



BULLETIN OF THE COMPUTER ARTS SOCIETY JUNE 2007

CAS Collection at the Victoria and Albert Museum



Christos Logothetis and Tony Pritchett



Jasia Reichardt with
V&A staff from the left:
Paul Williamson
Director of Collections, and
from the Word & Image Dept:
Martin Flynn
Douglas Dodds
Senior Curator, Computer Art
Julius Bryant
Keeper



Viewing the Collection

Photographs by
Catherine Mason

CAS Archives Transferred to V&A

As most readers of PAGE will already know, the CAS archives contain a wealth of information about the history of computer art in the UK and abroad. Indeed, PAGE 62 contains a number of articles about the collection and Birkbeck's work to document it via the CACHe project. In addition to material relating to the activities of the Society itself, the CAS collection includes an impressive range of artworks by many major figures in the history of computer art, including Manuel Barbadillo, Charles Csuri, Herbert Franke, Edward Ihnatowicz, Ken Knowlton, Manfred Mohr, Georg Nees, Frieder Nake, Lillian Schwartz and CAS's very own Alan Sutcliffe. Most of the collection consists of works on paper, such as plotter drawings, lithographs, screen prints and photographic prints.

We're pleased to report that the Society's archives have now been transferred from their home in the offices of System Simulation Ltd, to the Victoria and Albert Museum. To mark the handover, the V&A was delighted to host a well-attended and enjoyable reception in the Museum's Prints and Drawings Study Room on 11 May. Selected material from the collection was on display, and there were also thought-provoking speeches from George Mallen (System Simulation) and Paul Brown (CAS), plus Julius Bryant (Keeper of the V&A's Word & Image Department) and myself. Images and captions for the artworks were provided by Nick Lambert of the CACHe project at Birkbeck.

So, what happens next? The Museum is currently pursuing various funding possibilities which, if successful, should enable us to make the best possible use of the collection and to present it in a broader context. We are particularly keen to include key objects in future exhibitions and displays, and also to incorporate them in a range of printed and electronic publications. In the short term, the artworks and papers are being stored at the V&A's Archive of Art and Design at Blythe House, Olympia. We hope to be able to undertake more research on the collection shortly, and should be in a position to make further announcements soon. Thankfully, the CAS material also comes with a great deal of contextual information created via the CACHe project, and we expect to include much of this in the V&A's catalogue records as work proceeds. In the meantime, staff will do their best to make individual objects available by appointment at Blythe House (Tel. 020 7603 1514; email archive@vam.ac.uk).

The CAS material neatly complements the V&A's Patric Prince Collection, which has also been acquired by the Museum in stages in recent years. Together, these two major acquisitions form the basis for an emerging national collection of computer art. For example, the CAS collection includes Charles Csuri's *Random War*, whilst the Patric Prince Collection includes *Flies*, another of his pieces from the same period. Works on both these themes appeared in the ground-breaking *Cybernetic Serendipity* exhibition held at the Institute of Contemporary Arts in 1968.

The Museum and Birkbeck have also recently submitted a bid to the Arts and Humanities Research Council, seeking funding for a project to interpret the Patric Prince collection and display selected works from it alongside related material from CAS and elsewhere. These are exciting times, and it seems that the history of computer art is about to get the national and international attention that it richly deserves.

With thanks again to everyone at CAS and CACHe for making this happen.

Douglas Dodds

Senior Curator, Computer Art
Word & Image Department
Victoria and Albert Museum
London SW7 2RL

d.dodds@vam.ac.uk

PAGE: Forthcoming Issues

PAGE 64 will be a special issue edited by Paul Brown for the Darwin Symposium in July 2007. For details of the symposium see the poster on the back page of this issue and www.darwinshrewsbury.org

PAGE 65 and PAGE 66 are due to appear later in 2007. One of these will be a Japanese edition, edited by Yoshi Abe in Japan, assisted by Akemi Ishijima in London. The other will feature the latest drawing machines from Jack Tait, with some of their drawings.

Two further editions of Page should appear in the first half of 2008. Proposals and contributions for these issues will be welcome.

