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The Apple Macintosh:

Its effect on Graphic Design and the Graphic Designer

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Introduction

This thesis examines the revolution currently taking place in the world of graphic design, a revolution in which the Apple Macintosh plays a major role. Although IBM and other computer manufacturing companies produce computers with similar graphic facilities to those of the Apple Macintosh, none of these can claim to equal the level of sophistication of the Macintosh. For this reason, this thesis takes the Macintosh as its vehicle for discussion, although the majority of issues discussed apply to any computer systems which offer similar facilities.

Typography is the area of design most affected by the introduction of the Mac. Although the most popular software available for the Macintosh includes programmes which allow for the inclusion of images and text on the same page, it is control over the typographical aspect of design which the Mac has changed most profoundly, and so typography is the aspect of design which will be dealt with almost exclusively.

This thesis attempts to place the Macintosh in its historical context by drawing parallels between it and other equally revolutionary developments in the world of communications. The idea of new technologies imitating old is discussed, examining how the terminology is borrowed from an archaic technology and applied to a new one.

The practicalities involved in using the Macintosh are dealt with, looking at how it closely mimics a typical office environment, making the computer easy to use. However, the ease-of-use of the Macintosh, or user-friendliness has some disadvantages. The desk-top publishing revolution has brought the costs of publishing down to a level where it is now affordable for small businesses. Unfortunately, owning a machine as sophisticated as the Macintosh does not automatically produce, in design terms 'good results'. The significance of the desk top publishing revolution is discussed in detail, asking questions about its long term effect on design and designers.

Creativity, an unknown process, is analyzed, with regard to how it is affected by the Mac, or rather, the user's relationship and attitude towards it. Ignorance and lack of understanding are important factors determining much of what is produced by first-time users of the Macintosh. We are currently witnessing the early stages of the development of the Macintosh, and it is at this stage that the more unusual and interesting results occur.

The apparently limitless facilities afforded us by the Macintosh initially have a very strong effect on the average user. Functions that would previously have taken hours of tedious figuring out, are performed in seconds. This gives the user a false sense of power, which makes him/her blind to the real capabilities of the Macintosh. People such as designer Zuzana Licko and mathematician Donald Knuth have explored the potential of the Macintosh in different ways. Their work is examined, and the lessons to be learnt from their work are made evident. The real potential of the Macintosh remains masked until the user gains enough experience to realise that many of the apparently remarkable feats performed on the Macintosh are in fact of little use in day-to-day design. Only then can he or she come to terms with the possibility of re-assessment and re-evaluation of what is good design. The language of design is being changed because we are suddenly being offered possibilities and options that were previously un-

available. Our vocabulary is being expanded, and we must work to find the grammar that will help give meaning to this new vocabulary

Chapter 1

'Letters are things, not pictures of things'. (Eric Gill)

In 1946, the first programmable computer, ENIAC, was invented. In 1972, the phrase 'personal computer' was coined. In 1984, the Apple Macintosh was introduced.

Despite the aura of post-modernism which surrounds the Apple Mac, the technological crevasse implied by the physical differences between these two machines, (ENIAC and the Mac), as Ronald Labuz wrote, in <u>Typograph</u> <u>Typesetting</u>: 'Despite its 18,000 vacuum tubes and unwieldy size, ENIAC was based on the same technological theory that applies to the new IBM PC or Apple Macintosh.' (20),p.156

Without software, the Mac, or any computer for that matter, is useless. Software is what makes the computer intelligent. The range of software available for the Mac includes more than page-make-up, or typemanipulation programmes. The Macintosh is, for many people, no more than a very efficient administration tool, or a word processor. For others, it is a general office 'organiser', performing only the mundane aspects of business management. It is important to note, however, that there are not many computers which can perform the specialized tasks normally carried out by the designer. The Mac is one of the very few which can. What gives the Macintosh this ability? Although the Mac is of course a very highly developed computer, it is not just development and improvement which makes the Mac

so unique. There is a special ingredient, a computer language which is at the core of every facility available on the Mac. This language is called 'POSTSCRIPT'. It enables typography and illustrations to be manipulated side by side on a page, and outputted together to the same printing device. How the Postscript language works is irrelevant to most users of the Mac. What is important is what it does. This will be discussed in a later chapter. The linking of the Mac, the Postscript language, and a third character in this revolution, the Apple LaserWriter printer, makes the computer graphics revolution a reality.

The user-friendliness of the Macintosh is another reason for its runaway success; the virtues of the Mac lie mainly in this user-friendliness, or so say Apple. Hidden behind the glib copy of this ad (fig.1) is one of the secrets of the Mac's success: '... it uses symbols we're all familiar with, like wastebaskets and files...', user-friendliness. By mimicking the typical human environment, it makes us feel at home. Also in this ad, this time in the photograph, is the other 'human' aspect of the Mac, the 'mouse' (fig.2). Ideal for nontypists, movement of the mouse, and the use of a simple button on the top, enables the user to do everything with the Mac (except where the inputting of copy is involved). The mouse makes the popular image of the computer wizard tapping furiously at the keyboard seem positively old-fashioned. It also helps the novice to come to grips with the Mac. Although pressing certain keys can be a convenient alternative to pulling down menus and selecting items with the mouse (fig.2), the keyboard is mainly used for inputting text (which would be done by a trained typist just as on a word-processor) (fig. 3)

'Printing and publishing area a \$100 billion industry in the United States.

Indeed, they are the third largest corporate expense today, exceeded only by capital and labour expenditure.' (28),p.112

When you consider that one of the most versatile and popular tools of the printing and publishing industry (including design) is the Macintosh, its relevance to today's world is quickly understood. From the layman's point of view then, the Mac is merely a short cut and time saver. What a shame it would be if this were its only value. Years of research, millions of dollars spent, countless man-hours clocked up, with the result that we simply save some time. But the time saving aspect, though important, is a fraction of the whole story.

From the graphic designers point of view, the Mac offers absolute control, and almost unlimited possibilities in terms of type manipulation and design. The significance of these aspects of the Macintosh is the modern day equivalent of the invention of movable type. The Mac opens up new channels of communication, just as Gutenberg did. While the actual setting of movable type was slower than writing, it was the idea of mass production that was important. Similarly, communication networks are expanded by the Macintosh, by giving the power for mass communication to people who never had it before, (which takes the form of desk-top publishing) and also the digitization of information makes it possible to send copy down a telephone line to the other side of the world within seconds.

Chapter 2

History of digital type & the Mac. (imitation + replacement)

There is one basic principle common to almost all major inventions. That is the imitation of its predecessor. It is slightly disturbing that such vast amounts of energy are invested in the creation of appliances or devices the measure of whose success is so often judged by how closely they imitate that which has gone before.

