

JOHN LANSDOWN

Born again

It will not have escaped your keen eye that this issue of the Bulletin is the first in a new format. After ten years of the Second, we are now embarked on the Third Series of the Bulletin - which aims to be bigger, better and full of items that you will not find elsewhere.

In keeping with the new spirit, you would expect me to change the style, content and thrust of this column. But I haven't and shan't. Unless you have notions to the contrary, it will be the mixture somewhat as before but, perhaps, with the occasional opportunity for illustrations in colour. I would like, though, to say more about what those of you out there are doing. Please let me know what you're up to - however informally.

Regular readers know that I am interested in any ideas or applications that broaden the scope of computing - in the Humanities, Science, Business and what-have-you. My concern, I suppose, is with what Brian Reffin-Smith calls *Soft Computing*. He defines this as matters 'encompassing art, design, computing and (a slight cough here) general world-changing'.

Brian was, until recently, the College Tutor in Computing at the Royal College of Art and has just brought out a fascinating book on this subject. Called *Soft Computing: Art and Design*, and published by Addison-Wesley, the book takes an idiosyncratic but always thought-provoking look at computing and information technology from the point of view of one who, for some years, has used computers to enhance the creative powers both of himself and others.

An example of his current work is Figure 1. This is called 'Police attacking computer graphic representations of themselves'. It is based on a frame-grabbed image from a newspaper photograph which has been passed through a drawing algorithm working on Brian's RML 380Z computer. This converts the image into a set of short lines for drawing on a Calcomp 84 plotter. The right hand picture is produced from a lower resolution version of the left hand one.

To put over ideas in his book, Brian uses text, freehand sketches, pictures, programs and interviews. On every page there is something to enjoy or get angry about. Everyone who finds this column of interest (and especially those who don't) should get a copy of this stimulating book.

Painting

Our first illustration in full colour occupies the cover and is an example of computer graphics produced on a Paint System. There are two basic ways of making drawings by computer. One is to give the computer a mathematical model of the scene you wish to depict and then ask for views of it. The other is to sketch the picture yourself using a paint system. In the first case, you don't need to be able to draw but, in the second, the quality of the picture depends on your prowess as a painter

and draughtsman. Of course, the system gives you aids for drawing straight lines, circles, ellipses and so on as well as in filling-in areas but, with a paint system, you are more or less on your own. It's not surprising, therefore, that the best paint system graphics are being done by those with arts training.

Our cover is by John Ashworth and Wyn Davis and was produced last year when they were students on Gillian Crampton-Smith's Advanced Graphic Design and Computer Systems Course at St Martin's School of Art. It was created on a Pluto paint system.

There are more and more schools of art now making use of computer graphics and in the last few issues I've shown work done at Ravensbourne and the RCA. In the next issues I'll try and illustrate some of the efforts of other schools. It is encouraging to see these developments even though the equipment available to many is pretty limited. Fortunately, there are four different British paint systems which are now on the market covering the whole range of costs from low to high.

Jackson, by Brian Reffin Smith, is the cheapest of these and works on RML 380Z machines - it's the one we have at the RCA. The Pluto system by IO Research is very good value because of the resolution obtainable although, as yet, it doesn't have all the facilities that Jackson possesses. Logica's Flair system has excellent facilities and resolution - as you would expect from a system designed by the BBC for use on television titles and so on. The most expensive and most versatile of the systems is the Quantel Paint Box which, in its full version, costs over £100,000. The quality of images obtainable from Flair and Paint Box is remarkable and is really only limited by the artists' imagination. Next time we have space on the cover or other opportunity to show colour, I'll include some pictures done on these systems.

