to the readers within the editorial concept, while pushing all the time for the design modifications which are essential to the progress and life of the magazine.

In considering the design problems of such a publication, the designer finds that he cannot limit his thinking only to visual images; for although it is these images that the reader sees, the total problem of the whole product must be included in the design ideas.

For instance, 600,000 simultaneous direct mailings means not only half a million wrappers, but as many postal charges. So the weight of the paper must be such that the magazine does not exceed the maximum weight for the minimum postal rate, otherwise the postage costs could jump by as much as £30,000 per year. Considerable trouble has been taken to produce a paper that is tough enough to run through the web, opaque enough to minimise showthrough and with a surface good enough to give a decent halftone result.

Web offset implies certain limitations which are frequently pushed to the limits by the good quality achieved by the printers (Hazells Offset). Nevertheless, too many big solids have to be avoided and some particularly earthy - colours, tend to lose their brightness in the flame drying process.

In order to survive Which? must maintain a very high degree of accuracy. Words are weighed carefully and an ingenious system of checks and factual verification is built into the editorial process. This means that information and data may be changed up to the last minute and corrections can be heavy. For this reason photosetting has not, so far, been considered suitable, although recent advances are promising for the future in this respect. The type is set in hot metal (by Shenval Press) After galley and page proofing is completed, reproduction pulls are made which are used as flat copy originals.

So that proofs of the illustration positives can be ready in time to paste up with the galley proofs, the-artwork has to be put in hand some days before the copy. This means that while a first draft of the accompanying text may be available, the final copy rarely is and certainly data will not be sufficiently firm to be incorporated into any but the simplest charts and diagrams. This discipline may well be beneficial, as there is less temptation for the designer to indulge his fancy in elaborate diagrams which are not immediately helpful in telling the story. However, it does mean that

illustrations have to be prepared before any detailed layout can be done and, because the subject of the illustrations themselves may be in doubt, opportunity must be given to change them at a late stage in the make-up. In order to do this, an underlying grid is imposed and illustrations are scaled to a few standard sizes. Similarly, type measures are kept constant. This may appear elementary but they are strictures which have grown naturally, not from a design theory, but from purely practical considerations of time and convenience.

The need for accuracy and the desire to be seen to be fair, also militate against the free use of graphic diagrams. Not because the drawings are imprecise, but because a simple diagram is often a relatively blunt instrument which would need half a page of footnotes to build in all the shades of meaning which it is felt necessary to spell out to the readers. A more fruitful application of diagrams has been possible in Money Which? demonstrating elementary financial and taxation concepts.

Tabular presentation, on the other hand, is far more amenable to last minute alteration and efforts have been made - some more successful than others - to make them at once immediately comprehensible and instructive, in detail, so that the reader can choose whether he wants to get merely the gist, or mull over the finer points.

The text itself is usually written in the form of a continuous prose narrative. There are times when the designers can recommend variations on this; for instance, by presenting comparable facts as tabulated summaries.

Which? is not a glamorous design product but by its very limitations it often acts as a spring-board for design ideas which, in more generous space and circumstances, might be neglected for more colourful and spectacular solutions.









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Double spreads showing three variations of openings to reports from Which? magazine

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Top illustration shows a spread from the magazine Money Which? The three-dimensional models were used to demonstrate financial concepts. The doll figures are a 'tax family' used later in the same issue to illustrate tax allowances for children etc

The lower two illustrations show presentation of comparable material in tabular and summary form









Asher Oron

Asher Oron is a freelance graphic designer devoting part of his working week to the Graphic Design Department of the Bezalel Academy of Arts and Design, Jerusalem

שמע בני בקול אמך פן תשמט הקרקע מתחתך שמע בני בקול אמך פן תשמט הקרקע מתר שמע בני בקול אמך פן תשמט הקרקע מג שמע בני בקול אמך פן תשמט הקרקע ו שמע בני בקול אמך פן תשמט הקרכ שמע בני בקול אמך פן תשמט הקרכ שמע בני בקול אמך פן תשמט הקרכ

שמע בני בקול אמך פן תשמט הקרקע מתחתך

דְּפּוּס מוֹנוֹלַיין מְסַדֵּר בְּשִׁישֵׁת הַמּוֹנוֹשַייפּ כָּל שמע בני מוסר אביך ואל תטוש תורת שמע בני מוסר אביך ואל תטוש תורת בתחילה ניתנה תורה לישראל בכתב ל בני ישראל ונשא אהרן האבנים על שמותם העליונים סביבו והיה רוחבו אמה בדפנו לנו העליונים סביבו והיה רוחבו אמה בדפנו לנו שמע בני מוסר אביך ואל תטוש תורח אמך שמע בני מוסר אביך ואל תטוש תורח אוך

באושר חיי האדם בעולם, בין העשירים או עַל רָאשֵׁי נְכָדֶיהָ טַּלְלֵי־אַהֶבָה רָעָפּוּ וּשְׂפָתֶיהָ מַלֵּ לנשיא הדירקטוריון של הבנק גם בעבודת ההוה

שמע בני מוסר אביך ואל תטוש תורת אמך

וברולכם ולא יתיצב אישי לפניך כא יבי חייך כאשר ה כישה אהיה עבר לא ארפך ולא אעובר : חוק ואבק In combining any two languages into one typographic harmony, the designer will have to deal with copy of different length (representing the same message); differing in the size of the average word, sentence and paragraph; and differing in the incidence of certain letters of the alphabet, characteristic of each language.

In combining the Hebrew language

with any of the European languages,

there is an additional problem - the

use of two alphabets different from

each other in almost every possible way: Hebrew is written and read in

"the wrong direction" - from right to left. There are no caps in Hebrew,

and only one ascender, compared to the seven in the Latin alphabet.

