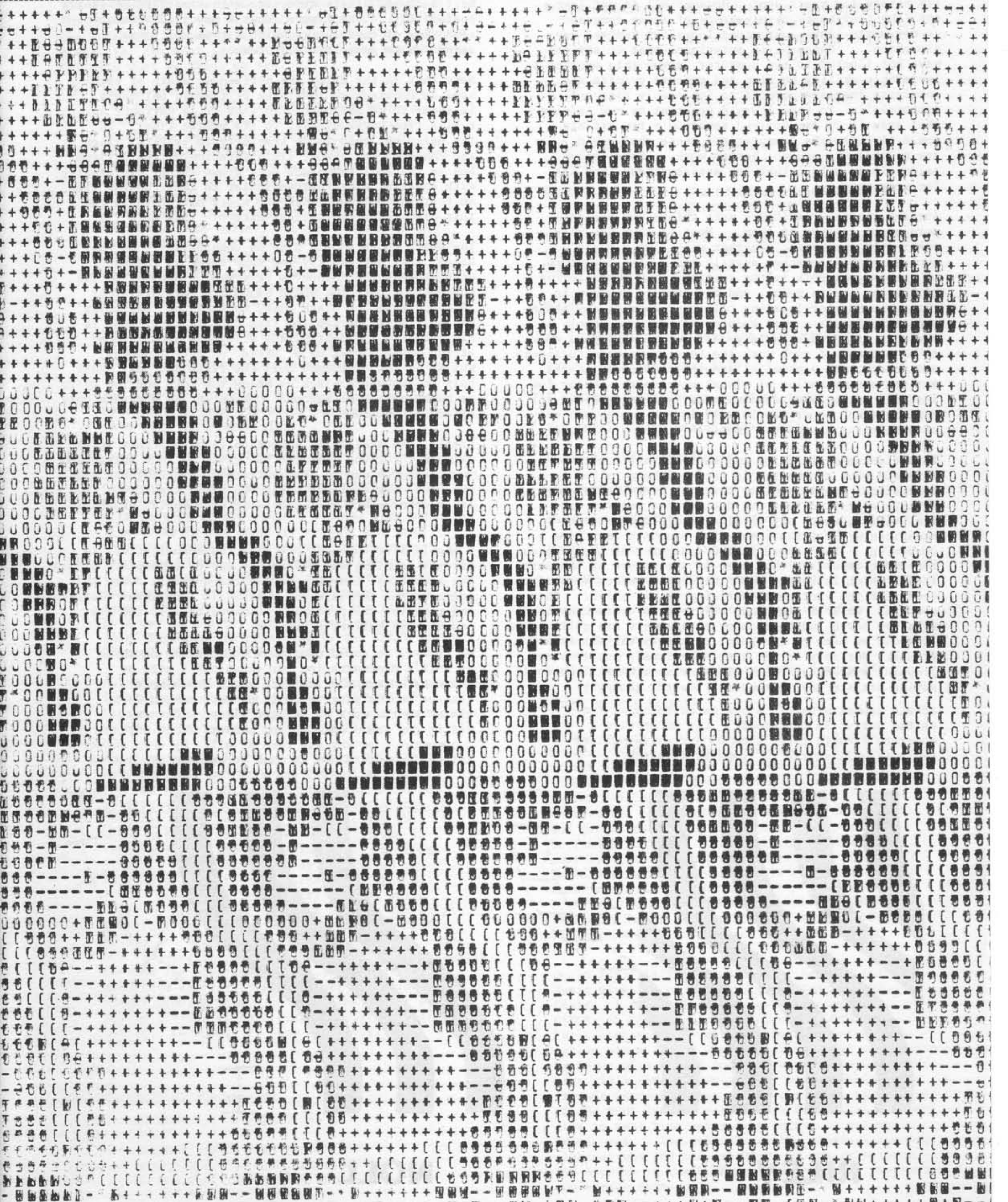
PAGE 36

July 1975

Bulletin of the Computer Arts Society



NOT FLOCKING TO THE COMPUTER?

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Mallary writing in Page 34 comments that 'computer graphics arrived too late to influence Op Art during its heyday ten years ago'. However all is not lost for 'the over-hasty obsolescence of these come-and-go movements leaves untouched lodes for renewed exploration'. Hence he is surprised 'that Op artists have not flocked to the computer, given this machine's incredible ability to plan and execute precise and intricate images according to implacably rigorous protocols'. To this I would contrast my own opinion that even if Op Art arrived tomorrow - few artists would flock to the computer and those that would are unlikely to produce better work. Speculation aside, it is a fact that few artists today find use for computers.