A gleaning from MA News, newsletter of the Mathematical Association

Philosophy is a game with objectives but no rules
Mathematics is a game with rules but no objectives
I would add
Art is a game without rules or objectives

The CAS Collection at the Victoria & Albert Museum: A Brief Overview

The collection of art works amassed by the Computer Arts Society span a period from 1960 to the late 1970s and amount to 210 pieces in total. There is a strongly international representation, including North American artists such as Charles Csuri, a large contingent of Germans such as Herbert Franke, Manfred Mohr, Frieder Nake and Georg Nees, and significant numbers of Dutch artists such as Peter Struycken.

Seen from an art historical perspective, many of these works share a similar aesthetic and approach to computer-based visual art. This might partly be an outcome of the image-generation techniques used for computers at the time, which were not real-time devices but needed to be programmed to create visual output. Mainly though, it was a shared aesthetic approach that can be found in the early issues of PAGE, one that was especially concerned with the mathematical basis for visual images and the computer's ability to produce a series of different images from the same program with differing parameters.

Although all the CAS artworks were processed by computers, they survive mainly because they were output to a very durable medium: paper. There are some surviving punch cards and spools of magnetic tape that hold the programs that generated the images, but in the absence of any way of reading these files, the printed images are their main outcome. By its very nature, computer-based art is a dynamic form that "exists" as much in the program and the data as in its printed result, so in a way these printed images do not represent the entirety of the art work. Fortunately some of the programs that generated them were also printed out and can be emulated on newer computers and the art itself re-created. But the historical value of these printed works in themselves should not be underestimated.

These pieces are a record of the formative years of computer-based art and indeed the whole field of computer graphics. Much of this work did not take place in traditional art spaces and was often exhibited in a range of new venues. The artists tended to be associated with the nascent computer industry (at firms like ICL), or with small groups such as the Slade School's Department of Experimental and Electronic Art. Others moved forward on their own; in the face of much official indifference, these artists tried to develop a computer-specific aesthetic.

The CAS, especially as represented by PAGE, provided an essential point of contact for artists around the globe who were making the first steps in exploring the digital medium. Taken as a whole, the CAS Collection is an important addition to the V&A's Word and Image Department as it represents one of the earliest concerted efforts to collect contemporary computer-based art works made by a dedicated organisation.

Forty years later, with digital imagery dominating a large part of the creative industries, it is good to see the official recognition of the origins of this art form. I hope the V&A goes on to acquire other collections that show the evolution of computer art.