And while the number of descenders

is the same (five), four of the Hebrew descenders belong to "end letters",

used at the end of words only and,

text. As a result of these facts, the

line created by the x-height is very

descenders protruding above and below the x-heightsof the Latin line

make it appear larger in size and

heavier, compared with the Hebrew

of the same x-height and thickness

of strokes. Another difference is in

horizontal strokes of the traditional

Hebrew letter form, that is basically

square, compared with the thicker

vertical strokes of the Latin alpha-

And finally, Hebrew was for many

early in the history of printing, few

Left hand illustration: The top two

Hebrew Bible, published in 1488 by

The following three lines are from a

published in 1924 by the H Berthold

type faces (allowing slight variations) probably represent the basic type

forms used for about ninety percent

of all books, newspapers and other

The next nine lines show type faces

designed during the last 40 years. The three fonts of "sans serifs" at

the bottom have been developed

during the last decade. The first by Yerachmyel Shechter, was designed exclusively for EI AI Israel Airlines.

Zvi Nark is designed the following font for use with Folio caps. The author's type faces (last four lines) were designed for use with the upper and lower case of Adrian Frutiger's Univers and are described

forms of long texts, during all the 500 years of Hebrew printing history

Type Foundry, Berlin. These three

catalogue of Hebrew type faces

lines are from the first printed

Solomon Soncino.

up to this day.

on these pages.

basic changes have been added to

generations a language for prayer only, and although introduced very

bet that is round and "softer"

visually.

hand the caps, ascenders and

the strong emphasis on the

emphasised in Hebrew. On the other

therefore, appear less in the text than the descenders in any Latin in the shaping of a modern type face. With all these considerations in mind, the first decision to be made was the choice of a Latin type face, for which a Hebrew equivalent will be created. Univers was chosen both for its visual merits and the wide system of combinations it offered within one integrated visual concept.

the type face cut in 1488 for the

first printed Hebrew Bible. So while

the Latin alphabet has taken many

shapes since the invention of move-

exist to allow the designer flexibility

able types 500 years ago, very few variations of the Hebrew alphabet

Next, the level of alignment between the two alphabets had to be decided upon; the lack of caps and ascenders in Hebrew and the square form of its letters could indicate the alignment of the Hebrew x-height with the square shapes of the Latin capitals. However, this solution has two drawbacks; it looks untidy visually because the Hebrew descenders and ascenders protrude, and it is functionally limited because of the lower readability of caps.

The Hebrew type face was therefore designed to be used with the upper and lower case of Univers with alignments at x-height of both alphabets. For smaller sizes, an optical compensation will have to be considered for the lack of caps and ascenders. For display sizes, the exact match of x-heights seems adequate.

After these two general decisions many smaller problems were solved, such as the "rounding up" of some of the Hebrew letters to bring the general appearance of the Hebrew line of type closer to that of Univers, or the designing of the numbers at x-height, so that between them the two alphabets, when combined, will offer the choice of numbers aligned either at x-line or cap line.

Finally, there was the danger of too successful a match between the two alphabets, thereby losing the Hebrew characteristics of Hebrew letters. To stress the most obvious difference between the two - the opposite direction of reading - the vertical strokes have been pointed slightly to the left. This emphasis of the direction of reading increased read-ability and added to the modern type forms something that is basically very Hebrew.

16

אות עברית זאת, הראשונה שעוצבה This type face, the first in Hebrew to be available בארבעה משקלות, הותאמה במיוחד in four weights, is also לשימוש עם סדרת יוניברס הלטינית. זאת הפעם הראשונה שאות עברית the first designed specially to align with the lower case הותאמה לאותיות הקטנות באלך בית לטיני of a Latin type face, for use כך שיתאימו במיוחד, זו בצד זו, לטקסטים together in bilingual printing דו לשוניים ארוכים, בהם השימוש באותיות of extended texts. הגדולות (caps) בלבד יכגע מאוד בקריאות.

ecnolp ECNOLPעומלפן

אבגדהוזחטיכלמנסעפצקרשת םןרץ abcdefghijklmnopqrstuvwxyz

numbers 2359 מספרים or numbers 2359 מספרים

The Hebrew alphabet has no caps and only one ascender. On the other hand, the traditional Hebrew letter form is squarish. It would therefore be natural to try to align the x-height of Hebrew with the Latin caps, as in the alphabet designed by Zvi Narkis for use with Folio (left, second line). This solution, however, looks untidy visually with the Hebrew ascenders protruding, and limited functionally to short sentences, readable in caps. In the author's solution (left, first line), alignment is at x-heights, with ascenders and descenders of both languages of equal length

The illustration at left shows the differences between the two alphabets

The experimental lines above demonstrate the alignment of Oron Light, Medium, Bold and Extra Bold with Adrian Frutiger's Univers 45, 55, 65 and 75. In designing the new Hebrew type faces, both the traditional Hebrew letter forms and the modern shapes of Univers had to be kept in mind. On one hand the rhythm and contours of Univers had to be adapted to, and on the other hand the letter forms had to retain their legibility. These two visual directions were often in conflict. How far the designer has succeeded in achieving compatibility between these two alphabets, is for the professional eye to judge. Since its issue three years ago, this new type face has been used in almost every possible medium, size and dimension, in print, sign, exhibition and television. Could its wide acceptance be attributed to successful design, or does it point towards the filling of a serious gap long overdue?

The obvious height of numerals in a Latin alphabet will be the height of caps. But as Hebrew has no caps its numerals will look more natural at x-height. As can be seen at left, the short numerals can be a useful alternative in the combination of both alphabets

Language and readability

Tibor Szanto

Tibor Szanto is art director of Magyar Helikon, Department of Luxe Editions, Budapest

Les maisons d'édition hongroises ont organisé pour la sixième fois en 1959 un concours et une exposition sous le titre ,,Le plus beau livre de l'année". Les résultats qui ont pu étre observées lors du concours nous donnent l'occasion de mesurer nos tâches en vue de porter la production hongroise de livres à un niveau vraiment artistique et nous permettent de fixer le chemin à suivre. Quand nous parlons d'art en ce qui concerne la publication de livres hongrois contemporains, il s'agit de définir avant tout notre principe fondamental, à savoir que le développement des arts est le résultat d'une synthèse entre ce qu'il y a de durable dans les traditions et les conceptions modernes conformes à la vie actuelle. Appliqué à l'édition cela signifie la synthèse des traditions classiques de la typographie et des nouvelles expressions de la forme.