Artists characteristically make things for the sole purpose of looking at them. Most of them use only their eyes and hands, together with simple media such as pencil, guache, acrylic etc. The advantage of such manual work is the continual visual monitoring of how the job is going, and the immense freedom to change to more-or-less any colour or form at any stage. Even time is not a real constraint for in a couple of days one can produce a large and detailed graphic work. As an outcome of such work the hand grows more confident and steady, and a parallel growth takes place in the artists understanding of visual phenomena. Refer for instance to the many studies made by Bridget Riley (1) done on graph paper say 30 x 17 inches in the process of developing her visual ideas.

This closeness of artist and media is difficult to maintain when a computer is used (although a few exceptional people achieve this). Nevertheless most artists will find that the design of a program and its writing, which may involve considerable study of manufacturers' reference manuals, are both very time consuming. Then there is the debugging of the program. Even more important than time is the nature of the work itself which is remote from the visual medium an artist needs for the continual exerising of his skill. This computer work is sometimes referred to as 'dehumanised', a rather harsh judgment: many programmers are quite human. It would be more to the point to stress that it is non-visual. Not only is the work non-visual, but computer graphics systems and most of those specialists who could advise artists have a tendency towards geometry. I'm afraid geometry hardly explains anything as far as the artist is concerned. Let me provide a concrete example taken from Op Art which Mallary feels is well suited to computer graphics.

Bridget Riley has painted pictures consisting of serpentine bands in black and white, which when many of them (say 200) run in parallel across a picture give rise to a 'dazzle' effect on the eye by which the image is partly disintigrated. 'Current' in MOMA, New York, and 'Fall' in the Tate, London, are good examples (1). These may be compared to computer output produced by A Michael Noll such as 'Ninety sinusoids with linearly increasing period' (2). The figure shows a merely diagramatic rendering of these works which I hope will draw attention to geometric differences.

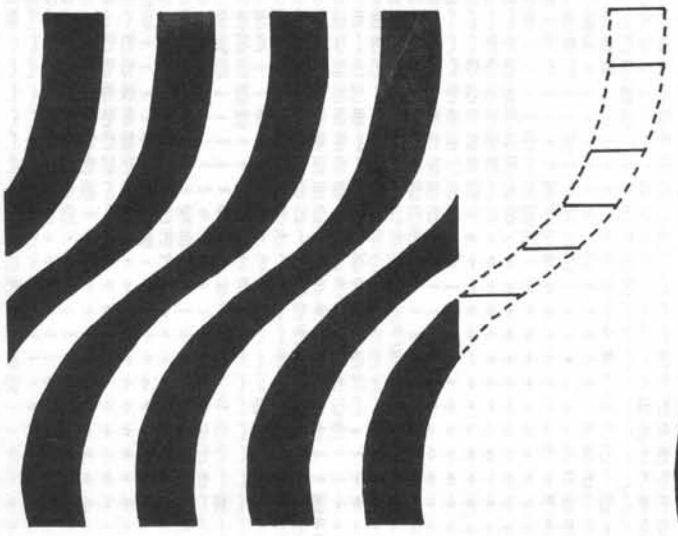
Note that in the Riley the horizontal width of each band is constant so that when it travels obliquely it seems to be narrower. In fact it is narrower in a direction perpendicular to its median line. In the paintings this lends stability to vertical lines and enhances the visual disintigration of the oblique. Now in the Noll the bands were drawn rather differently with constant width perpendicular to their median line, so that the oblique lines are wider horizontally and this diminishes the optical effect. See Note (3).

The white bands should also be considered. In the Riley, they are exactly the same shape as the black ones, merely the colour is reversed. However in the computer output, the white bands are very different in shape from the black ones, so that the 'switching' of the viewers perception from form to background is diminished. Incidently, the Riley has been trimmed at the edges giving us a 'field' of the phenomena, whilst in the untrimmed Noll the first and last bands help to emphasise black as being the form and the white as being merely background. Even in the diagrams this effect is apparent.

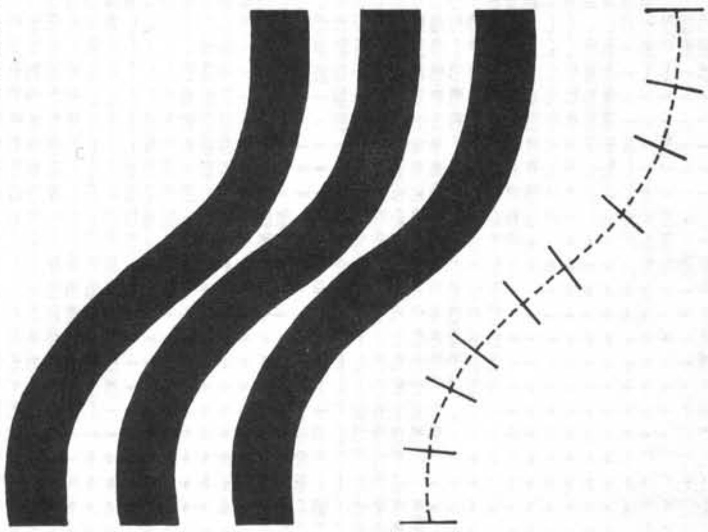
Lastly, the quality of execution is much higher in the painting, for the computer has given us some extraneous Moire textures due to its incremental plotting and also the 'mud' due to lines being too close together. Mud is an unfortunate characteristic of computer graphics (4).