Nick Lambert

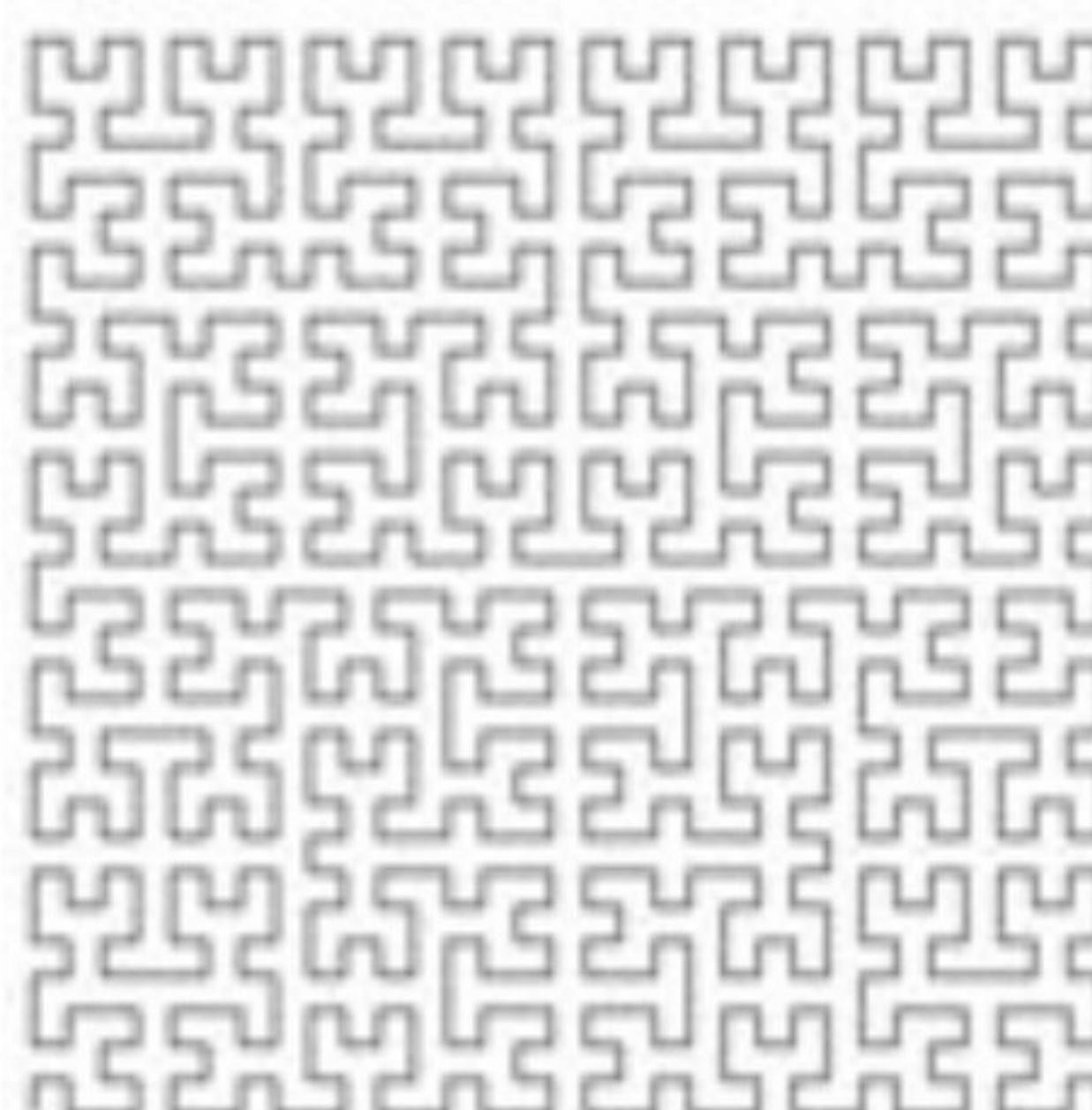
Art historian
Westminster University and Birkbeck

The CAS and the BCS An Apology to Readers

Almost since its inception the CAS has been generously supported by the British Computer Society (BCS) through its status as a Specialist Group of the BCS.

Each year the CAS submits a budget request to the BCS for the financial year beginning on the first of May. In 2006 the BCS had some reasonable questions about the application for 2006/07 but the CAS committee was very slow to respond to these. As a consequence some budget items were not approved: this included what is usually the largest item, the budget for PAGE. This has meant no issue of PAGE has appeared for over a year. For this, your committee apologise.

The CAS budget for 2007/08 has been approved and, as you see, publication of PAGE has resumed.



A space-filling curve attributed to David Hilbert
mathematician 1862 - 1943

Gustav Gustav Geschichte Geschichte Metzger Metzger History History

THE EXHIBITION

A major retrospective exhibition of the work of Gustav Metzger under this bilingual title was held in the spacious and sombre gallery of the Generali Foundation in Vienna from May to August 2005.

As the private art association of an insurance company, the Generali Foundation has set the goal of taking on tasks that are increasingly neglected due to growing economic pressure on art institutions to conform to market demands.

<http://foundation.generali.at>

No one is better suited than Metzger to fulfil this aim. Works and documents from the past half century showed a good part of his achievements, from the purely political as a member of the Committee of One Hundred to the mostly aesthetic liquid crystal displays, with many weavings of his social and artistic concerns between.

Historic Photographs: To Crawl into – Anschluss, Vienna, March 1938, had an appropriate central position on the floor of the main gallery space. A large photo of the entry of the German Army into Vienna is covered with a sheet of rough cloth. You can leave the image covered, as many do, or crawl under it to be up against this picture of the popular welcome for this parade of power. It was good to see posters for the exhibition around the city.

One small cabinet had early copies of PAGE edited by Metzger, while another had computer graphics and the metal model of his *Five Screens with Computer*.