"The Most Beautiful Book of the Year" exhibition, connected with a competition for that title was organized by the Hungarian publishing trade in 1959 for the sixth time. The high standard of the exhibits even on a continental scale afforded a good opportunity for taking stock of the tasks facing us in our endeavours to raise Hungarian books to a truly artistic level and for attempting to outline the path we are to follow in order to advance the cause of publishing artistic books in this country. Speaking of contemporary Hungarian book art, we should at the outset define its fundamental principles, namely, that the development of the formative arts lies in a synthesis of time-tested traditions and a modern approach expressive of contemporary life. In respect of books, the traditional techniques of typography have to be applied to, and moulded after the new expressions of form.

Wydawnictwa węgierskie zorganizowały w 1959 r. po raz szósty konkurs i wystawę pt. Najpiękniejsza Książka Roku. Wyniki zaobserwowane podczas konkursu były okazją do ukazania naszych usiłowań w kierunku podniesienia węgierskich książek na prawdziwie artystyczny poziom i pozwoliły wytyczyć drogę ich dalszego rozwoju. Mówiąc o współczesnej sztuce wydawniczej na Węgrzech, chodzi przede wszystkim o zóefiniowanie podstawowej zasedy, że jej rozwój jest wynikiem syntezy tego, co jest trwałe w tradycjach, z nowoczesnymi koncepcjami dzisiejszego dnia. W odniesieniu do książek tradycyjne techniki typografii muszą być zmienione zgodnie z nowymi wyrazami formy.

Zum sechsten Mal wurde im Jahre 1959 die mit einem Wettbewerb verbundene Ausstellung "Das schönste Buch des Jahres" veranstaltet. Die auch im europäischen Masstab guten Ergebnisse dieser Schau boten Gelegenheit zu ermessen, welche Richtung wir einschlagen müssen, um den ungarischen Buchverlag zur Kunst zu erheben und den Weg zu skizzieren, auf welchem die Herstellung der künstlerisch gestalteten ungarischen Bücher fortentwickelt werden kann. Wenn wir über die heutige ungarische Buchkunst sprechen, müssenwir vor allem unser Grundprinzip bestimmen: die Entwicklung der formenschaffenden Künste erblicken wir in der Verbindung der wertbeständigen Traditionen und der die Entwicklung des heutigen Lebens zum Ausdruck bringenden, modernen Anschauung. Hinsichtlich der Buchkunst bedeutet das die Verknüpfung der althergebrachten typographischen Überlieferungen und der neuen Formensprache.

The examples show the same passage of text in English, French, Polish and German set in Monotype Garamond. It is quite evident that the best optical and aesthetic effect is produced by the English text. Monotype Garamond fails to give full satisfaction with French texts: the French text's general effect is looser than that of the English version. Because of the orthographical peculiarities of the German language, the German text appears more closely knit, which makes it less agreeable to the eye than the English text It happens very rarely that a typeface combines in equal measure the requirements of good legibility, formal beauty and adequate reproduction. If, in addition, a typeface suits equally the requirements of polyglot texts, then we would be able to speak of a perfect letter design.

The demand experienced throughout the world for more and more beautiful books and newspapers clearly raises the question of printability However great the possibilities offered by offset printing and photo-composition, it will be a considerable time before they supersede the classical forms of printing - printing by letterpress with handset types, mechanically composed types, electro or other plates. There are, and always will be, kinds of newspapers, periodicals and especially books (special textbooks. technical books, books for bibliophiles) whose runs, even in areas of widespread languages, do not exceed some tens of thousands. Hence reproductions of such publications by letterpress is quite an economical proposition and the ability of printer's types to respond to pressure remains a significant factor. Individual types have to bear a very great strain since, in the case of letterpress printing, an identical pressure of 20Kg per square centimetre is weighing on the whole surface of the form. This pressure bears equally on the thicker and thinner lines of the types and cannot be completely compensated for even if we make the forme ready with the utmost care. Therefore, otherwise beautifully shaped typefaces are today no longer suitable for text printing. Suitable types are those in which the rhythm of thicker and thinner lines has been brought into closer harmony while still maintaining their graphic differentiation. With these typefaces, what occurs in the case of the Bodoni and Didot types of Roman letters cannot possibly happen - even despite the best making ready and most careful printing the fine lines of types fade or lose their continuity after the printing of only a few thousand copies.

Now, the fact that every language has its own characteristics gives rise to several questions relating to legibility, aesthetics and technique.

As a result of the different frequency of individual sounds, the graphic form of each national language offers a specific visual and aesthetic pattern which differs from texts printed in other languages. This visual, aesthetic exterior - as we well know - is influenced most decisively by the typeface selected. Each identical sound signal. accented letter, word picture and letter group has a different role in each language. The same letter shapes appear differently in different languages. This can be easily demonstrated if we look at analytical, comparative examples. (see material at left) Identical typefaces have totally differ-

ent effects in an English or French text, with their many short words, than in Finnish (which is an agglutinative language). The text picture is different in German, where nouns beginning with capital letters alter the visual effect, and again in nordic languages - eg Dutch - where the linguistic characteristics are represented by double vowels. If, for instance, we set texts of different languages, we see from the various Monotype Roman typefaces that not every typeface brings out properly and characteristically the rhythm of a given language, nor offers the best and most readable, visual picture of the text; nor does every typeface serve the orthography of the language in question to the best advantage. A typeface which has an agreeable effect in the case of an English text would give quite a different visual, aesthetic picture (more frequently a disagreeable effect) in the case of German, Finnish or Polish texts, and even legibility may be affected. In the case of languages where the frequency of the letters a, e, n, s, t, i and g amount to twice, or three times and, in some instances even, four times that of other basic symbols of the alphabet, special attention must be paid to the graphic design of the repeatedly occurring letters, taking the following points into consider ation:

The graphic character of frequently occurring letters must not be idiosyncratic.