In 1944 John Logie Baird invented the television, an incredible achievement which, among other things, replaced the need to travel great distances in order to observe events. In 1876 Alexander Graham Bell invented the telephone, transmitting the words 'Mr. Wilson, come here, I want you!'. The telephone meant there was no need to wait for a reply to your letter. In 450 B.C. carrier pigeons were used for communication purposes between cities. This saved people having to walk great distances. The rules by which revolutionary technological developments are judged soon change from 1 - how well it imitates what it replaces to 2 - how each stage of development within that invention compares with the last. The innate characteristics of anything are quick to be noticed. There is always something in any new breakthrough which is not purely an imitation, but is unique to that thing itself. When a baby is born, we comment on how its looks compare to those of its parents, but quickly the child's own traits, characteristics and personality shine through.

The Mac is no different. There are jobs which the Mac replaces

extraordinarily well, going beyond mere imitation. The tedious but necessary preparation of finished artwork is something which the Mac is extremely capable of doing, simply by virtue of the fact that it is a computer. The Mac also does admirably well in its role as a vehicle for the designer's imagination, because of its ease of use and the almost infinite levels of control which it offers the designer. These are possibilities which have never before been available in any form. The Mac, though physically just one tool is in fact a huge range of tools many of which are almost entirely new. Humans find it hard to cope with novelty in this extreme, especially when they are forced to take it seriously, not like a ride at a funfair or a video game. When something this revolutionary appears it requires a great deal of common sense and understanding in order to get the most out of it. We are now in the transition period between viewing the Mac as a replacement tool, and appreciating it for the changes it can bring to the whole world of design.

The developments in fig. 4 all took place in the are of communication, the same field in which the Macintosh is making huge leaps forward.

Johann Gutenberg, a German goldsmith living in Mainz in the early 1400s, created an economical way of reproducing the looks of his day, only after ten years experimentation. His typographic style was heavily based on the typical handwriting of his time (fig. 5) simply because that's what the people were used to seeing. It is likely, that if he had produced a sort of type which would have been easier to manufacture and more suited to his primitive methods, that the revolutionary breakthrough would have been misunderstood and rejected. Richard Rubenstein wrote in <u>DigitalTypography</u>. 'What separated Gutenberg from his fellows was a knowledge of several enabling technologies that together gave birth to a new one'. (28, p.112)

The same principle of imitation is in practice in the development of the Mac. Indeed, even the language of letterpress which was begun by Gutenberg's methods has survived six centuries and is still used in the most sophisticated computer graphics systems. Words like uppercase, lowercase and leading, e.t.c, which had a meaning hundreds of years ago are irrelevant to the technology to which they are applied today. This demonstrates very well our reliance on imitation, the power of tradition, and a deep rooted unwillingness to leave the past behind, despite our manic race into the future (fig. 6).

Our technology is built to imitate reality, When printing was, (effectively), invented by Gutenberg, the reality he was imitating was handwritten words on paper. Since then, printing, and all the typefaces which have been designed to help us read more easily, have become our reality. Reality is filtered through each new piece of technology to see how it copes with it. On the face of it, this makes relatively little sense. An extreme example of this is a program created by a student at the media lab at M.I.T., USA. This is a program designed to imitate oriental brush drawings: 'I believe in the Elixir of Youth. I believe in the absolute Truth,' (5) remarks the screen that graduate student Steve Strassman is using to demonstrate his 'Brushes that Change' thesis project. Strassman has taught the computer to make Chinese/Japanese style 'sumi-e' ink drawings by modeling the behavior of ink and the individual bristles of the brush.

The accurate representation of something that vividly reflects all the awkward, passionate, emotive qualities that makes us human, by a computer is regarded as success. Does anyone dare ask this student why he designed this program? Wouldn't we be better off using a real brush? The same

argument can be applied to the reasoning behind photo-realist painting. Why? Can this technique do anything which the technique it imitates is not capable of?

Perhaps it is programs as sophisticated as these that will become part of our reality in five, or ten, or twenty years time. In the same way, the computerized versions of typefaces designed hundreds of years ago, e.g. Caslon, Bembo, Garamond. (fig.7) have become part of our reality today. Replacement according to some, must take place before innovation can begin in the area of computer graphics. And so the whole process that students like Steve Strassman is going through is, in some ways, necessary in the early stages of development. So we are in a transitional phase at the moment. The computer graphics revolution is like the child imitating its parents, (for old technologies together make new technologies) about to be influenced less by its parents and more by those around it with whom it has more in common. The next stage of development is the development of qualities unique to that child, which can only come about through imitation and learning.

Different aspects of the Macintosh are at different stages of developmentsome of its facilities are frighteningly new, others are gradually improving imitations of older technologies.

Chapter 3

User-friendliness

One of the major difficulties with all computers since they came into general use in large business was not cost, though this was prohibitive (and huge in comparison to today's prices), but the difficulty in using them. Since personal computers came into usage in the mid '70s, this problem became less serious, and the situation was improved still further by the development of the Macintosh. User-friendliness became the key, a phrase unheard of up to the early '70s. Few designers understood the potential of the future of the graphic computer. There are several factors involved in making the Macintosh as popular as it is today. These include affordability, compatibility between software packages, and, perhaps most importantly, its unique programming language, Postscript. 'Adobe's page description language, Postscript, with its capability to integrate images and text, has altered the role of computers in all aspects of graphics' 32 (p.44)

Postscript is the ingredient which has made this computer graphics revolution so important, Devised by a group of ex - Xerox employees, including John Warnock (now head of Adobe Systems), it has a dual role. First of all, as previously mentioned above, it enables text and pictures to be manipulated freely, allowing for any type of layout or composition of a page, and secondly, it describes fonts as outlines, enabling them to be successfully downloaded onto, and finally outputted by a laser printer. 'The Postscript page descrip-

tion is quite independent of the particular characteristics of the device that is being used to print the page, and the description can be rendered on any compatible output device using the devices maximum resolution.' (32),p.46.

One of the drawbacks of the Mac is the difference of, for example, a word in Times 64 point bold, on screen, and the same word, as output even on a low-resolution (300 dots per inch) printer. This phenomenon is referred to as what-you-see-is-what-you-get, or WYSIWIG (fig. 8) However, the Postscript language promises improvements in this area because of the unique capabilities of this language. Adobe systems inc., have recently introduced a facility called 'Type Manager' which greatly improves the on-screen resolution of type. Now what you see may not be what you get, but the difference between the two is considerably lessened. The significance of this language, according to Barry Smith in Graphics World of June '89, is such that 'In the long run, the language may become too important to remain proprietary to Adobe' (32)

The embryonic stage of the development which the Mac is at now necessitates a foresight and realization of the need for flexibility within the language which makes it special. The flexibility of Postscript as not merely a typographic, but a graphic tool, means it is not merely another transitional, temporary part of the development of the Mac. In fact, it is responsible for much of that development.

Chapter 4

Saving Time and Money

The enormous popularity of the Macintosh has much to do with Postscript, but this is of little concern to the average designer who just wants to get on with the job. There is an enormous range of software available (some of whose applications overlap) to the designer, or anyone for that matter, which can both dramatically cut down costs and provide greater possibilities for creative design. The time and cost saving features are, for many, the most attractive and this is often the reason for the initial purchase, for while time saved can readily be translated in money made- creative possibilities are less quantifiable.