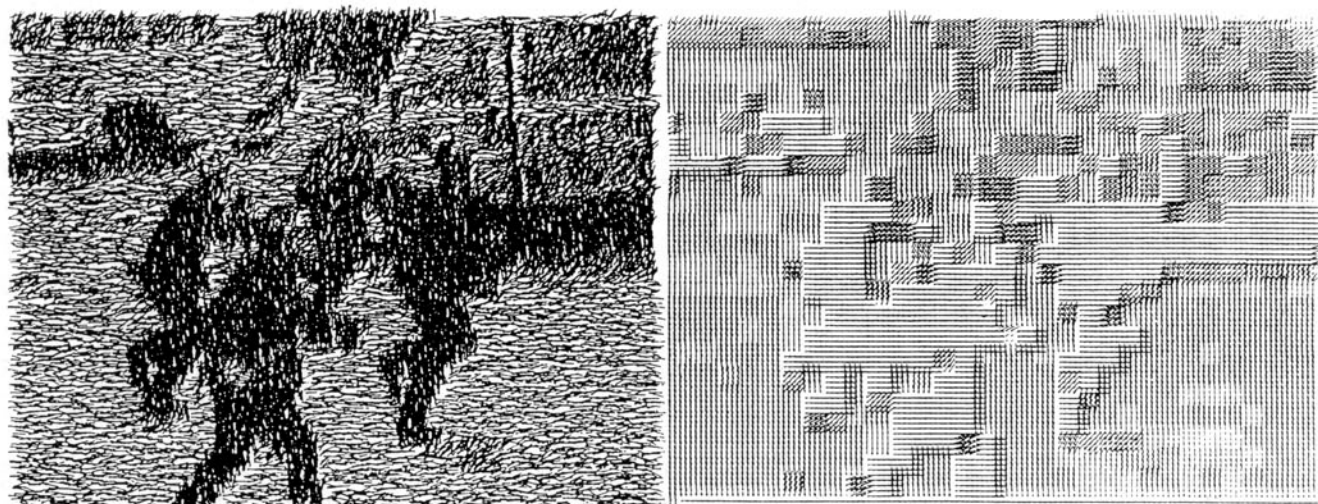


Figure 1

Escher, Escher, all fall down

No one who has examined the space-filling drawings of M. C. Escher can fail to be impressed by the ingenious way in which the figures interlock in seemingly endless variety. As can be seen from that magnificent book, *The Grammar of Ornament* by Owen Jones, abstract interlocking shapes had been used by artists for thousands of years but Escher seems to have been the first (and only major) artist to exploit them in a figurative way. I don't know the extent to which he used method rather than intuition to devise his drawings - certainly his understanding of pattern-making was profound, so he probably didn't need any algorithmic assistance to achieve his ends. We lesser mortals, on the other hand, are not so clever and have to resort to computers for aid in drawing interlocking shapes. That computers can help in this area is because only a limited number of different basic types of Escher-like interlocking shapes are possible. In fact, there are only nine major types giving 28 sub-types and all of these can be systematically generated by algorithm. Although the originally geometrical effort in devising the generating algorithms was done in 1932 by a German mathematician called Heesch, relevant computer techniques were worked out only as recently as 1978 by William W. Chow and his colleagues at the University of Illinois. The most accessible of Chow's papers is in the magazine, *Computer Aided Design* (July 1980 vol 12, No 1), and in this he explains the basic principles of the generating methods he uses to program the drawing of the 28 patterns. Using Chow's technique, I have written a program to allow the interactive creation of some of these. In order to achieve interlocking, the amount of freedom you have in determining the shape is limited. At best, only half the profile can be freely chosen but, for practical reasons, even this half has to be severely constrained. So, even with a