These letters should be brought into harmony with the other letters of the family.

The uniformity of printing and inking should be assured for the smallest sized letters of 'closed' design, such as a and s, in order that the design of letters with a more compact pattern - enclosing smaller white spaces - should render an open and clear picture.

In languages with many accented letters (such as in Hungarian, in which every sixth letter is accented) the only typefaces which should be used are those with accents which were either brought into harmony with the character of the typeface at the outset, or those which have been subsequently developed for the basic letters without any disturbing dissonances. This is important because the frequent repetition of accented letters has a fundamental influence on an area of text.

The characteristic two letter combinations which occur in certain languages should be taken into account (for instance, if Garamond italic type is used, an ideal relationship of g and y cannot be achieved). Let us take as an example the frequently recurring upper case letters in the German language. In such a case a good graphic texture can be achieved only by using those typefaces such as some classic Roman alphabets, where the capitals are considerably smaller than the Icwer case letters k and l.

а

b С

d

е

q

m

n

0

p

q

u

v

w

x

V

z

Α в

С D

Е

G

Language can never and nowhere be a finite and unchanging phenomenon. As the quality of life changes dialectically, new concepts, new ideas, new human institutions and hence new words come into being and old, obsolete expressions disappear or change. These changes are reflected in the movement and development of language.

This is an internal development which is hardly affected by conscious human volition or decision. The great linguistic reform movements of the 19th century were not really brought about by specialist linguists. Though these movements had a strong effect, development was not achieved by the decision of specialised scientists and linguists, but by social changes. The rise and growth of science, technology, cultural and political life necessitated an array of new words, rendered many obsolete and altered or simplified others. Developments in language even affect aspects of typography. Foundries casting types for printing offices have been producing for centuries the same ratios of characters to fill typecases, on the basis of a so-called casting schedule. At times statistical counts were made on the basis of literary, technical and scientific texts to determine the frequency of each letter and the figures of the casting schedules were fixed on the basis of these results. The number of individual letters in each fount is determined in such a way. Periodical calculations have shown however that, though the frequency of the sounds changes from language to language, the frequency ratio of the characters remains fundamentally the same over a long period. When studying these statistics, our eve is caught by the striking difference existing between the data relating to, for instance, English, German and Hungarian casting schedules (see right). From this we can conclude, among other things, that;

the sounds A and E have different frequency ratios in English and, for example, French; b

an obvious fact, even more interesting for us, is that in cases where identical typefaces are used for texts with the same meaning (but composed in different languages) the visual, aesthetic picture of the text pattern, and consequently its legibility and printability, is determined by the more or less frequent recurrence of various sounds in that particular language.

Eric Gill concludes his Essay on Typography with the statement that the introduction of a way of writing based on the phonetics of the individual languages would represent a

	Czech	English	French	۱ Corme	Hunga	rian Italian	Spanis	h		Czech	French English	ו Germa	Hunga an	rian Italian	Spanisl Sw	n edish
_	2150	Englis	1050	1625	2320	2450	2440	2220	á	650	English	Gorrine	1100	30	180	
al	475	425	350	475	600	350	400	400	à	000	250			180	20	
c	775	800	875	925	550	1150	1080	680	ä	225		225			20	
d	1125	1000	1050	1350	800	1100	1280	1300	a		100			60	20	600
е	1925	2800	3550	4850	2525	2250	3200	1850	à	500	575		925	120	160	600
f	225	475	275	350	550	470	400	1150	è	500	225		925	200	20	
y h	775	1175	280	1350	600	360	400	500	ë		60				20	
i	1400	1675	1800	2000	1350	2500	2400	1200	ê		125			60	20	
i	650	125	130	100	550	100	200	300	ĕ	400					100	
k	1000	175	75	300	1200	50	40	600	í	825			200	50	120	
	1050	900	1250	950	1350	1700	1200	1225	1		100			150	20	
m	825	1550	1725	2875	1700	1650	1800	1950	ŕ		100			50	20	
0	2025	1600	1800	75	1125	2300	2000	1350	ó	175	100		350	50	160	
a	850	450	700	250	400	750	750	400	ò					150	20	
q	100	150	350	100	75	375	800	75	ö			130	425		20	
r	1250	1300	1650	2125	1150	1625	2000	1775	ô		50			50	20	
S	1550	1675	2225	1625	1850	1775	2400	2150	ŏ				350			30
t	1225	18/5	1625	1450	1050	1200	2200	1825	р	125			150	50	160	50
u	1050	300	450	275	750	475	400	950	u h	125	75		150	175	20	
w	100	500	60	440	75	40	20	80	ü				275		20	
x	100	150	225	100	100	100	160	50	G		50			50	20	
y	450	500	100	75	900	50	240	350	ű				150			
z	575	100	200	400	1025	380	120	50	ů	225	400				20	
	475			000	475	250	100	175	6	250	100				20	
A	1/5	200	200	200	1/5	250	100	175	ñ	350					100	
C	125	175	150	100	80	175	120	200	ř	325						
D	80	150	175	150	80	125	200	175	š	450						
E	150	300	275	150	150	225	200	200	ť	75						
F	75	150	80	125	80	100	80	175	ý	375						
G	50	150	100	150	100	125	80	175	z	375						
н	80	1/5	/5	150	105	200	40	125	á	50			60		20	
1	125	150	100	60	100	60	40	175	À	00	40					
ĸ	80	80	25	125	80	20	20	200	Ä			50				1.11
L	80	175	150	100	80	150	20	150	Å							150
M	100	350	125	150	100	175	80	175	E	25	75		60	40	20	
N	100	200	175	100	100	175	120	175	Ë		60			60	20	
0	100	200	1/5	100	80	125	80	175	Ê		60			40	20	
r O	40	100	100	40	30	100	80	40	Ĕ	40						
R	75	150	150	100	75	150	100	150	í	40			30		20	
S	125	275	175	250	125	200	100	275	ì,					30		
т	75	275	150	150	100	150	100	150	ó	25			40	40	20	
U	50	250	175	100	75	75	160	150	ö			40	40	40		
V	/5	100	30	125	30	125	20	50	ő			40	40			
X	50	100	100	50	40	50	80	40	ú	40			40		20	
Ŷ	50	125	50	20	50	25	50	50	ù					40		
Z	100	100	75	100	100	75	60	50	ů			50	40			
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revol	ution in	n the h	Istory	of the	tical				č	20						
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solve	the ma	ajor pro	oblem,	which	is				Ň	20					40	
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that lang grap employs for the reproduction of texts only a few products of a restricted number of type casting plants and matrix manufacturers. So far, these establishments have treated the orthographic and aesthetic requirements of individual languages which relate to the means of typography - the letters - only under duress and as a problem to be faced reluctantly.

