

Outside the whale*

Peter Burnhill¹

In the 1960s, design education in the United Kingdom was in a state of flux. It was changing from a more or less egalitarian system, first established in the 1830s, to one which sought to separate the sheep from the goats on academic lines at a time when a more comprehensive system was being developed in schools of general education.

This account tells of a design course in the 'vocational' sector of the new system which made typography its central design discipline.

*with apologies to
E.P. Thompson

1. Affiliation: Onetime member of Mr Blunt's elementary school class where he was taught Formal-Writing-And-The-Binding-Of-Books about the time the fascists in Germany were deconstructing them by fire.

2. NB A 'nut' is half a 'mutton', a mutton being an em. PB

Information design journal 8/3
(1996) 195-218

One who abandons all forms, conditions and constraints, who merely acts in some random and entirely wilful manner is surely not engaged in artistic creation, whatever else he may be doing.

(Noam Chomsky *Problems of knowledge and freedom*, Fontana/Collins, 1972, p. 45)

It is time, after half a millennium, for the re-assessment of typography To print the slogan 're-assess' means nothing, of itself. Qualified, defined, means know, means find *the nuts of 'em* For each text to be translated into typographic terms, determine not just how the text appears, but what it means to say. Discover if there be an existing typographic language which allows this fullest meaning to be set out. If not, how must the typographic syntax semantics be so changed that this most loved and fullest meaning is set clear Admit constraints: then, having admitted, fill with discovery.²

(Anthony Froshaug, *Typography is a grid*, *The Designer*, London, January 1967)

This paper is about the design course at Stafford College of Art and Design, UK, which my colleagues John Burgess, Alan May and John Cole, and I initiated in 1965. It had typographic design as its central discipline, and ran for some twenty years independently of the UK system of examinations in art and design subjects. To set the Stafford course in context, it is necessary to say something about the situation in art and design education at the time, and about some of the wider aspects of post-war development. This is essential background to our decision to make typography an autonomous discipline rather than remain a Cinderella in the kitchens of the castle of Baron Graphics and his daughters, Advertising and Precious Books.

Of sheep, goats, dogs and the CIA

The 1960s was a time of turmoil for art and design education in the UK. This was brought about by changes from a more or less egalitarian system (initiated by the Board of Trade in the

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1830s for the training of artisans and craftsmen in response to foreign competition in the fancy goods industry) to one which sought to separate the training of academically able sheep from the also-ran goats in preparation for the eventual burial of the former in the bureaucratic belly of the polytechnic-cum-new-universities whale as we now know it.³ This saw the end of the art/design schools as independent institutions each with its own ethos and local community affiliations. We who tended the smelly tribe were left to forage in the by-ways and backwoods for many years.

The change was not well received. By 1968, the sheep were in revolt and had to be put down with the aid of police dogs, the UK government having more than half an eye on troubles on the streets of Paris and amongst the student population of the USA at the time.

In the *Sunday Times* newspaper (4 July (!) 1968), Sir John Summerson, the government-appointed chairman of the committee set up to overlord the change and to manhandle it through, found himself able to say of the troubles in art schools up and down the land:

The students want to see only two divisions, between fine art and design. But they do not work out what they want in detail and don't see how their ideas will work out in practice.

Sir John omitted to say that the reason the students wanted that kind of division rather than the other was because, under his new system, all students irrespective of interests, were required to follow a fine-art-directed foundation course of Basic Design.⁴ For the most part, this was a set of formalistic exercises rooted in the then fashionable art-style of abstract expres-

sionism and flavoured with some of the more mystical language of Bauhaus pedagogics.

One of the larger banners flown at the time by the painter-advocates of Basic Design was the notion that a good dose of it would wipe clean the minds of new students of all preconceptions regarding art and design practices. William Feaver, art critic, said in *The Observer* newspaper (22 March 1981) 'Basic Design course procedures ... had a good deal in common with Cold War brainwashing techniques.' We now learn that abstract expressionism was secretly funded by the CIA as a Cold War cultural weapon designed to counter Soviet cultural activity in Western Europe. One known consequence of the introduction of Basic Design as a 'foundation study' for art and design students was the wiping of the curriculum clean of the intellectual discipline of drawing – our renaissance heritage – for several decades.

Three years before the student sit-ins, and conscious of the Cinderella-like status of typography, we decided to fork-lift the lass out of her kitchen and give her the chance to declare unilateral independence.

Ye former times

Before the second world war, typography, as we were taught the subject in art school, was largely a matter of learning to draw letters of the alphabet paraded in fancy dress as a word or two on book jackets, advertisements, title pages of limited edition books and headings for magazine spreads. The text was no more than blocks of grey matter. If record sleeves had been marketing devices at that time, they too would have appeared on our tutor's list of jobs to be done

3. An amusing account of the start of formal design education in the UK is given by Quentin Bell, *The schools of design*, London: Routledge and Kegan Paul, 1963.

4. Statements about Basic Design by some of its leading lights (for example, Pasmore and Thubron) is given in *The developing process*, a catalogue of the exhibition at the insti-

tute of Contemporary Arts, London, 1959, published by King's College, Durham University.

A thorough critique of Basic Design was given by Peter Lloyd-Jones on BBC Third Programme and printed in *The Listener*, 10 October 1968. See also de Sausmarez (1964).

for the monthly 'crit'; some perhaps to be destined for the end-of-the-year art exhibition!

The run-up to 'doing' typography was the pushing around on sheets of white paper, grey and coloured paper shapes, cut-out photographs and black lines to simulate 'type'. This was called 'experimenting' – something akin to television's Blue Peter art classes for children, or those Basic Design exercises of the 70s. I can see now how we would have been encouraged to use the 'Mac' had such a thing been around at the time.

Typography – the modular co-ordination of written language – was the province of the compositor, or was left to the tender mercies of the typing pool. Even as late as 1967, Fernand Baudin (1967, p. 374) was able to write:

Many art schools all over the world teach typography as a visual art But typography ... as a rational discipline for the proper design of intellectual tools is largely ignored in practice, and almost totally neglected as an object for special study and research.

If this is still the case, and given the demise of the compositor with his experience and tacit knowledge of the structure of written language, what then remains between some semblance of rationality and chaos other than the Rule of Thumb Book of the typing pool and the systems analyst?

Of Mr Babbage, Mr Senefelder, Mr Gutenberg and Mr Chomsky

The history of typography since 1945 has still to be written. From my viewing point (b.1922) it will have three activating ingredients.

First, the raging determination of young people returning from the war against facism never to allow such lunacy to happen again – a life-lasting salute to those who did not return. This accounts in no small measure for the adult view of young designers and design students at that time to see in design practice a force to set

against any dying of hard-won light. For example, I am sure that the statement, *First things first*, published by a group of young London-based typographers in 1964, and much appreciated by others elsewhere, was fired by that rage. It stands in no need of apology and is as pertinent today as ever it was.⁵

The second is technological change sparked initially by the dire need in wartime to decode enemy signals quickly and to be able to track and target fast-moving aircraft using agile computational means achieved by the application of electronics to the analytical engine of Mr Babbage.

The development of such mathematical engines, coupled with post-war improvements to the strike-on character assembly system of the ubiquitous office typewriter, together with the small offset development of Mr Senefelder's lithographic printing process began, in the post-war decades, to challenge the five-hundred year old monopoly of Mr Gutenberg's method of writing without a pen.