Although the graphic design profession as we know it today has little history and less tradition, a tool such as the Mac, as well as simply making tools such as the set square and the rapidograph virtually redundant, can also make such everyday 'modern' tools of design seem little more important than museum pieces. As Muriel Cooper put it; 'The T-square and paste pot have literally disappeared from many graphic design studios'(8) The act of drawing a straight line with a ruler and pen may seem like a very mundane job, but it has taken us until now, (with computer technology) to perfect such a job. Add to this basic requirement a wide choice of pen thick-

nesses, tools for drawing right angles, circles, squares, rectangles, ovals, ellipses, with accuracy to thousandths of a millimetre and in the space of seconds, and several traditional tools are already made redundant. 'In this age of rapidly advancing graphic arts technologies, time saved -not necessity- is the mother of invention'

The time-consuming preparation of rough visuals for a client can be easily carried out with the Mac. Instead of offering five or six colour possibilities in the form of five or six separate roughs, the design can be drawn on screen, and colours changed while the client watches. With sophisticated colour monitors, the shade or tint of a colour can be changed by fractions so small as to be unnoticeable to the human eye. (fig.9) This 'while-you-wait' aspect of the designer-client relationship, although very flexible and convenient, has its disadvantages. Control over the design can be relinquished to the client, often with disastrous consequences. Once a client sees how easy it is to manipulate a design on-screen, he will begin to question the need to hire designers.

The transformation of client visual to finished artwork is now done with considerably more ease, and all the designer's typesetting can be done inhouse with absolute control over the size of each character to within .001 of a point. This level of control goes far beyond the needs of most designers except in the rarest instances, yet the fact that it is available means that it is irresistible.

Let us take a typical design job, and put it through this technology, using the relevant software. For example, a sixteen page brochure with black and white illustrations, and black and white, and colour photographs. First of all,

the copy can be typed into a word processing program such as MacWrite. (fig. 10) Incorporated into MacWrite is a spellchecker which not only checks the spelling of each word in the document but also makes suggestions for replacement words). A grid, once decided upon, can be set up in a graphics program, such as 'Ready Set Go (4.5)' or 'Quark Xpress' whose facilities share a lot of common ground. Almost all the features of an outside typesetting facility are contained in each of these programs. Headlines can be set, rules placed in exact positions, typefaces stretched or condensed to the required percentage (fig. 11). A potentially awkward situation might arise if, for example, a complex logo had to be redrawn, or altered in some way, and had to be included in this brochure. Adobe Illustrator 88 is the ideal program for this type of operation. The image is scanned in, (fig. 12) and it can be automatically drawn over, using the autotrace tool, or traced manually with the 'pen' tool (fig. 13). The use of Bézier curves (a mathematical way of producing curves of any type invented by the mathematician Bézier) is an extremely sophisticated yet easy-to-use method of drawing any conceivable shape. As shown in figure 14, points can be pulled at random until the desired shape is obtained.

When the image is finished, it can be transferred into 'RSG' or the 'QuarkXpress' program, (containing the remainder of the information) and placed in the desired place at the desire size. Once all the pages are complete, they can be output onto film, and delivered immediately to the printer. Separations of full colour photos or illustrations can be output also, saving money on what is normally a very costly process carried out by the printer. The resolution of laser printers normally found in the average design office is about 300 dpi (dots per inch)- an acceptable quality for client visuals, but not for finished art. For the latter, the disk containing the information is transferred to a bureau where output quality of up to 2400 dpi is available. The cost of machines of such high output quality is still high enough to be prohibitive to almost all agencies and constitution, making such bureaus necessary. Although the process of hiring an out-of-house service is strongly reminiscent of the process of sending out marked-up copy to a typesetter the control over the quality of the final product is placed firmly in the hands of the designer.

Chapter 5

Desktop Publishing

'Freedom of the press is guaranteed to anyone who owns one' - H. Leibling

Anyone who has ever had to draw a precise square in the exact centre of a piece of paper with a ruler and ink pen, and then neatly glue pieces of type at right angles to its base in an exact place as fast as possible, can appreciate and understand the Mac. Nearly everyone else, while not appreciating it, can enjoy it. It entices, seduces, invites and has never ending patience. Placing your hand on the mouse, (fig. 15) and pressing the button are the two actions which allow you to do almost anything. We marvel at its seductive capabilities, and it immediately wins our admiration and respect. Moving items about on screen is controlled directly by the movement of the mouse; where the mouse goes, so will the element on the screen.

This user-friendliness means that the basic commands can be learned in minutes, the more sophisticated ones in hours, and everything in less than a

day. Such an achievement gives the novice a feeling of well-being. This sense is a result of the prevalent stereotyped image of the 'mystery' of computers, a false idea , fed by science-fiction movies. The ease with which we overcome such a 'barrier' makes us all 'winners'. However, the secret (and there are seldom secrets hidden in the machinery) is not knowing how, but knowing why. The game of chess is a game that anyone with the strength and coordination to move the pieces can play. But the essence of the game is not playing, but playing <u>well</u>. This applies to the Mac. Moving items about the screen, setting type, including complex colour images is <u>design</u>, but it is not necessarily <u>good</u> design.

The Macintosh is the main cause of the fastest growing industries of the 80's; desk-top publishing. 'All kinds of people are now typesetting printed documents. Added to the traditional ranks of typographers and printers are writers, publishers, managers, children, engineers, architects, scientists, students, artists, reporters, and secretaries.'

The cost of the equipment required to set up a desk top publishing company has plummeted from £250,000 to about \$10,000 in three or four years. Low cost and ease of use are the two factors which make DTP a reality. DTP is seen by a lot of designers as a threat to their profession, Suddenly people without any education or training in design are producing designed documents. The DTP revolution operates in many areas, one of which is the office. Small-scale affordable publishing is now typeset where it was previously typewritten. Suddenly the choice between single and double spacing, or wide and narrow margins has expanded to include options which most of the Mac's DTP users never realised existed. As Paul McGrath put it in his article 'More is Worse'; 'It is assumed that reports prepared on the Mac look better simply because the equipment is better' (23), p.22. One almost

feels as though the Mac's inventors are playing a cruel joke, in order to prove the potential gullibility of the average office worker.