I should like to point out that the manual effort in Riley's painting was reduced by use of a template giving the sinusoidal curves. Having run a pencil along the edges of the template she shifted it a constant distance and repeated the process. Compare this to the last sentence of Mallary's article.

Of course, we could program a computer to do this, as Noll's demonstration has shown and I hope my comments here would indicate how a few simple changes to the program would produce output much closer to the work of Bridget Riley. But she did it ten years ago, so why bother? And without a computer - so why use them at all? My only answer is: use computers not so much to produce art but to



RILEY



NOLL

test and develop ideas on visual topics. Since not all ideas can be applied, but only rather precisely formulated ones, and because it is rather difficult to describe artistic problems in this way, 'computer art' is likely to appeal mainly to people who happen to find computers fascinating, and to those who want to understand the visual in the same exactly defined way that computers operate. But to understand the visual we must leave geometry behind (5) for whilst most computer systems deal with geometrical problems. the artist is concerned with phenomenoligical problems - that is, not what is there (geometry and engineering) but with what we think we see.

(1) Maurice de Sausmarez 'Bridget Riley' (Studio Vista London 1970) containing many working drawings giving some idea of how her visual ideas were developed through graphic work done by hand. The book contains reproductions of 'Fall' 1963 (page 8) and 'Crest' 1964 (page 43). 'Fall' also can be seen in 'Constructivism' by George Ricky (Studio Vista London 1968) page 182, and the original is in the Tate Gallery London. Also for the same technique see 'Current' 1964 in the Museum of Modern Art, New York, the cover of Art International IX/1,1965, and the catalogue of the Responsive Eye Exhibition 1965 at the Museum of Modern Art, New York.

(2) Jasia Reichardt 'The Computer in Art' (Studio Vista, London 1971) page 26 for a reproduction of 'ninety computer-generated sinusoids with a linearly increasing period' by A Michael Noll. See also 'Cybernetics, Art and Ideas' ed Jasia Reichardt on page 159 where for some reason we have only sixty sinusoids.

(3) 'Vertical' and 'horizontal' refer here to my diagrams and to the painting 'Fall', but the painting 'Current' has the same features rotated through 90°. It is interesting to note that Riley did paint a picture with bands like those in the computer output, but used them in a rather different way, by spacing them more widely. The bands now become 'thin lines' (visually speaking) and serve to mark the edges of the broader white bands between them. In doing so she designed the picture in a way to exactly suit the technique employed. (See 'Exposure' in catalogue to the XXXIV Venice Biennale 1968, British Pavilion.)

(4) Colette S Bangert and Charles J Bangert 'Experiences in making drawings by computer and by hand' Leonardo Vol 7 No. 4 Autumn 1974 for a description of how to deal with 'mud' (page 292).

(5) For computer specialists to bridge the gap between their own work and that of artists is not easy, for their own research is graphics as diagrammatic or analogue representations of physical or mathematical entities, and this is often not interesting for the artist who is concerned with the visual impact of the image itself. Other examples may be studied on page 80 of the Studio International special issue 'Cybernetic Serendibity' (1968) where computer graphics of Donald K Robbins and Leigh Hendricks are printed alongside work by Jeffery Steele and Bridget Riley. The comparison shows the computer output to be very inferior, presumably because the programmers were satisfied with geometric similarity and did not enter into the visual problem domain in which the artist works. See my article 'Intelligent Computers and Visual Artists' Leonardo, 7, page 227 (1974).

COMPUTER GRAPHICS FOR ARTISTS

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MUSIC SYSTEM IN PISA

In the spring of 1974, following an agreement between CNUCE, Electronic Calculation Centre at CNR of Pisa and the Music Conservatory of Florence, a music theory and practical information course was held at the Conservatory. The theoretical part included elements of physics and acoustics, an introduction to programming including FORTRAN. This training consisted of exercises at the terminal connected to the Centre in Pisa permitting the students to participate in experiments with the interactive procedure and the DCMP program (Digital Computer Music Program) listening to the musical results of the requested elaborations in real time.