Although the old way of prefabricating letters and assembling them struggled for decades to up-date its systems by photographic methods, and by trying to bolt the front end of number crunchers to the back end of its moving arm mechanisms, it had no option but to give up these heroic attempts to prolong active life when chips with everything appeared on the menu around 1985.

The third harbinger of change in the early post-war period was the revolution in linguistics ushered in by the publication in 1957 of Noam Chomsky's *Syntactic structures*. Chomsky showed that our ability to produce sentences never seen or heard before is a biologically determined state. It seems we are born having command of the rules of sentence design and

5. *First things first* was first published privately in January 1964 by Ken Garland. It was re-published in *SLA journal*, no. 134, April 1964.

that we share this with one another irrespective of cultural differences in our sign system, just as we share our sense of order in space. This qualitatively different approach to the nature of language and learning put the cat amongst all the previous occupants of the pigeon loft; in particular, the behaviorist and post-war schools of 'structuralism' and born-again semiotics which regarded language as a purely cultural phenomenon – the 'bucket theory of mind' as Karl Popper (1972) called it.

Although the ping-pong game of 'structuralist' theorising and Skinnarian behaviourism, so opposed by Chomsky, still has echoes in the staffrooms and journals of pop-academia – including the notion that no common ground exists for objective appraisal as between this and that piece of typography other than the social condition of their existence – such games can be relegated to the flat earth file of philosophical relativism, of which Chomsky (1976, p. 132) had this to say:

The principle that human nature, in its psychological aspects, is nothing more than the product of historical and given social relations removes all barriers to coercion and manipulation by the powerful... the 'empty organism' doctrine is the most natural one for them to adopt.

That truth, over this century, is inescapable.

In my view, Chomsky's work provides theoretical underpinning (not a DIY handbook) for the intuitions and tacit knowledge which typographers have always shown in their concern to match the intrinsic structure of the language with an *equivalent* system of visible attributes. Chomsky provides a basis for objective appraisal of typographic configurations which need not be bedevilled by the dust of mock battles between the Tweedle Dum of this and the Tweedle Dee of that manner of speaking, as seems to have clouded discussion of typographic design education and practice since the first world war.

The Stafford course

The autonomy of the Stafford course in its content, teaching method and direction, was made possible by the support of Staffordshire County Council Education Committee for teacher-based initiatives, and by the financial help it gave to students who, not being on courses leading to a first university degree, were not eligible for grant aid from central government at that time.

The main aim of the Stafford course was to extend literacy through the study and practice of typographic designing and the learning of skills in drawing (formal and informal), photography and photographic studio practices, and in the use of hand and simple machine tools for small-scale construction work.

Studios and workshops for these purposes were course-dedicated. The print production section was manned by a succession of retired printers over many years and included workshops for character assembly, imposition and print production using letterpress and small-offset processes. The design course had a close and informal working relationship with the staff and facilities of a department of mathematics and computing, with nearby schools of trade printing and with the staff of the Department of Psychology at Keele University.

In addition to the use of design and production facilities at college, students were able to experience 'real-time' design practice through a nationwide network of some thirty firms and institutions which were prepared to take students into their offices for several weeks at a time. In addition to several such placements in differing kinds of office during the four-year course, all students had an opportunity to gain work experience from the flow of design jobs which came into the department from the immediate locality. This included participation in research in typography by Dr James Hartley of Keele University sponsored by Unesco and

the British Social Science Research Council.

Because of the 'real-time' design experience gained in these ways, college-based work could be largely exploratory. It was often open-ended in time, it was not always related to definable ends and it reflected individual requirements and interests. The typographic design aids published by the department from time to time were often the result of exploratory work of this kind done by individuals or by groups.⁶

The construction workshop was always a focus for extra-mural design work of a non-linguistic kind. Such work included the construction of educational aids developed in association with local schools, exhibition construction, games design, model-making and the building of stringed instruments. The exploration of three-dimensional geometry and its relation to drawing was also centred on that workshop.

The unmetabled character of work and the breakdown of year groups after the first year meant that external examinations could be taken *en passant* by students if they so wished. These included qualifications awarded by the City and Guilds of London Institute in botanical illustration, technical illustration, print design and photography, in addition to assessments for membership of professional societies.

Except for these examinations, which were optional, the course had no internal examination system or final qualifying hurdle. There were no strict entry qualifications and no writ-

6. Stafford, Design Department publications:

Multiple grid indicator, 1968

Information coding, 1969

Turning over a new leaf (page editing algorithm), 1969

Design dialogue 1, 1969

Dimensional relationships in the composition of text, 1970

Headings in text, 1970

Comparative settings of narrative text, 1971

Comparative settings of text, 1971

Design dialogue 2, 1971

Word spacing/line spacing in the setting of text, 1977

Comparative settings of numerically encoded text, 1977

Comparative settings of text: the paragraph, 1977

ten syllabus. Students could work in the department for up to four years. Thirty to forty were in the department at any one time. About one in ten decided to leave after the first term.

Teaching method was based on the notion that journeys are more interesting than arrivals and that learning is a consequence of having to deal with problems which, in typography, are concerned with the structure and use of written language artefacts and with graphic aids to understanding. Formal lecturing was minimal. Brainstorming sessions were useful. Team teaching was common.

Craftsmanship was stressed at all times but, as an idea, not confined to the use of tools and materials, and used as a way of maintaining the links between thinking and doing.

First year work was task-based and was planned to engage the student directly in the use of the print production workshops and other studio facilities and workshop practices. The 'raw material' for this was the student's own written language produced in response to defined problems in communication by written/typographic, drawn and three-dimensional means, such as how to tie a special kind of knot, make a mitre joint or correct faults in darkroom processing. These tasks normally required the student to learn something before attempting to explain it to someone else. In this sense, the tasks were real and related in content to the subject matter of the course. Proposals could be tried out and modified prior to specification and production in the studios and workshops. Specialist skills and knowledge were acquired in the process of doing the work, and continually reinforced.

First year tasks were never presented in terms of end-products, but as problems requiring resolution through written language and associated two- and three-dimensional aids to comprehension. A task had to be realistic in terms of the student's experience, the availability of relevant information and the production

capacity of the department, complemented as necessary by local typesetters, process engravers, joiners, metal workers etc. A task such as redesigning the map of the London Underground system, which I recently saw a student attempting, would not have been seen as educationally sensible.

When creating the text of a first year project was not part of the student's task, it would be dictated so as not to rob the student of the experience of checking for accuracy and of sorting as a basic preliminary to design practice.

First year work was normally group-based to permit a variety of solutions to the same problem, thus allowing discussion and trials of various approaches to be carried out. This would cause a number of common theoretical problems to be thrown up, and referred to again at some other time. The need to develop skills in drawing and photography was an in-built part of first year design tasks, not taught separately.

After the first year or so, the print production workshops were gradually treated as a black box into which specifications were posted and proofs received and corrected by the author-typographer before being passed for production. Workshop staff were trained not to 'sole and heel' leaky specifications, but to 'return to sender' with ambiguities marked. Or to 'follow copy' (through the window if necessary!). Passing messages via an internal phone-line between studios and workshops was also part of learning to make matters clear.

The need for accuracy in specifications as between studios and workshops eased the path to the rigours of instructing a machine by way of algorithms, which we began to do in the late 'sixties. This work included page design involving the programmed solution of such problems as reluctant widows at page turnover points. In using the computer for automatic page assembly, the pressing of 'make it fit' buttons, or the equivalent, was deemed an offence against

linguistic and professional integrity.