Presentation is for the average small business, a postmodern buzzword. Most firms suddenly want good presentation. However, they misunderstood the word, and '... develop a yearning to dress up this mundane material in multi-column displays of dinky fonts and graphics'. (23), p.21. Indeed, such is the earnestness of first-time users of this equipment that the results look like 'an explosion in a type foundry' (23) p.22. Obsession with the superior appearance of some thing inevitably leads to lack of attention to the content of that such thing. Therefore, 'subordination of function to form' (23), p.22 is the typical mistake of the non-designer using a DTP system. The main reason for this is incapability to interpret the meaning of the document he is 'designing', typographically. He can't make the decision whether to play by the rules, or to break them for creative reasons, because he has no knowledge of the rules. Fig. 16 shows an example of this subordiation of function to form. The double-page spread from a publication designed completely on the Macintosh, shows the designer's lack of control over his tool. The headline makes extensive use of different typefaces, different weights of a typeface within one word, all apparently without reason and, due to the designer's lack of typographic knowledge, without aesthetic effect. The blank rectangles are used, supposedly as 'graphic devices', yet they are unnecessary and serve no function. Other design faults include the use of capitals in the subhead, reducing its readibility and the combination of large point size and tight line-spacing in the body copy.

The situation where a client who has traditionally gone to professional designers to find solutions to his design problems, acquires a DTP system, such as the Mac, and suddenly no longer hires professional designers, is

becoming more common. Because he is now finding design easy, he assumes he must be doing it well.

Inevitably, the use of a DTP system increases the user's knowledge of design terminology. Words like leading, justified, ascender, descender, counter, become second nature to him, and make him confident, despite the fact that he has no knowledge of the origin of these words (see fig. 6) . Such a person could become parrot-like, repeating the same phrases over and over, without knowing what he himself means.

Consider the client who has up to now sought the professional assistance of designer X. He buys a DTP system with the good intentions and eventually realises that all his design needs are not satisfied, buys a new Macintosh computer. So he still goes to designer X for some jobs, or parts of some jobs. Armed with his new terminology, he finds the design process is becoming de-mystified, and this can lead to a sudden diminishment in the respect the client has for the designer. If we take such a scenario to its extreme, designers may be forced to change their attitudes and roles. If they remain stubborn, the everyday commissioners of design may appear threatening and unappreciative of the designers' talents and responsibilities.

However, there is another side to this argument. Some designers see the DTP explosion not as detrimental to the designer, but as beneficial: 'Design tended to be something which was taken for granted, but if a client has a go himself, he then appreciates you more. People now know what typography means.' (23)

Open-mindedness could become the greatest asset in clients. The open-minded client could accept that he himself was not a designer, no matter how many gadgets he had, or better still, he might learn the distinc-

tion between learning how to use the design tool, and learning how to design. When the pupil tries and fails, he has better reason to go back to his teacher to be shown how to do it right. however, if a pupil tries but thinks he has succeeded, then he will not return to the teacher, but press on blindly instead. Unfortunately in design, the answer isn't at the back of the book. there is no-one 'correct' solution to any design problem.

Whether or not the client or DTP user realises his or her mistakes, it is up to the designer to make sure that the DTP phenomenon becomes beneficial to his profession. According to John Banks of Banks & Miles design, 'I think that designers owe it to themselves and their clients to get involved in it' (23),p.24. One form this involvement has taken so far is the production of design books for the average DTP user. These generally consist of rules which, if followed, will almost guarantee the production of acceptable, if not outstanding design. The emphasis appears to be on asking the DTP user not to expect too much. Often the almost unlimited possibilities of the Mac invite their automatic use in every piece of publishing, while restraint would be far more advisable. a good example of this type of book is Jan V. White's <u>Graphic DesignfortheElectronicAge</u>. It is good because it does not patronise the reader, a trap which this type of book can often fall into.

Involvement in this phenomenon can also take the form of 'corporate identity on disc'. This means that the designer would be asked to draw up a framework or a grid system into which all the company's documents would be 'designed', giving a corporate look unique to that company. Once the most difficult, though invisible 'real' part of the job is done, the client can simply apply the content of each document to this design framework without actually having to think through the nuts and bolts of its design. This would

undoubtedly increase the client's respect for the work of the designer, because he can get to grips with the actual design himself, manipulate it without actually destroying it, and slowly learn why and when it is actually necessary to hire professional design services.

DTP is a transitional phenomenon which will continue to have a profound effect on the world of design. There will be some clients who no longer seek the help of designers, and there will be some, who never sought their assistance until they bought a Macintosh, a scanner, and a printer, and slowly realised the need for design, and there will the client who, although he has a DTP, still hires designers. DTP is already heralding the beginning the de-mystification process of design and what a designer does. A general improvement in client - designer communication may take some time, but will eventually come about. Design will become less 'precious', more the property of the common man.

DTP is changing the designer's responsibilities and will eventually lead to an overall increase in the quality of design. There is no reason to suggest that DTP will ever disappear, but even if it did cease to exist, the lessons it would have taught us would still be relevant.

Chapter 6

Creativity

Originality is valued very highly in the field of design. Functionality, we are told, is the most important role of graphic design, but this seemingly mundane necessity is built around in different ways so that the designer can make the solution distinctive, or at least appear to be. Housewives, secretaries, businessmen and designers approach the Mac in a similar way at first. The seduction of the Mac didn't discriminate against those who ought to have known better, and experimentation became common (fig17(a) & (b), fig. 18 (a) & (b)).

The 'newness' of the Mac excites all designers. Increased competition, in all fields of industry had lead to the never ending search for something different, something new, and the Mac often seemed to provide the answer. The time saving aspect of the Macintosh is attractive but not as exciting as the unexplored potential of its creative possibilities.

The desire to be creative introduces another dimension to the Mac. The Macintosh's effect on creativity is two fold, and paradoxical. Firstly, it sets free the imagination of the designer because, through the combination of the inexperienced operator of the machine, mistakes inevitably happen. Of course, most mistakes are clearly an unwanted annoyance, but the perceptive can see that what may be a mistake in this application might be a solution for another, yet to materialise. 'Happy' accidents, then, are one of the features of the Mac which help the designer to be creative.

Secondly, the Mac places constraints on the creativity of the designer. Paradoxically, it does so because it offers so many new possibilities for chang-

ing the appearance of design. This two-fold effect of the Mac on creativity will be discussed later in this chapter, but first of all we must understand exactly what creativity is.

We often see something fresh and new in design and immediately conceive it to be creative. It is not merely the newness of that deserves this description. It is also the fact that it solves the problem and helps us understand the message the designer is conveying. Often we find it difficult to understand how the designer arrived at this new way of seeing. Douglas R. Hofstadter in his book, <u>MetamagicalThemas</u>, offers his definition of creativity. He defines it thus: "Making variations" on a theme is really the crux of creativity' (15)

By striving even to our utmost to be original or 'creative', we will never achieve our goal, according to Hofstadter. He discusses the act of being creative in terms of 'twiddling knobs'. Imagine that any existing concept or idea has a set of parameters which are controlled be a set of knobs. By twiddling these knobs or any combination of these to varying degrees, we will create something different. The act of twiddling the knobs is easy of course, for, as Hofstadter put it, 'The bottom line is that invention is much more like falling off a log than sawing one in two'(15)

So now, can we say that being creative is that easy? For the person capable of creative thought, it is. Creativity is not something which can be learnt. It's not really a question of just twiddling knobs, otherwise anyone capable of opening a door would be creative. The crux of the matter is seeing the right knobs, and then deciding how much to twiddle them. The right knobs are the ones which point in the right direction (in the case of designers) towards solving the problem, and knowing how much to twiddle the knobs helps complete our journey.