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Type designing in the future

Hermann Zapf

Hermann Zapf, a former chairman of the Type Designers' Committee of the Association Typographique Internationale writes about the fundamental changes facing the alphabet designer today

Why, actually, do we design new alphabets nowadays? There are plenty of them, an enormous choice, if you look at any

good printer's type specimen book. But new developments are taking place. For example, the newest composing systems using cathode ray tubes - and one day, before very long, we shall use the laser beam - bring with them some absolutely new technical problems, many more than the past with its solid foundation on historical development in typographic styles.

The work of the type designer (or better let us start calling him the alphabet designer) will certainly not become easier. Not only will the scope for developing new alphabets be narrowed, but technical considerations will limit it still further. And now that automatic reading machines will have to be taken into consideration, yet more difficulties arise, when at the same time we are hoping to use a Latin alphabet that continues to satisfy our artistic sensibilities.

Changes in our reading habits have an additional influence on the development of new alphabets. Until a few years ago, reading was a matter of eye and brain. And the human eye was the only judge of good or bad legibility. The artistic qualities of a type design were predominant. We might decide that this alphabet was less perfect than that but, al the same, we would take in the meaning of words and sentences, even if they were printed in a type face of inferior design.

Reading machines are not interested in questions of forms or aesthetics. For them it is entirely a matter of differentiation if we want to keep down the number of reading mistakes which alone will justify the use of such complex and expensive equipment.

Our eyes and brains are able - from experience and by using our intelligence to see things in their context to grasp even doubtful forms. We might say: this is ugly, or that is difficult to read; but we can understand it all the same. A reading machine, however, can only recognise or fail to recognise.

Leaving the reading machine and coming back to reading in the conventional sense, we have less and less leisure for this. The large amount of printed matter which we have to work through every day compels us to read hastily - not that this is always made easy by the way printed matter is presented to us.

For those making the transition from hot-metal to photo-composition, or those working in both media, it must be emphasised that, in principle, the whole system of point sizes no longer has much meaning. By comparison with hot-metal composition, filmsetting is extremely variable in size. Theoretically, at least, we have an infinite number of interim sizes at our disposal which cannot be properly classified. This also goes for interlinear spacing. And another warning: not every photo-composed type face, say 10pt Bodoni, looks the same as 10pt Bodoni in hot metal.

Yet another problem deserves our close attention. This has to do with the fact that film-setting is mostly used for offset printing, which has none of the greater or lesser ink spread usually produced when printing metal type by letterpress. The punchcutter of the past took this thickening into account. Its absence must equally be taken into consideration by the designer of alphabets for present-day methods.

Jenson or even more, Bodoni, had their punches cut with their more or less primitive technology in mind, using the handpress and dampened rough-surface mould paper. All this has become obsolete in these days of mass-production and high mechanization.

The age of electronics signifies the second industrial revolution - or perhaps we should call it the cybernetic revolution. Can we, in the graphic arts keep pace with this rapid development? Computers, and with them automatic typesetting and hyphenation, force their way into our composing rooms. They take no heed of tradition and craftsmanship. Whether it makes sense to us or not, we have to grapple with automation and are increasingly surrounded by computerized printing production.

Thus, problems of forms will no longer be the sole preserve of the designer. He will have to come to terms with the electronic technician, just as, until recently, the punchcutter was his colleague.

He has to accept these changed conditions. More and more his task will be to preserve what remains valid in tradition and to coordinate it with the practical purposes of the new technology.

To me it is certain that there will be no really fundamental changes in the basic shapes of our letters. Legibility, as we know from our schooldays, must be preserved, and I am convinced that experiments in developing entirely new sets of characters are doomed to failure, however ingenious and carefully considered they may be.

The future belongs to team work. No one person alone can solve the tasks to come, though creative ideas will play a large part in doing so, and it is here that the analytic approach in collaboration with the programmer and electronic engineer will be put to the test. This analytic approach is important - through it the designer is forced to work in a strictly logical sequence.

I am carefully avoiding the use of the term 'typography' because typographic design is too closely linked in my mind, with the old letterpress principles to have much meaning in this world of computer programming.

Film-setting and computer composition obey different laws. No longer is it a matter of typographic design, with all its more or less willful decisions, but of photo-technical disciplines which are imposed on us by the clear logic of electronics.

We have to take into account a sharp distinction between computer typography intended for the production of a rigid type image in metal and computerized composition programs arrived at by analytic methods and intended for photocomposition of one kind or another.