Although the first computer to which we had access was the size of a small room, had valve-operated logic gates, a miniscule memory and output in the form of an all-cap character set on continuous paper, our interest lay in making the monster do our bidding whilst thinking what future typographers would need to know if automated systems were not to be run on rules culled from the office Rule of Thumb Book where, amongst other nasty things, intervals on both axes of space tend to be treated cavalierly as mere gaps between things to be opened or closed up for no reason other than to make it fit in the manner of the feet of Cinderella's ugly sisters. As things have turned out, the users of software for desktop publishing, who in general are not typographers, tend, as typists did, to fall back on hand-me-down aesthetics which may have little relevance to the planning of today's more complex documents and which can work in opposition to their rational presentation.

One of the pleasures of today's new fangled means must be the ease with which alternative choices may be set out systematically, which previously was a laborious task. On the other hand, a deprivation in training now is the disappearance of spaces as tangible objects having physicality precisely specifiable in human-scale units of measurement, and without which nothing can be grouped rationally. Out of sight can too readily become out of mind.

Although the planning of complex work for print production required students to be concerned with clarity in the typographic matching of structure above sentence level, concern for clear articulation at alphabet level was not ignored. Though the staff was proficient in 'lettering' as taught in art schools using traditional tools and materials, its approach to teaching the subject had less to do with style than with unit construction. This theme ran through the work of designing at every level of a text; (except that,

in the case of the letter, its parts have no linguistic significance as such). Here at least the relationship between parts is purely abstract, the parts being fewer and more simple than the letterforms they combine to make, and with combinatorial potential much greater than the limited set of combinations needed for an alphabet.

In brief, study of letterforms was directed to asking the student to consider what attributes a collection of simple-to-make-therefore-easy-to-remember 'letters' would need (and would need to avoid) in order to function effectively as an alphabet; and so to examine characters based on the roman model in these terms. We had no answers up our sleeves.

Legibility was not regarded as being confined to letter and word level in the hierarchical construction of written language, but seen as a necessary attribute at every level of order, from the principal divisions of the whole work, down to the parts which come together to make a character. Taken altogether, that is what we understood by having regard for the needs of the reader, irrespective of the style in which it is achieved or the purpose to which an artefact is put.

A source of sustenance and education from which we greatly benefited during the 1960s and 70s were the forms of self-help organised from the grass-roots by teachers, practitioners and representatives of industry. This included national conferences on designing as a general concept, such as the Design Method Symposium organised by the Design and Innovation Group in London in 1962 and at Birmingham University in 1965.

One such self-help organisation was the independent Working Party on Typographic Teaching, started in 1966 on the initiative of the late Ernst Hoch. Another of special interest to typography students, teachers and practitioners was the Typographers' Computing Working

Group, sponsored jointly by the Society of Typographic Designers and the Society of Industrial Artists and Designers (now the Chartered Institute of Designers), set up in 1965 to look into the relationship between design practice and new developments in information processing and in printing generally, and chaired by Maurice Goldring.

An outcome of the conferences, seminars and study groups originated by the WPTT and TCWG was the emergence of what we began to call information design, an area of study and practice different in emphasis from traditional graphic arts practice and training, especially in its focus on typolinguistics as a design discipline, and in its cross-disciplinary character, including traditional concern for craftsmanship and awareness of the essentially visual character of the written/printed/computer-generated mode of the language.

I have ridden rough-shod over decades and touched fleetingly on some aspects of typography teaching at a time when a venerable technology was giving way to new fangled means which now, thirty years on, are still in a state of flux. Whatever the future holds by way of further technological change – and I hear from California that the future is paper – the intrinsic structure of the language, the 'raw' material of typography, will be the same. This being so, and as an educationalist, I would have to say that the prime attribute for practice as a typographer must be literacy and for which skill in mouse pushing is no substitute.

References

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One of the most informative records and insights of any design course is the work the students were asked to do and their responses to it. The rest of this paper shows examples of student work at Stafford in the 1960s and 70s.

Figure 1

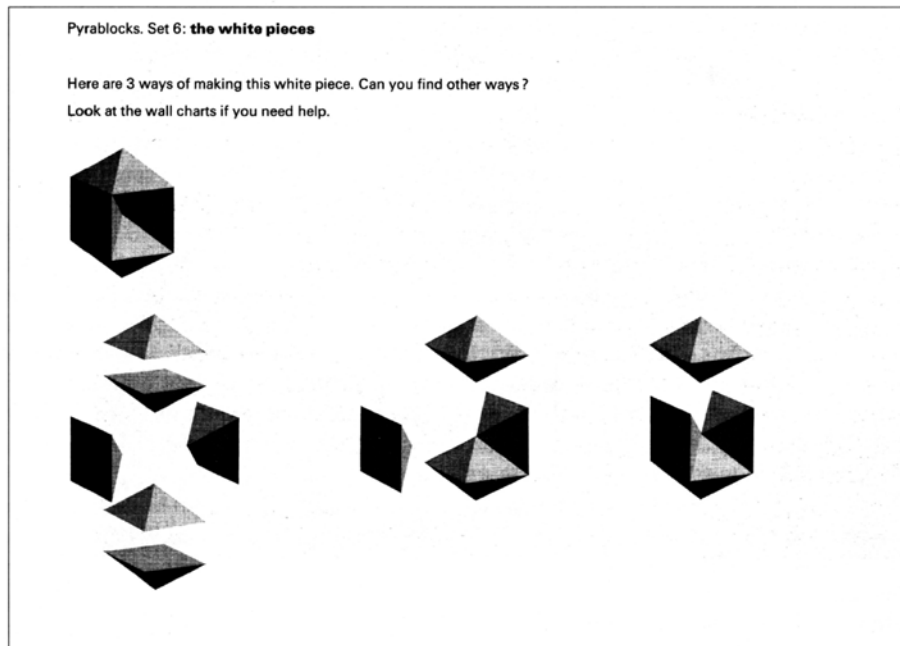
'Pyrablocks'

An aid to primary school mathematics teaching

Third year. 1972–3

This work was developed in association with primary school teachers of mathematics who were involved with 'Fletcher' new maths teaching in Staffordshire primary schools.

It consists of coloured wooden blocks using a square pyramid as the basic unit of construction, accompanied by A4 work cards and A3 wall charts. It is used to teach basic factorial concepts three-dimensionally to primary school children, the spatial manipulation of ideas being a feature of the learning process. The base of the pyramid was 50 × 50 mm. Group work leader: Roger Davies