More often than not, creative people are not able to explain how they are creative, they simply <u>are</u>. To the outsider, creative thought is a mystery: "Too often... we simply indulge in wishful thinking. When we consider that the genesis of a clever or beautiful idea was somehow due to unanalyzable, magical, transcendent, insight rather than any mechanisms- as if mechanisms by their very nature were necessary shallow and mundane'. (15) Arthur Koestler, in his book TheActofCreation, offers a view on creativity that concurs with, but also expands upon Hofstadter's theory. He says that something news can happen when two concepts 'collide' and fuse something not present in the concepts themselves. Therefore, the whole is somehow greater that the sum of the its parts. And in many ways, the two parts are often unrecognizable in the whole, such is the transformation that has taken place.

Hofstadter describes, how creativity comes about in terms of these three steps;

• fresh ideas get unconsciously framed in terms of familiar concepts.

those familiar concepts come equipped with standard knobs to twiddle
twiddling those knobs carries you into fresh new conceptual territory.
This is a closed loop and so can repeat itself 'ad infinitum' unless the process is stopped somewhere along the way.

Creativity has to do with ideas, and not machines or tools, and so the Mac might seem irrelevant when discussing design creativity. However, in a way the Mac is caught between two creative forces.

Both 1 the creativity of its inventors, including that of the manufacturers and designers of the software, and 2, the creative force of those who use it. the computer itself as Crans Baldwin (a designer) put it, '... cannot give us design creativity' (26),p.68 but it can help us find it in our own

Constraining Creativity

The giant leap forward currently being taken in the computer graphics industry are taking their own toll on design creativity in a way that could never have been forecast. The unassuming power of the Macintosh is somehow trapping the imagination of designers. As the famous designer Milton Glaser put it: '...they tend to dominate people's abilities and imaginations' (26), p.69

The logical step for designers to take is to think up their idea(s) and then consider which would be the best tool to execute that particular design, or that part of that design. Perhaps a combination of tools would be needed to solve the problem. However, with the presence of the Mac, that stage of decision making is often skipped because of the myriad of tools which the Mac provides.

The decision to use the Mac may not be a properly considered one, but instead, an automatic reaction. The next step is that the decision to use the Mac is made even before the ideas are thought out. Such a situation can lead to the medium taking precedence over the message.

Before long, the designer may sidestep the essential process of thinking out ideas with a piece of paper and a pencil, and opt for the softer option, the Macintosh. Because there is so much that can be done with the Mac, the assumption is often made that it can therefore 'do more'. Unfortunately, the Mac possesses all the characteristics that make machines machines. And so, it is common to find designers sitting in front of the Mac, trying every facility and wondering why they haven't yet been able to produce a piece of design.

This is not necessarily the only scenario and, if the designer is intelligent enough, this will only be a temporary situation. The embryonic stage of the Mac's development and the present relative lack of Mac-experienced designers would suggest that this is so. However, the judging by how strongly designers are influenced by each others work, and seduced by slick, attractive results, the effect of this phenomenon of the design industry may be relatively long-lasting.

I mentioned before the seductive power of the Mac. I believe that the essence of this power lies in the aimless self-perpetuating tinkering with the different tools of the machine. Again as Milton Glaser put it : '...in response to that particular tool, they do things that they would not do normally for any other reason' (26),p.68 Our natural curiosity gets the better of us and 'there is a tremendous temptation... to curve, slant, and drag every line of type you set.' (37),p.39. (fig.19).

Of course, this is the type of trap that we would like to think of the first time DTP user falling into, and not the experienced professional graphic designer. However, their insatiable curiosity for novelty in appearance often counteracts that professional experience.

Not only does the Mac alter the way in which we carry out our various design processes, but it alters our thinking process. Even the essence of good graphic design, (a few good ideas), cannot escape the influence of the Mac. Before the advent of the Mac, the range of special effects available were relatively few, and considerably more expensive than the normal piece of typesetting.(fig. 20) Designers were conscious of designing with these

restrictions in mind, and so they did not influence their creative thinking in any adverse way. Because the Mac is so new, so recent, many designers are painfully aware of a sudden change in possibilities for 'special effects'. This knowledge, coupled with the very low cost of obtaining such 'effects,' has an unfortunate way of altering the design from the word go. Of course, this does not happen universally, but where it does occur, it is easy to spot, mainly because of the inherent 'personality' of the Mac (which I will discuss in Chapter 7), and simply because the Mac is new, different in so many ways to what has gone before.

The main advantages to any medium can be seen in what it does best. The more sophisticated the design tool, the more inflexible it becomes. Despite the Mac's many facilities, it remains rigid and machine like. Each individual capability is useful, as it stands but cannot be dealt with in the same creative manner as say, a paintbrush, or a chalk pastel, or a pencil. It is difficult to combine all the Mac facilities in one single act compared to the ease with which this can be done with the paintbrush. In fact, in many ways, these two tools are opposites of each other. The brush is apparently limiting, but rewards experimentation easily, reveating more and more hidden possibilities as the user becomes more experienced. The Mac on the other hand, appears limitless in its possibilities, but once you delve into its different operations, it becomes more and more stubborn. You feel as if you are required not to use it for any other purpose than the exact one it is designed for. The Mac is the same tool to each designer, yet the paintbrush can be a different tool, depending on the hand that holds it.

Having said this, the Mac is not totally devoid of creative possibility. For the inexperienced user, the initial enthusiasm may lead him to make mistakes or to accidentally neglect to instruct the Mac how to do a particular

job. When one omits an instruction to some specific element, the computer's default system comes into operation, applying a preprogrammed instruction to that element.

'You see things; and you say 'Why?', But I dream things that never were, and say 'Why not?' George Bernard Shaw, in Back to Methuselah. (33)

'Seeing things that never were' is another way of defining creativity. Seeing the possibility that something might exist that never existed before if the right 'moves' are made. Even the designers of the Mac could not have foreseen all the possibilities of the machine, all that could be produced using it, simply because all they have done is provide us with a set of 'knobs' which it is up to us to 'twiddle'. In this way, using the Mac is a good analogy for the process of creative thinking, but the act of operating the Mac should not be confused with the process of creative thinking. What is important, however, is that the freshness and newness of the Macintosh gives it new possibilities for helping creativity. We can focus on two ways in which this can happen. The first is the default system, and the second is making mistakes due to lack of practical experience with the computer.

The in built 'default' system is an 'automatic' mode which the computer slips into when it is not instructed to perform a specific operation. For instance, if you type in some copy and neglect to instruct typeface and point size, the Mac will automatically set it in 12 point Geneva solid (fig.21).

Geneva is a typeface unique to the Mac, and is similar to Helvetica. It is visually considered to have little aesthetic or design value, and in most contexts, this is true.