As part of this analytic approach, I wish we had the courage to throw overboard another inheritance of the 19th century, namely the typographic point system. I would like to see it replaced by a system linked with the metre, which would at the same time answer the needs of photo-composition. Various proposals for a metric point system have already been made.

First of all, it would be universal. Second, it would naturally slot into the metric measurements used by electronic engineers. Third, on the assumption that both these modules may have to be used side by side for some time, it should easily adapt itself to being used within a decimal module (and the numbers by which 10 can be divided, namely 2 and 5) and a duodecimal module (and therefore the numbers by which 12 can be divided, namely 2, 3, 4, and 6).

In photo-composition we no longer deal with a rigid three-dimensional type body, but only with the visible optical form of the letter. Normally, in the past, the minimum leading that could be added when something had been set solid was 1pt. And at best this would have been a very time-consuming process. Today, we can vary the distance between lines by as little as fractions of a point, but we must make the decision beforehand. On the other hand, the speed of computer composition is such that it would be no major problem, if necessary, to reset a whole book with different inter-linear spacing. Therefore, we must put our mind to the establish ment of a new system which enables

us to specify the true measurable data of characters and lines, and not merely the height occupied by the type body, as this rarely corresponds with the visible image of the letter.

My hope is that one day the x-height of lower case letters and the height of capitals, as well as the distances of lines will be expressed in millimetres and decimal fractions of millimetres*. Only thus will it become possible to make a proper specification for a photo-technical composing program (the so-called 'parameter').

Moreover, a parameter specification would contain all the details for the type face (or, perhaps, we had better call it the alphabet number), the line length in mm, and the number of lines per page.

Until now, details of every alphabetic form could be controlled at the stage of design, but became fixed and static the moment it had been finalized. But from now on, there are few limits to the formal changes that can be brought about by computer programming linked with photo-composition and scanning devices.

Many new ways of producing alphabetic images are either here already or just on the horizon; ways completely unthought of until quite recently. This in itself contains the danger of things getting out of the designer's control. Who shall be the master that allows or condemns genetic changes and mutations when everything is in such a state of flux?

The alphabet designer's task is to design legible and good characters for the purpose of the future. And the best way in which he can pay respect to the great achievements of the past is by aiming at something that expresses the spirit of the present - as in industrial design and in the arts. We should not go back into the past, particularly to the forms of the 19th century - to an easy neo-historicism which would permit us, thanks to our modern techniques, to copy and cheaply use the style elements of the past.

*see article on millimetric typography on page 21

The demise of the point system in sight

Ernest Hoch

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M. Cahierre addressing the International Typometric Conference convened by the Icograda Standardization Commission in 1967

Grandjean's table of proportions for the Romain du Roi (reproduced from Jammes, La Reforme de la Typcgraphie Royale)



The new British Standard Specification 'Typographic measurements (metric units)' is the world's first metric typographic standard; it is also the first indisputable outward indication of success in Icograda's seven year old endeavour to substitute an international, rational and unambiguous measuring system in typography for the inherited condition in which the printing industry uses at least four mutually incompatible units of length, namely the inch, the millimetre, the Anglo-American point and the Didot point.

The size of the two 'points', moreover, is ambiguous and differs between countries, between manufacturers, or even between the American and British plants of the same manufacturer. The only thing they have in common is that neither is sensibly or exactly related to either inch or metre. To regard the fact that 2660 Didot points equal 1000.333 mm, or that 72 Anglo-American points equal 0.996 inch, as in any way constituting dimensional correlation overtaxes engineering sense of common sense; it requires a strong emotional attachment to the black art traditions of the printing industry.

In May 1966 M. Loic Cahierre, Director of IPREIG, the French printing industry's research institute and a member of our Standardization Commission, took part in our project conference in Paris. At the Inter-national Master Printer's Congress in Cannes later that year M. Cahierre tabled a resolution which requested the International Bureau to coordinate all typometric work already in progress and draw up a tentative timetable for the changeover. The congress adopted the resolution. (1) We hoped that Icograda could from then on contribute its share to the work without being the sole international body committed to consistent promotion of typometric progress. It was only when the master printer's

International Bureau decided to shelve the Cannes resolution that we realised the new attempt would peter out as several earlier attempts had done (international master printer's congresses had adopted resolutions for a metric typography before) unless lcograda itself adopted a more forceful policy and undertook steps to get the Cannes resolution implemented. Our first such step was to convene an international typometric conference for June 1967 in Duesseldorf, Germany, to coincide with DRUPA.

In May 1967, at its Rome conference, the International Association of Research Institutes for the Graphic Arts Industry (IARIGAI) adopted a resolution that stressed the need for a single, coherent and unambiguous system of mensuration for modern industrial development, and expressed support for our Duesseldorf conference.

Although organized by designers, the Duesseldorf conference was predominantly representative of industry, and the speakers represented industry exclusively. It was agreed to set up an International Typometric Centre to undertake the coordination demanded by the Cannes Congress. Icograda hoped that the International Bureau might at some later date be persuaded to participate.

Those who agreed to serve on the centre's executive included presidents and high officers of master printers' federations as well as machinery manufacturers' and similar associations from several countries. Because suitable headquarters were lacking, the centre was never legally established. By 1969 the objective need for such a body had begun to recede and by 1971 has altogether ceased to exist.

In 1965, the United States Senate authorized a feasibility study on the

Range of preferred sizes

mm	mm
1.75	6.0
2.0	7.0
2.25	0.8
2.5	9.0
2.75	10.0
3.0	12.0
3.25	14.0
3.5	16.0
4.0	18.0
4.5	22.0
5.0	26.0

First draft ISO proposal for metric typographic measurement: based on the British Standard Specification (BS 4786:1972), in accordance with Icograda recommendation

metric system. (2) By 1969, typometric standardization was on the agenda of the Convention of the International Newspaper and Color Association (INCA), and the American Newspaper Publishers' Association had a committee working on it.