THE BOOK

Edited by Sabine Breitwieser for the Generali Foundation, Vienna. German language edition 310 pages; English edition 280 pages.

Softcover: Generali Foundation, German or English, € 34

Hardcover: Hatje Cantz Verlag, German or English, € 44

The German edition was available for the opening of the exhibition in May 2005. The English edition appeared two months later and contains photographs of the exhibition.

This is much more than an exhibition catalogue. It is in three main parts: essays on Metzger's works, a detailed, illustrated chronology, and a collection of 26 of his writings. For reasons unknown to me the two articles on *Automata in History* in *Studio International*, March and October 1969, are not reprinted in the book. I would have preferred to see the main sections in reverse order, starting with the writings, which are an integral part of his work and almost always precise and direct, whether practical or visionary. There is also a bibliography and a checklist of items in the exhibition.

Sabine Breitwieser, editor and exhibition organiser at the Generali Foundation, begins her charming and beautifully written introduction by quoting a paragraph from Metzger that begins:

The main thing I am interested in is Complexity.

To start with this quotation from all his writings is brilliant. She gives a sympathetic pen portrait of Metzger, with only proportionate reference to his interest in destruction.

The well-informed and illustrated essays are largely free of art babble.

Justin Hoffmann: *The Invention of Auto-Destructive Art*

Christine Stiles: *The Story of the Destruction in Art Symposium and the “DIAS effect”*

Andrew Wilson: *Each Visible Fact Absolutely Expresses Its reality*

The last title is the first paragraph of Metzger's third manifesto, 1961. I still do not know what it means, unless it is only that things are as they are.

The only lapse in English I noticed is from the American writer, mentioning British colonisation but meaning colonialism. The tripartite form of the book has led to related illustrations appearing in different places, such as the three copies of PAGE that are shown. An index for the volume would have helped. But these are minor matters and this book is wonderful and I cannot now imagine not having a copy.

COMPUTERS

Gustav Metzger was one of the first to become active in the Computer Arts Society in the months before its public launch at EVENT ONE in March 1969. He was editor of PAGE from the first issue the following month, to which he also contributed a revue of the event, until 1973.

For the CAS post-mortem discussion on EVENT ONE he wrote *Notes on the Crisis in Technological Art*, arguing that "it would be

tragic if the Society [CAS] did not make some statement about the dangers of computers in war and the control of individual freedom in its policy declarations". The CAS did not have policy statements, though most of those running the CAS were at least in sympathy with his views, and Metzger wrote about these issues in PAGE, for example *Social Responsibility and the Role of the Professional* in PAGE 11, October 1970. As chairman and CAS representative at BCS meetings (the CAS was a BCS Specialist Group) I prepared myself to deal with any objections there may be to the expression of these views, but no objections were ever made that I heard of.

He presented two important papers at Computer Graphics 70 in sessions on computer arts.

Five Screens with Computer. Computer Graphic Aspects of a Sculpture Project.

New Ideas in Plotter Design Construction and Output.

This work is based on the realisation that existing plotters are not sufficiently flexible for the demands of art

The first part describes his experience of using a fibre optic light guide to draw on photographic paper. The main part is a tour de force survey of ideas for developments in drawing devices. All good practical stuff explained in his usual clear and concise style. The ways that software can compensate for the deficiencies of hardware devices are not covered. What a pity that there was no opportunity for him to collaborate with others in this country on the development of these ideas: Bell Laboratories would have been a good placement, though he may not have wished to go there.

Under the heading Self-Organising Drawings we see Metzger's far-sightedness.

Several drawing implements operating on one drawing could interact and produce original results. One implement can influence the activity of the others; they can collaborate, fight, go separate ways.

Put *robot* for *implement* and this could be from a project proposal now. Then the statement that many will still find challenging.

We need machines to tell us things we do not know, and cannot understand. This must be one of the goals of computer art.

But this was not a sudden flowering of Metzger's interest in the uses of computers and certainly not just brought about by his association with the CAS: on the contrary he was a big contributor of practical ideas and inspiration. As can be seen in his writings this interest flows out of the mainstream of his

thinking and his actions, starting over a decade earlier with his interest in technology.

Auto-Destructive Art can be created with natural forces, traditional art techniques and technological techniques.