Fig. 22 shows a situation where this aspect of the default system could be useful. four or five words have been set in Garamond Bold Italic. Since they are all in separate text boxes, they have to be specified separately. The operator has neglected to specify the desired typeface for one of the words; and so, this is output in 12 point Geneva. The unexpectedness of this result could trigger off a new line of thinking, which in turn can lead to a new, possibly better idea. The actual printout may show the designer a new combination of typefaces and sizes which he or she may not have previously considered (for any design job), and could be momentarily 'filed away' until a use could later be found for it.

The default system has a further significance. In solving typographical aspects of design, it is normally the aim of the designer to 'get it right'. Not everyone, however, would agree. Tibor Kalman, for example, of M&Co., a New York design firm, says: 'When we do pick a typeface, we try to pick the wrong typeface. The easiest thing to do is pick the right typeface, but it is the wrong typeface that will expand the idea' (2), p.7.

In this way, forgetting to specify one element or piece of type could lead to a more exciting design.

Another example of the default system can be discovered through coincidental (or otherwise) use of different Macintoshes during the course of the one design job. Apart from the relatively small number of typefaces preprogrammed into the hardware, all the Mac's typefaces must be obtained separately on disk, and loaded onto the hard disk, allowing each designer to choose his or her favorite or most commonly used typefaces. If for, example,

Helvetica Condensed is used on one terminal, and the user's disk is transferred to another Mac to complete the design, if the second machine does not contain HelveticaCondensed, all the type set in Helvetica Condensed will be changed to Times Roman. the result, the majority of time, will not help the designer, but occasionally it may open the designer's mind to new, previously unconsidered possibilities. Perhaps one of the most commonly encountered default systems of the Macintosh is the automatic 'reversal' of the colour of type when it is scrolled or selected (fig. 23) The unusual shapes in this example can add to the typographic vocabulary of the Macintosh user. Exploitation of these and other aspects of the default system provides the designer with an opportunity for a new, more creative approach to the Macintosh. Despite its sometimes overwhelming rigidity, there are ways in which it can help the creative thinking processes.

Inexperience leads to mistakes, and in turn, leaning from these mistakes can increase our knowledge, and in turn, our experience. Working with the Mac is not different. While it is easy to lean the basics of its workings, advancement may be slow, because the more sophisticated and unusual facilities of the Mac are used less often. So for this reason, there is a certain amount of trial and error involved in working with the Mac. Of course, there are manuals supplied with all the software, but designers usually prefer to find out these things on their own, without outside help. Mistakes are often annoying, but if an open mind is kept, they can have some use. And the mistakes produced by designers on the Macintosh are among the most unusual and unexpected. Figure 24 shows a logotype ('Adobex') which I was in the process of designing on the Macintosh. On the left is the desired result (a black and white version of a purple and yellow logo which I had on

screen). On the right is the actual logo which printed out. Part of the excitement of this mistake is the fact that I can offer no explanation for how I produced it, (for I was executing a relatively simple operation). To execute this purposefully would be a relatively difficult operation, and of you were not aware how to go about it, you might be more inclined to reject the idea. Though not of any use to the project I had in hand at the the time, this may yet prove to be a valuable mistake.

How the Mac affects the creative thinking of the designer is up to the individual. For though powerful in the effect it has on people, the Mac itself is, of course, totally impartial. Unfortunately, to begin with at least, its negative effect is felt more often than it's positive effect, and as the designer becomes more experienced on the Macintosh he or she will of course make fewer errors, and while this is desirable for the majority of the time, it also leads to the virtual elimination of the creative thinking which can stem from these mistakes.

Chapter 7

New Language / New Aesthetic

Changes brought about in the creative process by an external force, automatically change the look, feel, and sometimes quality of the design, given that the creative input is probably the most significant. The vast majority of designers who have voiced their opinions agree that the Mac is beginning to be instrumental in the creation of a new aesthetic. A new aesthetic (if we take this to mean changes in the overall appearance of design) in its current form is very risible and very strong. The new language, on the other hand, which is a more subtle, deep rooted phenomenon, is inherent in the Mac, but because of different designers' attitudes to it and how they chose to exploit it.

The main physical attributes of the new aesthetic (of which most visually aware people are aware of, if only subconsciously) is the coarse bitmaps, or the appearance of pixels, sometimes known as 'low-resolution'. Their novelty and unfamiliarity are the reasons they are noticed, but this is only a transitional quality:

'Low resolution is the most obvious sign of the Macintosh's personality and as an acsthetic, it will slowly disappear as software becomes more and more sophisticated.' (10), p. 11. The unfamiliarity of low resolution is currently being exploited by designers. It is a powerful visual force, and it speaks of sophistication. By using it, the designer is telling his audience 'I'm abreast of the most recent technological developments', a sort of subconscious message from the designer's ego. In this, and in other ways, the low resolution personality of the Mac can have a negative effect on the design: 'coarse bitmaps are no more visibly obtrusive than the texture of oil

paint on canvas, but our unfamiliarity with bitmaps causes us to confuse the medium with the message '(10), p. 1.

Designers sometimes fail to see that using the characteristics of a particular technology in a forthright way can be detrimental to the communication of the message: 'If you airbrush on the Mac it's so rough that you always get these wonderful gestures out of things, because it's makings decisions and approximations at every corner'. (10),p.8.

They become blinded by their own enthusiasm for the medium, and need to be reminded of the need to understand their audience a little better: 'A lot of the work that was produced between 1984 and now on the Macintosh, such as April Greiman's, with the exaggerated jaggies etc., is a new visual language, but it is one of those things that people just don't feel comfortable with yet. (10), p.15

Despite the most convincing reasons given for the use of low resolution in a design, it is often the rigidity of convention which stops them from working. In architecture, the idea of showing the process of construction of the building in the building itself (fig. 25), has been successful.

It's equivalent in typography has been sought through the use of pixels, and low resolution typefaces (fig. 26), but, as Matthew Carters points out: '...showing the nuts and bolts in typography in the interest of truth to materials is less convincing perhaps because of the act of reading is constrained by much stricter conventions than the use of buildings' (10), p.22

Use of low resolution type should perhaps be used only when appropriate,

so that, instead of making a statement about the designer or the technique or the technology used to produce the design, it is making a statement about the product the design is promoting. The most obvious area is computer related areas of design. Packaging for computer software, logos for computer manufacturers, e.t.c. often call for this aesthetic. Its power however is in its novelty, and this will eventually wear off: '...the aesthetic of the Macintosh will become as vernacular as accepted as the typewriter has'. (10), p.6.