The subcommittee instituted by the British Standards Institution (BSI) issued its report in 1969. Its findings were adopted by the main committee and embodied in the new British Standard which has now been put forward for consideration within ISO. The new ISO/TC 130 (Graphic Technology) set up a preparatory working group to deal with this subject and accepted an offer by the BSI to undertake the secretariat of the working group. Besides the first ISO Draft Proposal (3) based on the British Standard, the working group will study a number of metric proposals from other countries.

It is gratifying for loograda that at least two of these place emphasis on measuring image size and on clear distinction from traditional body size measurement. As one of the contributions to the discussion of visual size, arising from the Icograda project, Hoch and Goldring (4) proposed a system of dimensional references that allows varying degrees of approximation. (Their diagrams are reproduced in figure 1, on page 10) References to specific processes such as metal founding enter only in their appropriate context. On the other hand, variants in ascender heights, accents, etc., can be numerically expressed; taking incidence of each element in different languages into account, the relevant dimensions may be referred or omitted.

The long haul from early beginnings

The earliest attempts to standardize body sizes appear to have been made

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at the Imprimerie Royale, in connec tion with Grandjean's work on the Romain du Roi; Grandjean's first specimens are numbered after a method very close to the point system. (5) It was not, however, until Pierre Simon Fournier started his own foundry that type of systen atically related body sizes became commercially available. A long history leads from there to Firmin Didot's attempt in 1811 to introduc a 'millimetric typography'. The size of the earlier Didot point (0.376mn was exactly the 864th part of the pied du roi: 6 points to a ligne, 12 lignes to a pouce, 12 pouces to a pied. There was none of the arbitrariness of the later American poin which immediately came under criticism as 'capriciously and unscientifically selected, not based on any regular fraction of the foot (metre' and which owed its subsequent general acceptance to an extraordinarily rapid concentration of capital in the founding industry (with one group of foundries eventually controlling 85% of the country's total output). Nor was there any of the half measure that had allowed Fournier to take over t names but not the dimensions of th official standard. Didot's rejection (the earlier Didot point and his proposal to replace it by a point of 0.4mm was not a change of mind: it was a reflection in a logical mind of the replacement of the pied du r by the metre. With the impetus of the French Revolution spent, and without the support of Napoleon. Didot could but witness the victory of his earlier point, which he knew had lost its raison d'etre.

When the Icograda project started we were aware that the prospects or any standardization project depend not merely on its intrinsic merits, b also on the historical context. Logic ally, little has changed since Didot drew his conclusions from the adoption of the metric system, or since Updike wrote that 'until a type system is formulated which is in full and regular accordance with the metric system, perfection will not be attained', (6) or since Stork, on behalf of the Dutch Federation of Master Printers, advocated a consistently metric typography at the Eighth International Master Printers' Congress in 1954. (7) Technologically however, the printing industry has changed to such an extent that not acting logically has become absurd. In Tracy's words, (8) 'adherence to a system of type measurement formulated in the eighteenth century is hardly realistic'. The cost, both of retaining the status guo and of the eventual rationalization, increases the longer rationalization is delayed.

Our project started against the background of an enormous expansion in data processing for business. military and scientific purposes. The money poured into these developments 'has gone to create new printing devices outside and unconnected with traditional industry; devices created by scientists and engineers who either haven't heard of, or choose to ignore, pica ems and points, and prefer centimetres and inches'. C J Duncan (9) wrote this in 1964, a year before the Federation of British Industries demanded the general adoption of the metric system throughout British industry, and before the commitment by the British Government to a phased ten-year changeover. In 1964, too, the first international Computer Typesetting Conference took place in London

Capital investment and technical problems

Tracy (8) named the composing machine and photo-composition as the two factors that leave the printer not necessarily as much in bondage to traditional measurement as he was before the introduction of mechanical composition'. Even in publishing, the investment in standing matter no longer plays the part it played a few years ago. Where the production of successive editions, with or without changes in format and typographic specification, can originate from one and the same tape, there is no longer any truly technical or capital investment consideration against departing from the traditional point systems. Taking the industry as a whole, the weight of capital investment has shifted towards areas to which the traditional point systems are altogether irrelevant, or where continued adherence to them does not have its roots in technical necessity.

The adjustments required to composing machines are comparatively simple, their extent and their cost has been reported in detail by Schoening. (10) Practical problems of changing over before metric material is generally obtainable - transitional problems like those of the combined use of metric and traditional material - were investigated by Grabau. (11)

On the foundry side of the industry, whereas any new type-designs can be produced to new metric sizes, the foremost short-term consideration for all existing designs is, of course, the continued use of existing punches and matrices. More serious problems of capital costs are involved for founders' type where rigid moulds do not have the flexibility of mechanical casting equipment. International standardization on the other hand, particularly of height of paper will reduce the necessity for multiple stock keeping.

Legal implications

In France a point system has, by implication, been illegal since the French Revolution made the metric system the only legal system. Now the point system has been outlawed in the German Federal Republic: a section of the Order of 26 June 1970 made under the Units of Measurement Act of 2 July 1969 prohibits the use of the 'typographic point' in business or official communication in any form whatsoever after 31 December 1977. The Act gives legal force to the principle of the Systems International that only metric units may be used for linear measurement; the Order applies that principle explicitly, inter alia, to the 'typographic point'.

The Verein der Schriftgiesser (Association of Typefounders) has lodged an 'objection to the abolition of the typographic point system'. In the entire printing and allied industries there is only one small part (traditional foundry) of which one section (metal type casting) has a technically arguable case for adhering to the two outdated point systems: hence a transitional conflict between the urgent need for an international. coherent measuring system and the limited sectional interest which adheres to the two mutually incompatible point systems.

Clearly, from the technical and economic viewpoint, the thought that a sectional interest of a relatively shrinking small part should dictate to the entire industry and bar its way to a universal and rational system of measurement is totally untechnical and uneconomic.