On 10 April 1975, Pietro Grossi, head of the Music Division of the Electronic Calculation Centre of the National Council of Research, CNUCE, of Pisa, held a conference at CEMAMu, Paris concerning research on Musical Information taking place at the Centre. During the conference, by means of a direct connection with the Centre of Pisa via a remote terminal, it was possible to arrange demonstrations of the operative properties of the DCMP Program realized at Pisa, with the work done in real time using interactive or automatic procedures. The musical results of the automatic elaborations and the execution of the selections in the Archive of the DCMP could be heard in the Paris conference room.

STANLEY GILL

We do not know who invented the wheel, but we do know who invented the subroutine: it was Stanley Gill during his early days at Cambridge.

Thanks to him also, there was a computer composed music contest at the 1968 IFIP Congress in Edinburgh. At an informal meeting to discuss the entries, methods and results, he suggested that some more lasting association could be formed of those interested in the creative uses of computers. That is how the Computer Arts Society was conceived.

It was a typically thoughtful act in a busy life, as President of the British Computer Society, Professor at Imperial College, London, in business and in research.

Stanley Gill died in April 1975 aged 49.

His epitaph might well be this definition he contributed to a dictionary of computers terms:

RECURSION - see Recursion.

Christopher Strachey

It is also sad to record the death in May 1975 of another computer pioneer, Christopher Strachey, lately Professor at Oxford. He was 58. He, too, had a varied career in industry and the University.

He conceived the notion of several people using a computer simultaneously, but he regretted the consequent rise of the time-sharing industry, and worked on the design of small systems for single users. He was always brilliant and charming, and always showed an interest in the activities of CAS.

EXPLOR-ATIONS

A second EXPLOR weekend course organised by CAS was held at Imperial College London in March.

The first day was spent introducing about 10 students (mostly with no previous computing experience) to the language. The second day to running programs on the CDC 6600 through the instant turnround service.

It is a tribute to EXPLOR that everyone achieved some interesting results in this very short period of time. The system/language is a set of FORTRAN subroutines which operate on an array of cells. Each cell has a value and there are processes to set and inspect values, to change values according to rules and procedures, and to output values as numbers, symbols or grey levels on a line printer.

I digitised a newspaper photograph of John Stonehouse (runaway British MP) on his arrest in Australia, and used EXPLOR to repeat it, to rotate it, and to change (rotate) the grey levels. Alan Sutcliffe

COMPUTER ARTS SOCIETY ADDRESSES

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This edition of PAGE was edited by
Alan Sutcliffe and Jacqueline Shane

Two recently published books of interest to members are *Electronic Music Synthesis : Concepts, Facilities, Techniques* by Herbert S Howe Jr. (J M Dent and Sons Ltd £6.50) and *Computer Animation* Edited by John Halas (Focal Press £5.00)

Unfortunately both works suffer from a difficulty which inevitably arises when authors write books about such fast-developing subjects : they are essentially out-of-date before publication. Howe, who is associate professor of music at Queens College of the City University of New York, acknowledges that his book describes the state-of-the-art circa 1973 (I would have put an earlier date) although Halas, a noted conventional animated film-maker, seems unaware that his book deals with the situation as it existed in the late 60's.

Electronic Music Synthesis is essentially in two parts; the first, a fairly simple introduction to acoustics and psycho-acoustics together with a run-through on the equipment and methods of synthesis; the second, a description of the computer sound-generation program : Music 4BF, covering similar ground to Max Mathew's book, *The Technology of Computer Music*. Both parts give a very useful overview to anyone unfamiliar with the basic principles of synthesis although experienced workers are unlikely to find much to interest them other than the particularly clear exposition of John Chowning's frequency modulation research.

Computer Animation is a work of compilation from a number of authors many of whom pioneered work in computer animation and most of the familiar names are there although there are some notable absentees. It is a strangely patchy book marred by a number of spelling and editing errors and some poorly produced hand-drawn pictures many of which are not up to the usual Focal Press standard : one is led to assume that the editor wanted the quality of the computer-drawn pictures, some of which are very good, to appear to be better than those drawn by hand; this is certainly the effect that comes across.

Having made these criticisms however one can say that the book is a useful record of computer animation techniques as they existed some time ago : developments in this field are continuous and rapid so there is still scope for someone to write a more up-to-date and cohesive text than this one. Until that happens, this book is the next best thing.

John Lansdown

REPORTS

Barry Truax: Computer Composition Sound Synthesis Programs

"To create programs suitable for use by a composer who directs the flow of activity from the Teletype through the various stages of operation, the results of which may be heard within a very short period of time."

Sonological Report No 2 1973
Institute of Sonology Utrecht

Ruth + Jay Leavitt: The Plastic Deformation of Design: An application of the Computer in Art

"When a plastic deformation is applied to a static design, there is a record of the force (its amount and direction) reflected in the image. The energy necessary to produce the force is imparted to the design, making it kinetic."

Technical Report 75-4 February 1975
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