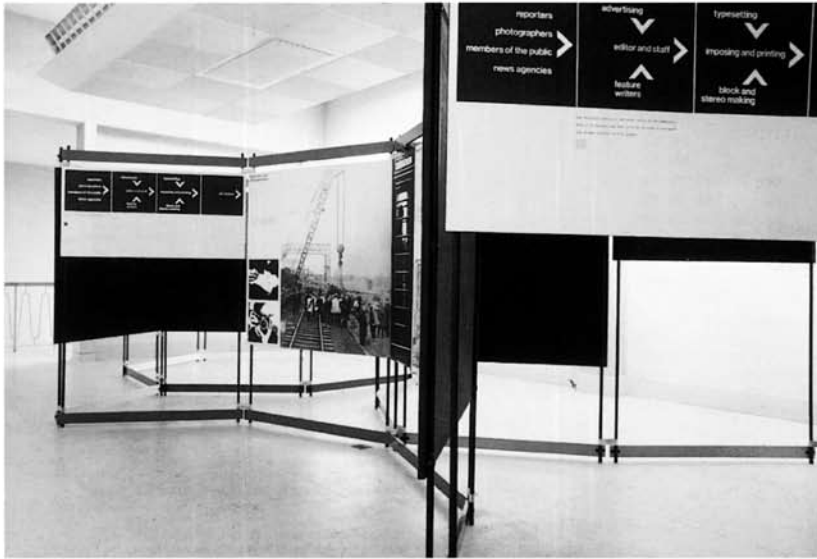
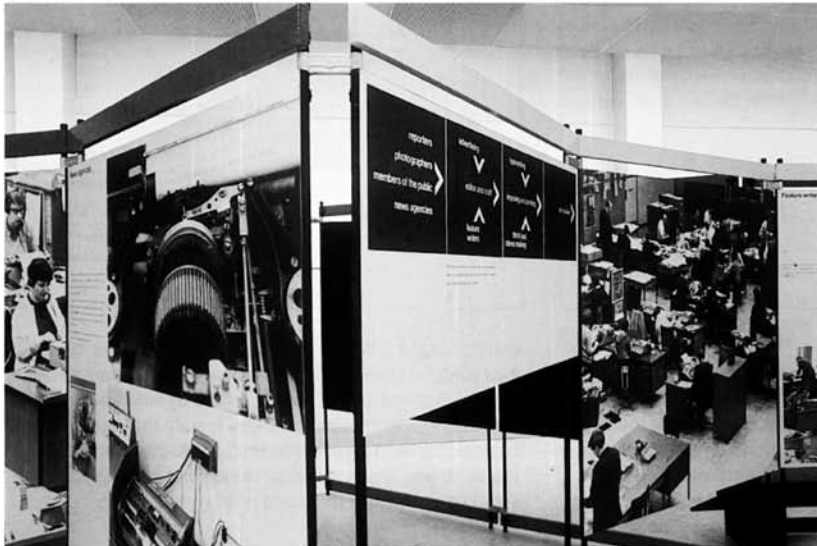


Figure 2
Exhibition design
First year. 1968

A free-standing, readily dismantled and re-erected travelling exhibition designed for a group of local news papers. It tells how a newspaper is made from news gathering to final delivery by the paper boy.

Constructed of 27, 4 x 4 foot boards; photographs and enlarged tyewritten text written by the student group.



HOW TO TIE THE EPANKYLOTOS BROKHOS.

Read the instructions carefully before commencing.

Place the cord across the palm of the left hand between the thumb and forefinger.

Allow at least twelve inches to hang over the back of the hand.

Wrap the other part of the cord around the back of the hand, over the thumb and across the palm.

Grip it firmly between the little finger and the adjacent finger.

Holding the left hand flat and, using the right hand,

pass the loop nearest the wrist under the other loop.

Holding the first loop tightly pull, both loops off the hand.

The two loops should then form.

One will be in the left hand,

the other in the right hand.

These loops should have a running knot between them

so that when the ends of the cord are pulled

the loops decrease in size.

E Brown 1st year 1970

How to tie the Epankylotos Brokhos.

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Holding the first loop tightly, pull both loops off the hand.

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the loops decrease in size.

Figure 3

How to tie the Epankylotos Brokhos

First year. 1970

First and final stage in a five-stage development following the student's handwritten instructions on the stages to be followed in tying a knot used by the ancient Greeks for holding a patient to an operating table. The English translation was first read out, then drafted many times by each

student in the group until it could be understood. It was the typed and specified for machine composition. Finally, the spacing was altered on the stone by workshop staff following students' specification. It went through several stages of proofing, proof-reading and finally, printing. The work was repeated using drawn and photographic sequences to show the process of tying the knot.

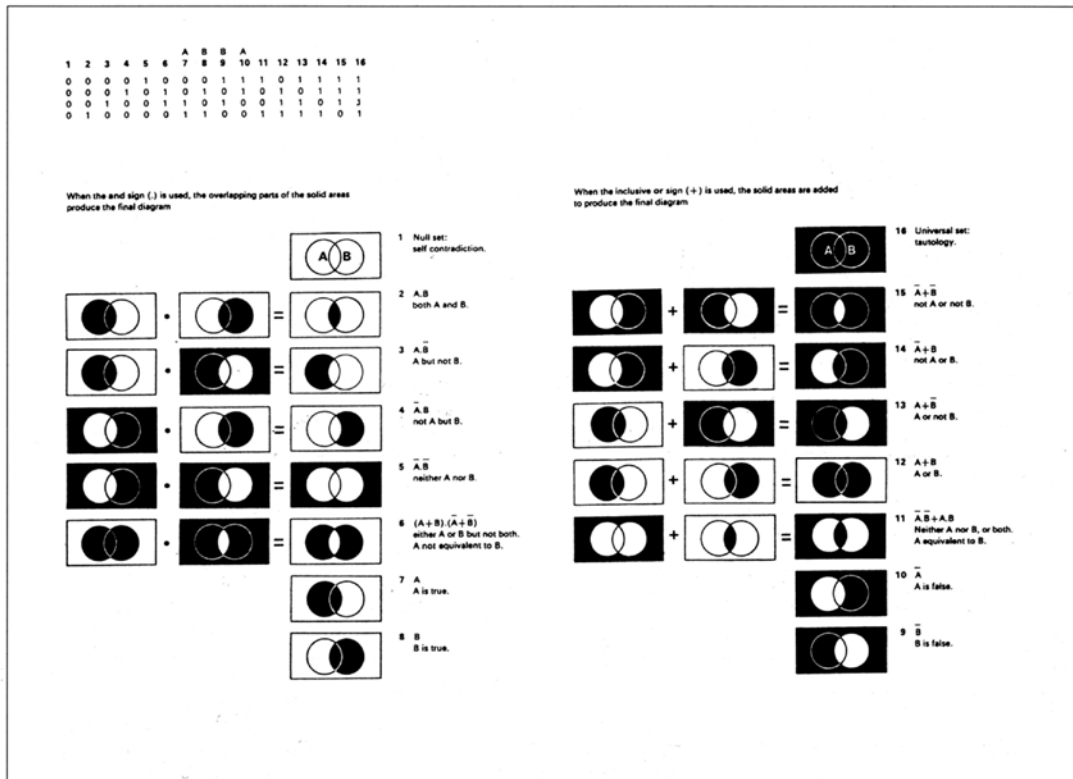


Figure 6

Visual aid

Second year. 1970

After having been introduced to the rudiments of symbolic logic, the group was asked to design and specify for production, or make three-dimensionally, something that could be used to demonstrate the operation of Venn diagrams using two variables. This solution, which involved the making of artwork for block making, was produced in quantity for use in the Department of Maths and Computing of a local technical college.