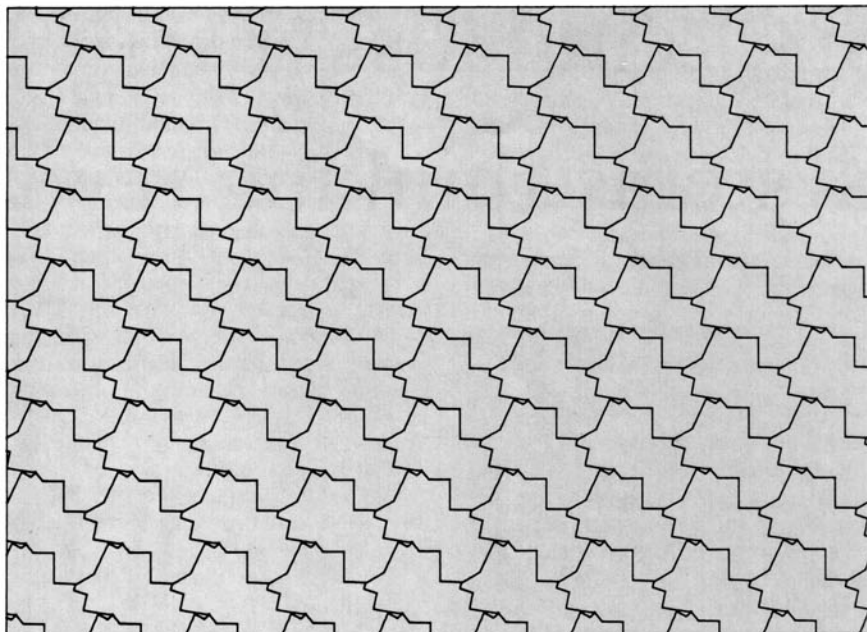


Figure 2

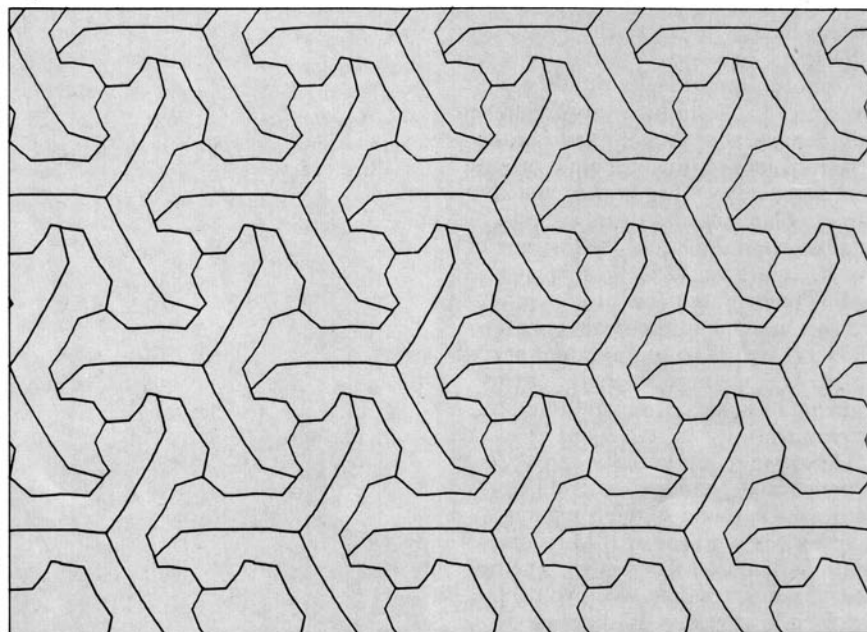


Figure 3

computer to help, you need to exercise considerable imagination and skill to make patterns remotely as good as Escher's. I've not yet managed anything

worthwhile but basic abstract interlocking shapes are quite easy. Two preliminary efforts are shown in Figures 2 and 3.

Correspondence

As a founder member of the BCS and first joint editor with the late Eric Mutch of *The Computer Journal*, I have tended until today to ignore much of what is written in the daily newspapers about computers. I am writing to you now, as I feel that the computer science profession is making a big fool of itself and of users at large. In today's *Daily Telegraph*, it is estimated that there are now over 600 different types of micro-computer available and that some of the makers will become bankrupt. It is also reported that a teenage student using a Sinclair Spectrum costing £125 in his bedroom with own telephone line and other terminal equipment has been

able to break into confidential data files, containing medical and other records.

This is quite ludicrous, and the designers and engineers of the systems broken into have been guilty of gross negligence in allowing the service codes and access circuits to remain in a form which permits this to happen.

All such data files should be protected as soon as possible by being made available only to pre-determined lines, dedicated to necessary working on such files. Access should depend not only on passwords, but on mechanical verification of a physically recorded code, mechanically stored in the terminals permitted such access.

The idea that any businessman, or

student hacker, with a £125 computer and modem, can break into the system from any telephone line is quite unnecessary. If someone needs information, when he is away from his normal office and terminal of access, surely he can telephone his office and get the information that way? It is quite unnecessary to insist that users of such data files should have access to them at all times from all places, if they take their terminals around in their car. Such wide usage should not be regarded as feasible, until the designers and engineers have made the systems secure from interference or exposure to unauthorised computer hackers and potential thieves.

HAROLD W. G. GEARING *Malvern*