The increasing sophistication of machines such as the Mac and its offspring will bring about the demise of this aspect of the Mac aesthetic, Such are the advances being made in this area of computer graphics that it is difficult to judge exactly what value low resolution type will have in the future. Letterpress and the typewriter have, in their turn, created a homogeneous look to type, and computers will do the same. Low resolution is likely to assume the humble status of 'just another technique', to be used when the need arises, perhaps as a 'design device', or as Clement Mok sees it '...as an art form in the same context as I see other art forms that existed in a certain time period and which still exist and are still legitimate in the context in which they were created. (10), p.26

Using low resolution can increase our awareness of the need for good type design, and can help us see the familiar and commonplace in a new light. the type designs created in the 16th and 17th centuries such a Bembo and Garamond (fig. 27) have lasted much longer than the low resolution faces used today will last.

Despite what new technologies provide us with in the form of new aesthetic, 'we will always have an appreciation and a need for the letter forms that were rendered in the 16th century.' (10), p.6.

Appreciation of traditional images leads to the appreciation of traditional values. Any experienced designer working on the Mac will quickly realise the need for good design. No machine, no matter how sophisticated can provide that. The basic design principles, (no matter how far removed from them we may feel as we confidently move images and type about using a 'mouse'), underly everything that designers do, and use of the Mac can lead to . a greater understanding of these principles. Some of the frustration directed towards the Macintosh comes from surprise that low quality design is being output form such a sophisticated, and expensive tool. The eventual realisation that the ideas are what the designer must provide, brings with it a fresh understanding of what design is all about.

As our environment changes we automatically look to our knowledge to help us cope. In design it is no different. The environment of the designer is rapidly changing and suddenly everything about design seems to have been recreated or reinvented. The real importance of the principles of design quickly become apparent in such apparently strange environment.

Although many designers may realise the importance for traditional letter forms, the possibility of producing new ones with today's technology is quickly becoming more and more realistic. The basic principle involved in using the Macintosh also applies of course, to creating fonts on it. Thus, every detail of the design process, down to the structure of each letter can be controlled by the Mac. The average curious DTP user can, for, create his or her own fonts as he or she feels they are needed. However, in practice, few non-designers undertake the considerable task of designing a new typeface. The editing or altering of existing faces is, however, more common (fig.28) This has its disadvantages:

"The sense of what is sacred and what is profane about typography is under pressure, if nothing else' (10), p.22

The idea of breaking the rules without knowing what they are in the first place is at stake here, more profoundly than in any other aspect of design. However, realisation that typefaces produced by non-designers are inadequate will quickly dawn, for the difficulty in reading these inexpertly designed typefaces will literally make itself felt, then, perhaps, appreciation for the typefaces of the 16th and 17th centuries will grow, as is currently happening among those who ought to know, designers. Because of the digital type process used to create type on the Mac, 'A font made on the Mac by a graphic designer or a nonprofessional will wok just as well, in the technical sense, as a font manufactured professionally- and that is revolutionary, (10), P.22.

The various processes that take place in the field of traditional type design have been eradicated. Now there is no "barrier' of technical expertise between artist and manufacture. this is another reason for the poor quality of DTP. In the past, the printer had to undertake the technical aspects of non-professional design, including the typesetting, and so, production costs meant there was no room for extravagance or elaborate design.

The classical typefaces available on all digital typesetting systems today have been applied to several different technologies before the process of being digitized. For each technology, they were redrawn so that there is (to the trained eye at least) a noticeable difference between the original form and the most up to date digitized version.

A typeface like Bembo (fig.27) does not, however, reflect the nature of the

technology for which it was originally created. The process of letterpress did not dictate the way the typefaces looked. Their shapes were far more strongly influenced by the carving of letters into stone. (fig.29) The process of digitization has influenced the form that letters take to a much greater degree than any previous technology, and it is by this that we can measure the revolutionary nature of the Mac aesthetic.

Type design at the moment, is tied to the current technology. The primitive nature of this technology, implies that such a linking of type design and technology will be temporary, and so, as Matthew Carter argues: 'The life expectancy of a technology is now much shorter than that of a respectable type design, Why tie the two together?'(10),P.22. However, the new perspective on type design which this technology gives us, makes the exploitation of it in order to produce anew form of type design very worthwhile because its subsequent influence on type design win the future will be an important catalyst in moving design forward.

One designer who has been instrumental in this is Zuzana Licko of Emigré Magazine (fig.30) She has exploited the very nature, structure and appearance of pixels in order to create typefaces which are economical of computer memory abilities, of considerable aesthetic value and power, and though of low resolution, are sufficiently legible for use as headline typography. Low-resolution is of course a relative term, and what might be considered 'low-res' now will undoubtedly soon be obsolete, but there will still be cheap, low-resolution printing devices. As Licko says: 'Lower resolution devices will always be the most affordable, portable and efficient in performance. Thus the need for type and graphic standards that address the digital type generation process at coarse resolutions will remain in demand. (38), p.1. She has also designed another family of typefaces which exploit the

Postscript capabilities of the Mac. This process of delineating typefaces has an aesthetic which is less obvious than that of low resolution bit-maps. (fig.31) This shows' Matrix' which is produced using outlines. Simple curves and straight lines are used in the design of this typeface, facilitating ease of production, while retraining an elegance of form, and again, a very high level of readability for both headline typography and body copy. (fig.32), Initially, compared to her other typefaces, Emperor, Oblong, etc., shows little sign of having been produced by the Macintosh. This hints at the level of sophistication soon to be reached by the Macintosh. The language of the Mac is developing quickly. designers like Licko are exploring and controlling the directions it can take. The development of the language inherent in the actual mechanics of the Macintosh will be controlled by its designers, (both in hardware and software), but, as Matthew Carter has observed: "There are official languages, and there are dialects. Sometimes the less inhibited offshoots grow faster than the mother tongue and feed back to it more vigorous and colourful usages', (10) p.22.

Licko's typeface design could be regarded as one of these 'offshoots'. She is exploiting the nature of the technology in its existing form, thus aiding its further development. As the technology improves, the language of the Mac will develop, and in turn the implications for the designer will change, the creation of new programs for the Mac is a very substantial part of the development of this language, and one of most advanced programs created for the Macintosh, is Metafont, designed by Donald Knuth, and American scientist. The Mac is only as good as its software programs (like any computer). This program gives it (and the designer) powers which have the ability to truly revolutionise and drastically change our design language. It is a very good example of the creative exploitation of an already available

technology.

(fig.33), by Knuth himself, is an example of what can be produced using this program. By 'parametrizing'a particular typeface (Monotype modern Extended), i.e., defining its characteristics, in terms understandable by the Macintosh, Knuth then proceeded to gradually change the 'setting' of these parameters, until he arrived at the result in fig. 33. In his discussion of Knuth's Metafont in his book <u>MetamagicalThemas</u>, Douglas Hofstadter explains that the typefaces at the beginning and end of this passage were not already exiting typefaces:

The two ends of the spectrum were not pre-existing pre-specified targets; they just happened to emerge as the extreme products of a knobbed machine designed so that one more or less intermediate setting of its knobs would yield a particular target typeface. (15), p. 266

What he has so far achieved with this program then, is remarkable, but his vision of the future of digitized typography is inspiring. In 'Visible Language', he puts forward the idea of the 'unification of all typefaces' Hofstadter defines the two ideas underlying this philosophy: (1) 'That underneath all 'A''s there is just one grand, ultimate abstraction that can be captured in a finely parametrizable computation structure' (2) 'That every conceivable'A' is just a product of this machine with its knobs set at specific values.' (15), p.266.