Student: Edd Brown

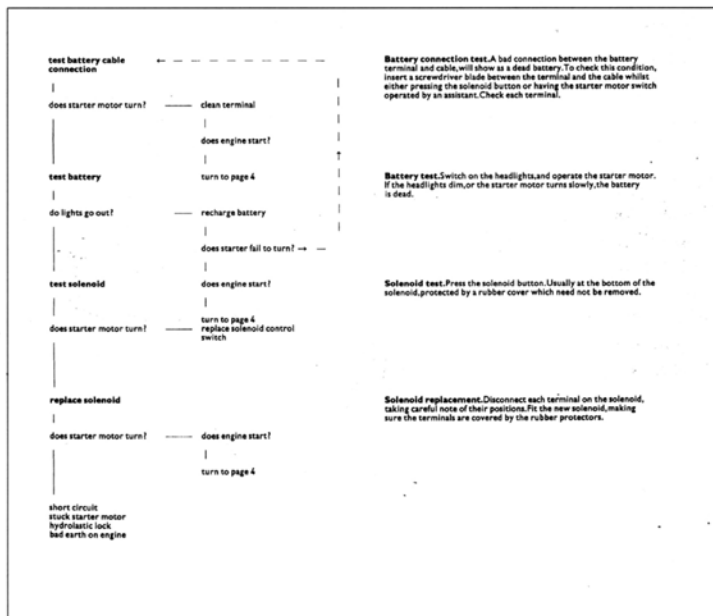
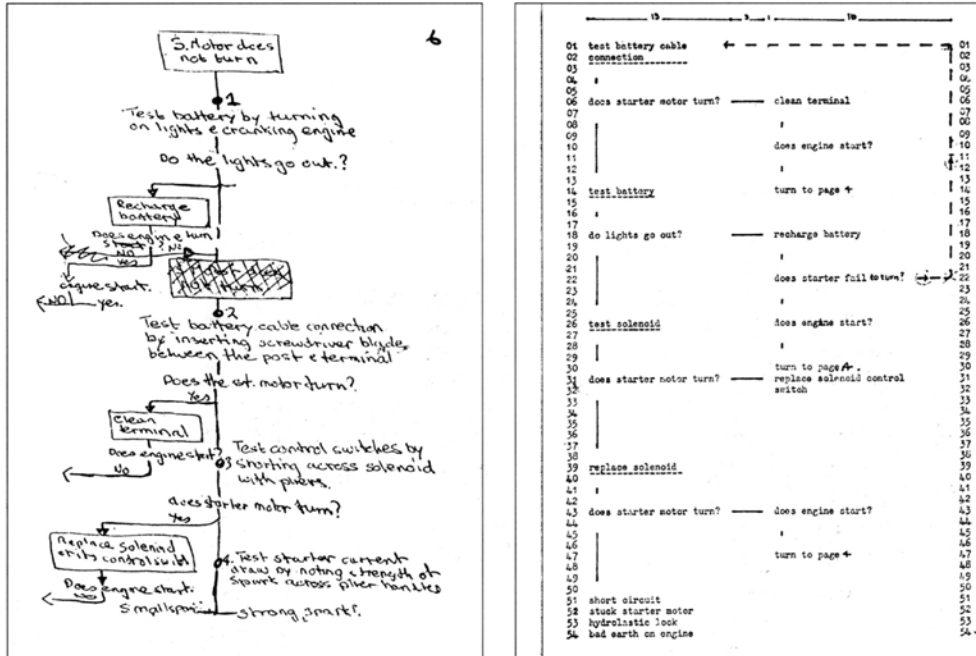


Figure 7
Preliminary work and a page from motor car starting troubles: a 12-page fault-finding chart *Second year, 1968*
This job was written and specified for Monotype machine composition. It was keyboarded and cast at the Birmingham School of Printing from the student's type-written specification.
Student: Michael Woodhams

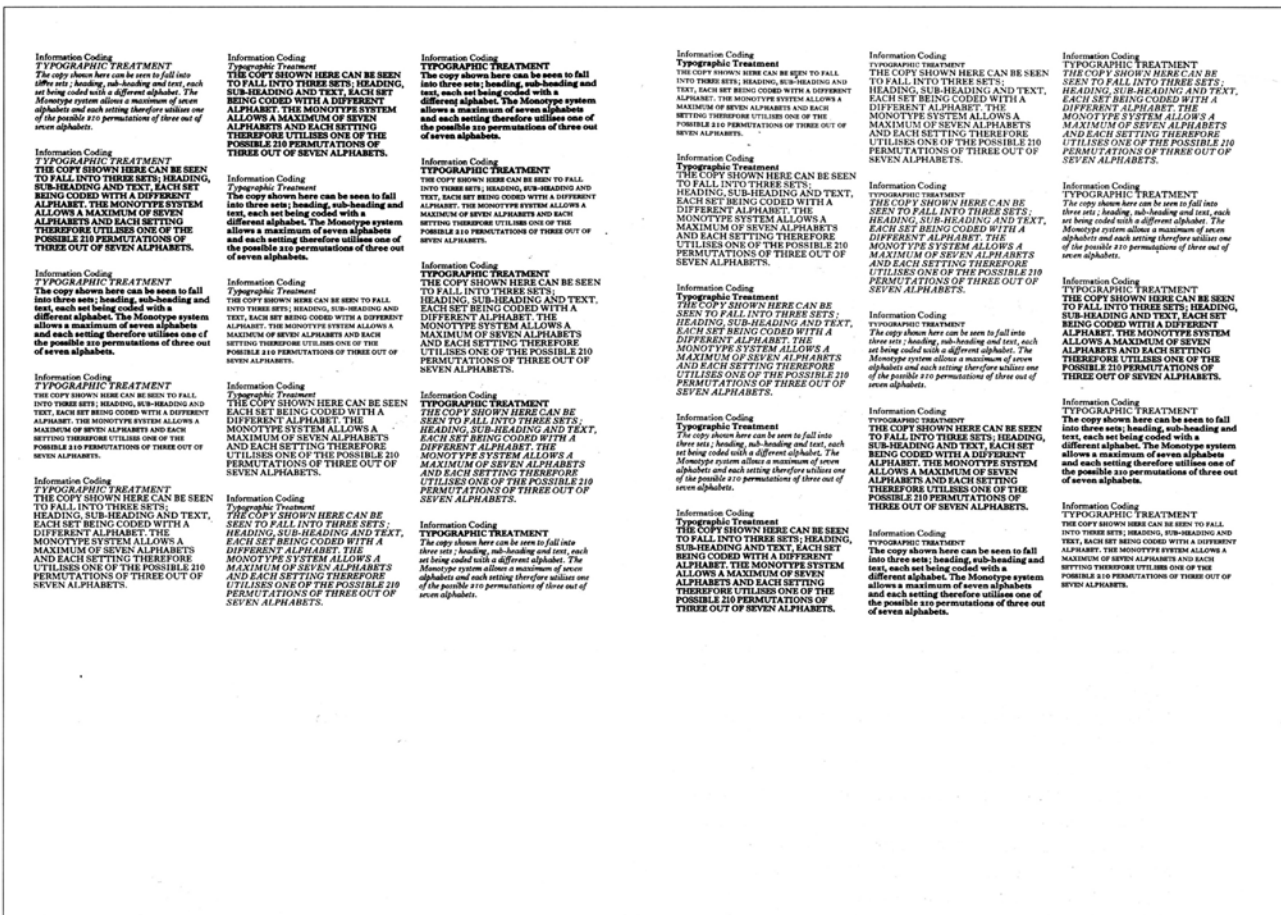


Figure 11
Information coding
Second year, 1969

All design operations involve choosing between available alternatives. Uncertainty about what to choose increases rapidly as the number of alternatives grows. Beyond a certain point it becomes impossible to hold in the head all the possibilities, let alone know which combinations are best in relation to a given object. At this point combinatorial mathematics can help to set out some or all of the alternatives, not to produce design solutions, but to enable us to see the problem more clearly.

In typographic design the Monotype system of character assembly offers a wide range of choices for the visual cod-

ing of different classes of information, perhaps too wide for most purposes. For one size of type there can be as many as seven visually different categories from which to select and combine in the task of structuring language in ways which make sense: roman capitals, roman lower case, italic capitals, italic lower case, bold capitals, bold lower case and small capitals.