The structure of the type foundry industry itself has altered as a result of technological change. Within the Association Typographique Internationale, this structural change led to the reorganization of the Committee of Type founders into a Committee of Type Manufacturers. Unless that newly reorganized ATypl committee were to make a mockery of the significance of its own new existence, it must lead the type founders towards a policy of positive adjustment to a metric and increasingly photo-oriented world. Icograda can contribute to developing such a policy, and hopes to cooperate with ATypl to that end.

The role of Icograda

'When we launched this project we were aware that actual change could only come through the industry itself. We saw the character and limits of Icograda's function, arising from an appraisal of the social role of the design profession, as such that our main influence, beyond our own research efforts, may well be to provide a focal point and persistent stimulus. In order to succeed it was essential that we establish close and friendly working relations with the most important associations in the printing industry, and that we promote the study of the problems connected with international typometric standardization through national standards institutes, and eventually through the International Standards Organization.' (12)

That first objective of Icograda's typometric project has been achieved. The objective of the next phase is an ISO Recommendation.

During that phase, our working relations with industry associations must be intensified, and graphic designers will continue to represent their respective Icograda member associations on technical committees of their national standards institutes. Particularly in those countries where our member associations have not yet begun such work, there is need for urgent and coordinated action if we are to live up to our responsibility in this matter, in the various countries and through Icograda itself and its liaison with ISO, inside ISO/TC 130.

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15 Loic Cahierre Typographie et Systeme Metrique La France Graphique No 233. (October 1966) As a means of adding to the collective knowledge of our organization, the Executive Editor invites contributions to *icographic* from members or suggested experts in member countries. Members can assist in ensuring a steady flow of source references, and of book reviews, as one facet of this function of *icographic*.

Besides publications from specialised publishing houses or specialist series concerned with printing technology, the proceedings of specialist conferences provide useful sources. In this issue, we make a beginning with brief notices about the proceedings of a conference organized jointly by the International Association of Research Institutes for the Graphic Arts Industry and its British member association, on a new series of text books from a British publishing house, and on a learned journal.

PIRA/IARIGAI

1970 international conference on applied lithographic technology proceedings

PIRA, Leatherhead, Surrey, England £15.00

The papers presented are grouped under three headings: graphic reproduction, printing processes and materials, and raw materials. In comparison with similar restricted circulation reports of ten years ago this is well produced at probably little real increase in cost. Thus technological investigation as exemplified in this report appears to create positive improvements in printing. The mixture of ad hoc methods and

more fundamental descriptions of print technology seem to indicate that there are still greater improvements to come. Although the approach to many of

the subjects seems more detailed than their counterpart coverage of ten years ago, opinion still seems to rank high in the advice given in the discussion material.

Library of Printing Technology Focal Press Ltd, 31 Fitzroy Square, London W1

Edited by J E Reeve Fowkes MIOP, Head of Department of Printing, Southampton College of Art. A new series of text books for courses for printing technicians and technologists;

Design for print production H S Warford 216pp 32 phot 77 diag £3.25

Mr Warford seems to be pointed in several design directions at the same time. His book is comprehensive, oriented towards problems that actually occur, and thus related to most of the students who will read it. Personal ability as opposed to personal prejudices make this book superior to those numerous square thin volumes that are produced. Letter assembly in printing D Wooldridge 316pp 134 diag £4.00

The book covers the various methods of letter assembly and make-up, and the preparation of material for these processes, the evaluation of their products and control of quality, and the necessary production planning. A rapid look at page proofs indicates that it seems comprehensive and would prove useful to design students.

Visible Language, formerly Journal of Typographic Research c/o The Cleveland Museum of Art, Cleveland, Ohio, USA 44106 (enquiries about cumulative index to the publishers)

Communication theory and typographic research Randall Harrison and Clyde D J Morris, volume 1 April 1967

Typography that makes the reader work excerpt from Book Production Industry, February 1969 (Penton Publishing Company) Joel A Roth, volume 11 2 April 1969

Words in their place Rudolf Arnheim, volume IV Summer 1970

The durability of fifteenth century type Michael Pollak, volume V/2 Spring 1971

From a review of references to early typecasting and typesetting prcatices, the author computes the amount of labour required to handcast 1000 pieces of type in the fifteenth century, and reaches a figure of fourteen manhours. He applies labour cost to the publication of a fifteenth century book, the works of Flavious Josephus printed at Venice in 1486, postulating different sizes of editions. Working on the assumption that excessive labour costs per copy would have made this book and others like it uneconomical to produce, he concludes that incunable type was able to withstand at least 10,000 to 20,000 blows of the platen but suggests that its life expectancy was actually much higher. He supplements his cost analysis by citing other evidence to show that incunable type was fairly durable.

Linguistic features of scribal spacing Virginia J Cyrus, volume V/2 Spring 1971

In contrast to the regularity of the letterforms in hand-produced Old English manuscripts, the scribal spacings show great variation in both size and positioning. Examination of the spacings in the Tollemache manuscripts of Alfred's Orosius reveals extensive patternings which can be shown to correspond with such linguistic features of the text as syntactic structures as they are identified by immediate constituent analysis. Thus, the manuscript provides graphic evidence of the non-segmental features of the language which before were only indirectly inferable.



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

The aims of ICOGRADA are:

1

to raise internationally the standards of graphic design and professional practice by all practicable means. 2

to collect and exchange information on professional, educational and technical matters. 3

to improve graphic design training and to assist the interchange between countries of graphic designers, teachers and students. 4

to organise exhibitions, international assemblies, congresses and symposia and publish documentation on graphic design and visual communications technology, including a News Bulletin. 5

to act as an international forum for co-operation and exchange of views between designers, organisations representing professionals from allied and other fields and those of commerce and industry. 6

to encourage the better use of graphic design and visual communication as a means to improve understanding between people everywhere.