It is difficult, even for the specialist, to believe that the parametrization of all 'A's in all typefaces could even be possible. fig.34. This illustration shows a sample of the range of typefaces currently available. It is immediately evident

that 'A' cannot be defined in merely geometric terms. Not every 'A' is closed at the top or open at the bottom. Some do not even have any feature to which the term' crossbar' could be applied. Such a parametrization would imply that all possible 'A's could thus be produced, and as Hofstadter points out, this would be an 'act of infinite creativity' (15), p. 261. The very act of trying to define what an 'A' is, brings us to a much deeper understanding of typefaces and type design. The application of existing type designs to new technology forces us to reevaluate what is the essence of good type design, and also, to 'chase after...' what Knuth has rightly termed the'intelligence' of a letter, making use of the explicit medium of the computer to yield new insights into the elusive spirits that flit about so tantalizingly, hidden just behind those lovely shapes we call letters.' (15), p. 287

Analysis of letterforms will inevitably lead to realisation that to attempt to define them geometrically is futile, and that to approach them as being composed of 'concepts' will teach us far more and lead to a new language that, apart from being a new form through which to communicate the same messages, it will be genuinely useful, and will lead to the more efficient and more powerful communication of new ideas which have never before been expressed typographically.

Knuth and Licko are two of the small number of creative people with the energy and vision to bring nearer the era of this new language. fig.35 shows the generation of Helvetica lower case' a' digitally, they range from the primitive to the sophisticated, and while all are recognizable as a lowercase 'a' the 'a's in the column of the left were produced by a program which simply 'turned on' all the pixels that fell inside the outline of the letter, while those in the second and third columns, were produced by programs with information about certain areas of the outline of the letter, and which were judged to have more information inherent in their shapes which were crucial to an accurate description of the essence of the letter. In other words; 'The idea is to pack as much of the spirit of a typeface... into the smallest number of pixels.' (15), p. 596.

Thus the computer was able to make a decision whether or not to 'turn on' a pixel which fell inside the outline of the figure, depending on the sensitivity or cruciality of that particular part of the outline. The top line in this illustration appears to be successful in defining the essence of the particular typeface. They appear to possess a considerable amount of 'Helveticality'. But look at fig.36. This shows 'a's from typefaces similar to Helvetica. For example, Univers is the closest (in appearance) to Helvetica. Is the best defined'a' in fig35 closer to Helvetica of Univers? Questions such as these make us confront the idea of the essence of letterforms more deeply than ever. It is the technology of the Macintosh and computer graphics in general and the language developing because of it which is making us look so closely at the building blocks of typographic design. And reassessment, reevaluation and a new understanding of these building blocks can only improve, in the long run, the quality of design.

the future

Instead of choosing to wait for this technology to improve we should exploit it while it is still young, because doing so will determine the direction the technology will take and the change in our attitudes towards it as it does develop.

So far computers have invaded our professional lives. The next decade will bring a dramatic change to our personal lives. More and more of our everyday lives will be replaced by a computerized equivalent:

The computer of the future will contain the 21st century equivalent of maids, secretaries, butlers, gardeners, and drivers. You will have these little characters hanging around just waiting to perform specialised tasks for you. (26), p.25.

However, the prevailing science-fiction influenced preconception of a 'computer dominated environment' is a fallacy; as David Tebbut says in 'The Mac at Large'; 'Computers won't just be easier to use, most of the time we won't even be aware we're using them' (26),p.25.

Some forms of communication are more technologically advanced than others, and by examining these areas, we can see that technological advancement doesn't necessarily mean better communication. Music, for example, continues to be more and more electronic based. Acoustic instruments are used mainly for their nostalgic value, a mock tribute to tradition. According to Malcolm Garrett (a designer involved in the entertainment industry), the printed book will soon be subject to similar advancement: 'The only reason for retaining books will be for pleasure reasons. Just as the camera replaced the role of the painter, what I call the 'world information library' will replace the book.' (10), p. 24.

Such a change has huge implications for designers. In the media lab in the M.I.T., work is being done on the realisation of such a 'world information library'. a personalised, on-screen newspaper is being developed, with sample headlines such as 'Meeting at 3 o'clock Cancelled'. The hierarchy of the importance of news changes for the individual, so that no two newspapers are the same. The idea of a potentially different layout and design for every individual will significantly change the role of the designer. Just as those who normally listen to electronically produced music 'will also enjoy a little classical acoustic guitar while on vacation in Mexico,' (10), p. 32, books will still exist, but their role will change from having a functional role towards a purely aesthetic role, and so, while books, brochures etc., will still have to be designed, their function will be different. The Macintosh will continue to become more and more sophisticated while designers adapt to it more readily. The next stage will be total reliance on this new vernacular, that is, until a new technology appears, and makes the Macintosh look distinctly old-fashioned.

Conclusion

In the relatively short space of time since its introduction, the effect of the Macon the world of graphic design has been profound. The obvious example of this is its time and cost saving facilities which are outwardly changing the printing, publishing, and design industries. Speed and control are the key factors in this external change. As the Macintosh becomes more sophisticated and more highly developed, it will continue to have great effect of the economic side of design and print.

Far more interesting, and unexpected is its significance in relation to how design is actually conceived. Realisation of the effect of the Mac on the process of designing is only now dawning. The sophistication of the Macintosh seduces, and invokes a powerful intellectual and emotional reaction. This is remarkable, considering it is only a tool, under our control. The Macintosh is often regarded as something far greater than it actually is. Its true significance lies in the exploitation of its potential; and this can only come about through change in the attitudes of its users. As with all machines, the Mac is useless unless it is being used. An understanding of the Macintosh (not just how to use it, but how to use it well), will help bring about a truly positive harnessing of the technology. The Macintosh was invented by and for humans, and so, it will take human thinking to bring about the full exploitation of this technology.

The role of type is changing with the advancement of digitization and

computer technology, Donald Knuth and other far-sighted individuals have begun to look at type in a new light. An increased understanding of type will stem from the increased control which the Mac gives us. Designers must take on the responsibility of educating its audience with this new power. More crucial than ever, is an understanding of type and the need to differentiate between good and bad design. As more and more untrained 'designers use the Macintosh, the definition of what is good design, will become blurred, and will eventually lead to a need for a fresh evaluation of the basic principles of design.

It is impossible to predict when interactive computers will become commonplace. The reading of text from a screen will require a certain amount of relearning of the basic principles of design and the gradual formation and development of a lot of new ones. With the Macintosh, we are being given the chance to make these changes a little easer to digest, when they do come.

As we wean ourselves from the drawing board to the screen, we can begin to reeducate ourselves, to learn how to adapt what we have learnt to this new application.

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