This example is a page from a student-designed book to set out all 210 choices available when any three of seven alphabets are explored systematically. The work is not intended to demonstrate the best choice for the piece of copy selected, nor does it take into account word space or line space. It is designed merely as an aid to making choices in typography and to act as a pointer to some problems.

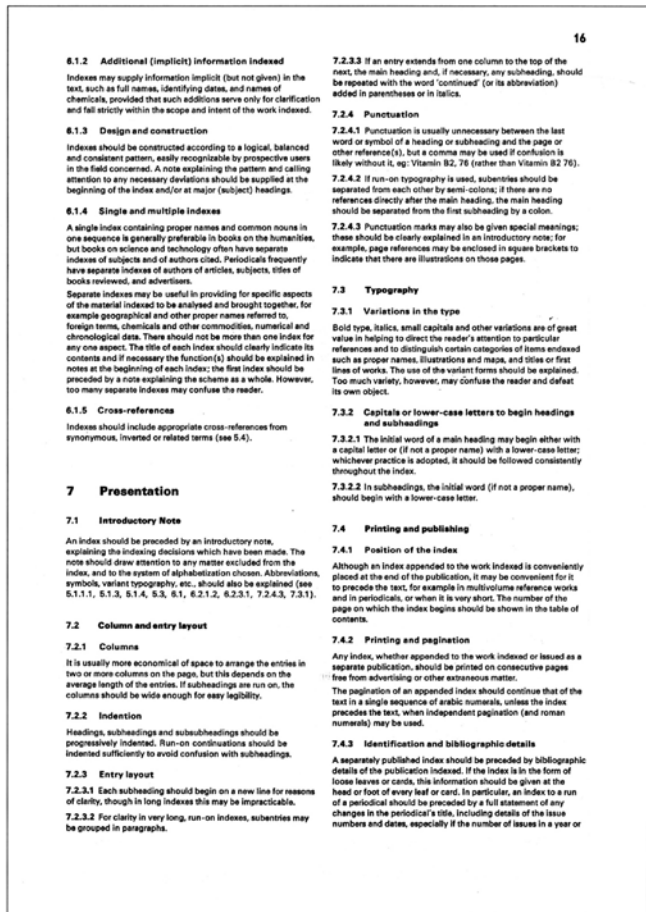


Figure 13
Numerically-encoded text
1977

First and last stage of a sixteen-stage development of a page of numerically-encoded information.
Students: Sandy Banks and Bert Aureli (formerly students at The University of Reading in the Department of Typography & Graphic Communication)

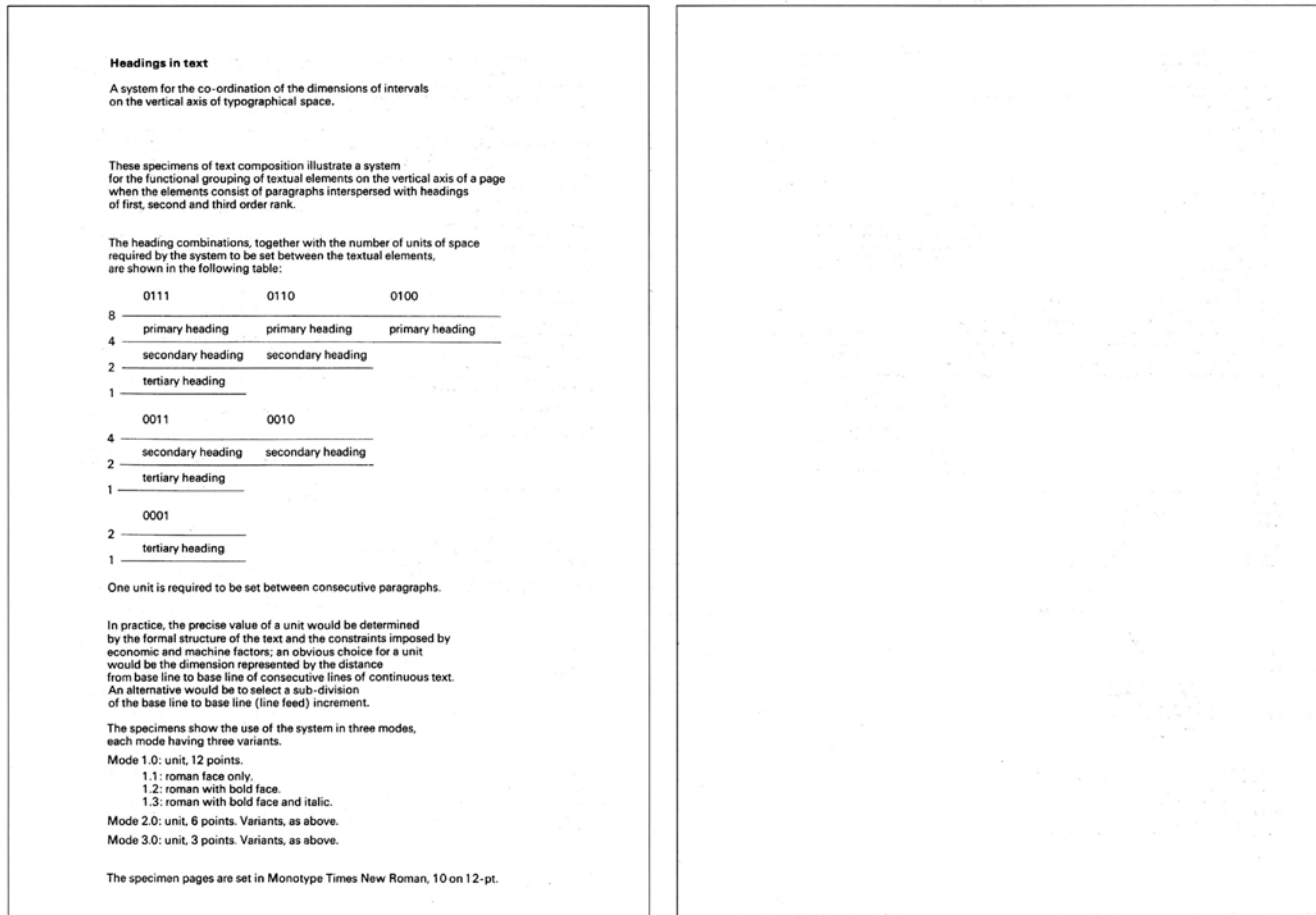


Figure 14
 Headings in text
First year. 1970

Two pages from a 36-page specimen book illustrating a system designed by first-year students for the co-ordination of intervals on the vertical axis of the page. This project was a necessary preliminary to work on the design of rules for computer-assisted page editing. The system requires the standardisation of intervals between textual elements and the abandonment of the traditional practice of vertical justification in the composition of pages.
 Students: Deborah Hildred, Pat Thorley and Andrew Smithers

Stafford College of Further Education, Department of Design
 Project page editing
 Text analysis and allocation of y-axis space
 Textual elements
 h1 a primary heading
 h2 a secondary heading
 h3 a tertiary heading
 p1 a paragraph preceding h1
 p2 a paragraph preceding h2
 p3 a paragraph preceding h3
 p4 a paragraph preceding another paragraph
 Allocation of units of space following textual elements

| elements | units | | | | coding | | | |
|----------|-------|---|---|---|--------|---|---|---|
| | 8 | 4 | 2 | 1 | 0 | 1 | 0 | 0 |
| h1 | | | | | 0 | 1 | 0 | 0 |
| h2 | | | | | 0 | 0 | 1 | 0 |
| h3 | | | | | 0 | 0 | 0 | 1 |
| p1 | | | | | 1 | 0 | 0 | 0 |
| p2 | | | | | 0 | 1 | 0 | 0 |
| p3 | | | | | 0 | 0 | 1 | 0 |
| p4 | | | | | 0 | 0 | 0 | 1 |
| subsets | | | | | 1 | 1 | 1 | 1 |
| p1 h1 | | | | | 1 | 1 | 1 | 0 |
| p1 h2 | | | | | 1 | 1 | 1 | 0 |
| p1 h3 | | | | | 1 | 1 | 1 | 0 |
| p2 h1 | | | | | 0 | 1 | 1 | 1 |
| p2 h2 | | | | | 0 | 1 | 1 | 0 |
| p2 h3 | | | | | 0 | 0 | 1 | 1 |
| p3 h1 | | | | | 0 | 0 | 1 | 1 |
| p3 h2 | | | | | 0 | 0 | 0 | 1 |

15a

Stafford College of Further Education, Department of Design
 Project page editing
 Text analysis and allocation of y-axis space
 Textual elements
 h1 a primary heading
 h2 a secondary heading
 h3 a tertiary heading
 p1 a paragraph preceding h1
 p2 a paragraph preceding h2
 p3 a paragraph preceding h3
 p4 a paragraph preceding another paragraph
 Allocation of units of space following textual elements

| elements | units | | | | coding | | | |
|----------|-------|---|---|---|--------|---|---|---|
| | 8 | 4 | 2 | 1 | 0 | 1 | 0 | 0 |
| h1 | | | | | 0 | 1 | 0 | 0 |
| h2 | | | | | 0 | 0 | 1 | 0 |
| h3 | | | | | 0 | 0 | 0 | 1 |
| p1 | | | | | 1 | 0 | 0 | 0 |
| p2 | | | | | 0 | 1 | 0 | 0 |
| p3 | | | | | 0 | 0 | 1 | 0 |
| p4 | | | | | 0 | 0 | 0 | 1 |
| subsets | | | | | 1 | 1 | 1 | 1 |
| p1 h1 | | | | | 1 | 1 | 1 | 0 |
| p1 h2 | | | | | 1 | 1 | 1 | 0 |
| p1 h3 | | | | | 1 | 1 | 1 | 0 |
| p2 h1 | | | | | 0 | 1 | 1 | 1 |
| p2 h2 | | | | | 0 | 1 | 1 | 0 |
| p2 h3 | | | | | 0 | 0 | 1 | 1 |
| p3 h1 | | | | | 0 | 0 | 1 | 1 |
| p3 h2 | | | | | 0 | 0 | 0 | 1 |

15b

Figures 15a-g

Y-axis spacing system

First year. 1970

The content of this text is taken from a first year analysis of headings in text reported in *The Journal of Typographic Research*, Autumn, 1970. The systematic spatial development shown here follows a system for the functional grouping of hierarchically related parts, as described in the text for headings, though the principle has general application. Needless to say, this requires attention to what is actually being said. The line spacing is based on a binary development of the baseline to baseline dimension of the norm which has been decided for continuous text.

Stafford College of Further Education, Design Department

Project page editing

Text analysis and allocation of y-axis space

Textual elements

h1 a primary heading

h2 a secondary heading

h3 a tertiary heading

p1 a paragraph preceding h1

p2 a paragraph preceding h2

p3 a paragraph preceding h3

p4 a paragraph preceding another paragraph

Allocation of units of space following textual elements

| | units | | | | coding | | | |
|----------|-------|----|----|---|--------|---|---|---|
| | 8 | 4 | 2 | 1 | | | | |
| elements | | | | | | | | |
| | h1 | | | | 0 | 1 | 0 | 0 |
| | h2 | | | | 0 | 0 | 1 | 0 |
| | h3 | | | | 0 | 0 | 0 | 1 |
| | p1 | | | | 1 | 0 | 0 | 0 |
| | p2 | | | | 0 | 1 | 0 | 0 |
| | p3 | | | | 0 | 0 | 1 | 0 |
| | p4 | | | | 0 | 0 | 0 | 1 |
| subsets | p1 h1 | h2 | h3 | | 1 | 1 | 1 | 1 |
| | p1 h1 | h2 | | | 1 | 1 | 1 | 0 |
| | p1 h1 | | | | 1 | 1 | 0 | 0 |
| | p2 h2 | h3 | | | 0 | 1 | 1 | 1 |
| | p2 h2 | | | | 0 | 1 | 1 | 0 |
| | p3 h3 | | | | 0 | 0 | 1 | 1 |
| | p4 | | | | 0 | 0 | 0 | 1 |

15c

Stafford College of Further Education, Design Department

Project page editing

Text analysis and allocation of y-axis space

Textual elements

h1 a primary heading

h2 a secondary heading

h3 a tertiary heading

p1 a paragraph preceding h1

p2 a paragraph preceding h2

p3 a paragraph preceding h3

p4 a paragraph preceding another paragraph

Allocation of units of space following textual elements

| | units | | | | coding | | | |
|----------|-------|----|----|---|--------|---|---|---|
| | 8 | 4 | 2 | 1 | | | | |
| elements | | | | | | | | |
| | h1 | | | | 0 | 1 | 0 | 0 |
| | h2 | | | | 0 | 0 | 1 | 0 |
| | h3 | | | | 0 | 0 | 0 | 1 |
| | p1 | | | | 1 | 0 | 0 | 0 |
| | p2 | | | | 0 | 1 | 0 | 0 |
| | p3 | | | | 0 | 0 | 1 | 0 |
| | p4 | | | | 0 | 0 | 0 | 1 |
| subsets | p1 h1 | h2 | h3 | | 1 | 1 | 1 | 1 |
| | p1 h1 | h2 | | | 1 | 1 | 1 | 0 |
| | p1 h1 | | | | 1 | 1 | 0 | 0 |
| | p2 h2 | h3 | | | 0 | 1 | 1 | 1 |
| | p2 h2 | | | | 0 | 1 | 1 | 0 |
| | p3 h3 | | | | 0 | 0 | 1 | 1 |
| | p4 | | | | 0 | 0 | 0 | 1 |

15d

Stafford College of Further Education, Design Department

Project page editing

Text analysis and allocation of y-axis space

Textual elements

h1 a primary heading
 h2 a secondary heading
 h3 a tertiary heading
 p1 a paragraph preceding h1
 p2 a paragraph preceding h2
 p3 a paragraph preceding h3
 p4 a paragraph preceding another paragraph

allocation of units of space following textual elements

| | | units | | | | coding | | | |
|----------|-------|-------|---|---|---|--------|---|---|---|
| | | 8 | 4 | 2 | 1 | 8 | 4 | 2 | 1 |
| elements | h1 | 0 | 1 | 0 | 0 | | | | |
| | h2 | 0 | 0 | 1 | 0 | | | | |
| | h3 | 0 | 0 | 0 | 1 | | | | |
| | p1 | 1 | 0 | 0 | 0 | | | | |
| subsets | p2 | 0 | 1 | 0 | 0 | | | | |
| | p3 | 0 | 0 | 1 | 0 | | | | |
| | p4 | 0 | 0 | 0 | 1 | | | | |
| | p1 h1 | 1 | 1 | 1 | 1 | | | | |
| p1 h1 h2 | 1 | 1 | 1 | 0 | | | | | |
| p1 h1 h3 | 1 | 1 | 0 | 0 | | | | | |
| p2 h2 h3 | 0 | 1 | 1 | 1 | | | | | |
| p2 h2 | 0 | 1 | 1 | 0 | | | | | |
| p3 h3 | 0 | 0 | 1 | 1 | | | | | |
| p4 | 0 | 0 | 0 | 1 | | | | | |

15e

Stafford College of Further Education, Design Department

Project page editing

Text analysis and allocation of y-axis space

Textual elements

h1 a primary heading
 h2 a secondary heading
 h3 a tertiary heading
 p1 a paragraph preceding h1
 p2 a paragraph preceding h2
 p3 a paragraph preceding h3
 p4 a paragraph preceding another paragraph

Allocation of units of space following textual elements

| | | units | | | | coding | | | |
|----------|-------------|-------|---|---|---|--------|---|---|---|
| | | 8 | 4 | 2 | 1 | 8 | 4 | 2 | 1 |
| elements | h1 | 0 | 1 | 0 | 0 | | | | |
| | h2 | 0 | 0 | 1 | 0 | | | | |
| | h3 | 0 | 0 | 0 | 1 | | | | |
| | p1 | 1 | 0 | 0 | 0 | | | | |
| subsets | p2 | 0 | 1 | 0 | 0 | | | | |
| | p3 | 0 | 0 | 1 | 0 | | | | |
| | p4 | 0 | 0 | 0 | 1 | | | | |
| | p1 h1 h2 h3 | 1 | 1 | 1 | 1 | | | | |
| p1 h1 h2 | 1 | 1 | 1 | 0 | | | | | |
| p1 h1 h3 | 1 | 1 | 0 | 0 | | | | | |
| p2 h2 h3 | 0 | 1 | 1 | 1 | | | | | |
| p2 h2 | 0 | 1 | 1 | 0 | | | | | |
| p3 h3 | 0 | 0 | 1 | 1 | | | | | |
| p4 | 0 | 0 | 0 | 1 | | | | | |

15f

Stafford College of Further Education, Design Department

Project page editing

Text analysis and allocation of y-axis space

Textual elements

h1 a primary heading
h2 a secondary heading
h3 a tertiary heading

p1 a paragraph preceding h1
p2 a paragraph preceding h2
p3 a paragraph preceding h3
p4 a paragraph preceding another paragraph

Allocation of units of space following textual elements

| | units | coding |
|----------|-------------|---------|
| | 8 4 2 1 | |
| elements | h1 | 0 1 0 0 |
| | h2 | 0 0 1 0 |
| | h3 | 0 0 0 1 |
| p1 | | 1 0 0 0 |
| | p2 | 0 1 0 0 |
| | p3 | 0 0 1 0 |
| | p4 | 0 0 0 1 |
| subsets | p1 h1 h2 h3 | 1 1 1 1 |
| | p1 h1 h2 | 1 1 1 0 |
| | p1 h1 | 1 1 0 0 |
| | p2 h2 h3 | 0 1 1 1 |
| | p2 h2 | 0 1 1 0 |
| | p3 h3 | 0 0 1 1 |
| | p4 | 0 0 0 1 |

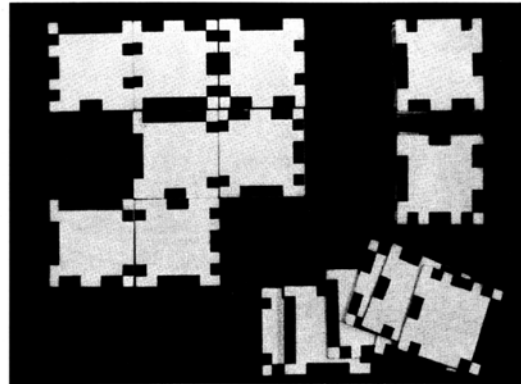


Figure 16

A game of solitaire

Second year. 1968

Thirty-five cards are required to be arranged in a
5 × 7 rectangle with all edges matching.

Student: John Paish

| Department of Engineering | |
|--|--|
| Head of Department: W A Kendrick BSc Cert Ed Room A1 | |
| Full-time Day Courses | |
| ■ Electrical and Electronic Engineering Craft Studies Course | |
| Part II C & G 511 | |
| This is a two year course leading to an examination of the City & Guilds of London Institute taken at the end of the second year and replaces the Electrical Craft Practice Course Part II (C & G 347). Students admitted must have satisfactorily completed either Part I of the Electrical Craft Practice Course or the Basic Engineering Craft Studies Part I (C & G 500) Electrical Bias Course. | |
| First Year | Tutor: E A Campbell Course Symbol DECS1 |
| class | day time room subject |
| 49113 | Mon 9-10½ 231 Electrical Principles |
| 49123 | Mon 11-12½ L10 Associated Studies |
| 49133 | Mon 14-34 120 Liberal Studies |
| 49143 | Mon 34-54 230 Electrical Plant Manufacture |
| or | |
| 49153 | Mon 34-54 231 Electrical Plant Utilisation |
| 49163 | Mon 6-8½ E5/E2 Project Work |
| Second Year | Tutor: E A Campbell Course Symbol DECS2 |
| class | day time room subject |
| 49303 | Tues 9-11 231 Electrical Plant Utilisation |
| or | |
| 49313 | Tues 9-11 227 Electrical Plant Manufacture |
| 49323 | Tues 11½-12½ E5/E2 Project Work |
| 49323 | Tues 14-24 E5/E2 Project Work |
| 49333 | Tues 3-4½ 227 Electrical Principles |
| 49343 | Tues 5½-6½ L38 Associated Studies |
| 49353 | Tues 6½-8½ L38 Liberal Studies |
| Part III C & G 619 | |
| This is a one-year course supplementary to the Part II course. The City & Guilds of London Institute is giving consideration to the recognition of success in both Part II and Part III so that an equivalent of the Full Technological Certificate can be awarded. | |
| Students must have satisfactorily completed the Part II of an appropriate Craft Course before commencing the Part III course. | |
| Tutor: G A Bonell Course Symbol DECS3 | |
| class | day time room subject |
| 49512 | Mon 9-10½ 229 Electrical Plant and Equipment Testing |
| 49522 | Mon 11-12½ L24 Electronic Components and Circuitry |
| 49532 | Mon 14-34 230 Meters, Instruments and Relays |
| 49542 | Mon 34-54 C4 Associated Studies |
| 49552 | Mon 6-7 229 Liberal Studies |
| ■ Ordinary National Certificate Course | |
| First Year | see pages 93 and 94 |
| Full time from 20 Dec 1971 to 29 March 1972. This course includes attendance on one evening per week from 20 Sept to 13 Dec 1971, and from 10 April to 22 May 1972. Christmas vacation 24 and 27 Dec 1971. | |
| Group A | For students who have satisfactorily completed the General Course and obtained a Credit in Mathematics, a Credit in Engineering Science and a pass in Engineering Drawing or Workshop Processes and Materials. |

Figure 17
College prospectus
Third year. 1971

This shows a page proof from the Stafford College prospectus. The student specified and marked up typed copy which was then set in continuous galley form. He then marked page breaks at appropriate points: the page depth was allowed to vary, but no arbitrary changes could be made to increments of space on the vertical axis. All maps, diagrams etc contained in the work were measured in units of line feed in the vertical dimension, the width being allowed to vary within the limits of the overall measure. This is contrary to the normal practice of stating the width of such items whilst allowing the depth to vary if one or the other has to be stated. The structural analysis of the job required a diagram of some 2 × 12 feet.
Student: Edd Brown