The artist may collaborate with scientists, engineers.

These are two of the seven short paragraphs in his first manifesto, *Auto-Destructive Art*, 1959. In the second slightly longer *Manifesto Auto-Destructive Art*, 1960, the link with technology is strengthened.

Auto-Destructive Art is the transformation of technology into public art.

In the third manifesto *Auto-Destructive Art, Machine Art, Auto-Creative Art*, 1961, is the first mention of computers, allied with the notion of auto-creative art

Auto-Creative Art is art of change, growth, movement.

Auto-Destructive Art and *Auto-Creative Art* aim at the integration of art with the advances of science and technology. The immediate objective is the creation, with the aid of computers, of works of art whose movements are programmed and include "self-regulation". The spectator, by means of electronic devices, can have a direct bearing on the action of these works.

Generative procedures, self-regulation and interaction became key concerns in the early years of the CAS and remain so today.

In the mid-1960s Metzger continued to talk about auto-creative art and in 1966 had a liquid crystal display in the window of Better Books in London, which responded to the movement of people passing by. But destructive art, often without the auto- qualifier, seemed to prevail in his own work and dominate in those he influenced, especially through DIAS, the Destruction in Art Symposium that he organised, also in 1966.

Why is this not covered in the increasing number of writings about Metzger's work, for example in the essays in the Generali book. When the 2004 DVD *Pioneers in Art and Science: Metzger* by Ken McMullen was launched at the Hayward Gallery in London all that was said was that Metzger got into computers for a while and then got out of computers. Sadly there is still little understanding in many parts of the arts community of the relevance of computers for the arts. It is an area that people shy away from, through ignorance or hostility to anything requiring rational thought. In this respect the CAS has failed. It is not just a matter of education, as many working in the



Gustav Metzger beside *To Walk Into* at the Generali Foundation, Vienna



The wall of newspapers in *Eichmann and the Angel* at the Cubitt Gallery, London

arts are temperamentally averse to anything outside an essentially romantic view.

EICHMANN ET AL

Eichmann and the Angel was a commission for the Cubitt Gallery near The Angel Islington in London, where it was shown until October 2005.

Several elements are juxtaposed in the austere gallery space. A simple likeness of the bullet-proof glass cell in which Eichmann sat for his 1961 trial in Jerusalem. A roller-conveyor on which the visitor can put copies of a newspaper and watch them proceed to the increasing and disorderly pile at the other end: Eichmann was described as the main conveyor-belt in the deportation of Jews and others across Europe to their degradation and death. The far wall of the gallery is stacked from floor to ceiling with bundles of newspapers: a beautiful sight. An unobtrusive print of Paul Klee's *Angelus Novus* is pinned to the wall. A small reading table with a copy of Hannah Arendt's series of New Yorker reports from the trial, Walter Benjamin's Illuminations with Arendt's introduction, the Generali book on Metzger and other publications. On the wall are the names of the places where Arendt, Benjamin and Eichmann died: NEW YORK PORT BOU JERUSALEM.

Complexity enough, and the fog of history too. In September 1940 Benjamin was in a group following a different conveyor-belt (for some to relative freedom) south across France to the Spanish border, which they reached at Port Bou on the Mediterranean coast, where Benjamin died. An internet search on Walter Benjamin and Port Bou gave over 900 links. The first ten or so, all sensible-looking sites, reveal:

Benjamin died on 26 or maybe 27 September.
He killed himself with an overdose of morphine, or died of a cerebral haemorrhage as on the death certificate – or perhaps it was both.
This was when he was surrounded by the German army, or on being told by Spanish officials that the group would not be allowed into the country.
The rest of the group was allowed into Spain the next day, perhaps because of his death, or maybe they would all have been let in anyway.
A suitcase of Benjamin disappeared, and may have contained his final work, on the Arcades Project, finished or not.
There was a catholic burial at Port Bou on 28 September for one Benjamin Walter.
In 1993 a memorial to Benjamin was built in Port Bou and in 2001 an international

conference was held there on his work, life and death.

Two of the internet sites looked at were in German, and the automatic translation of Port Bou was haven, a place of safety for travellers in a storm. Haven it was not for Benjamin.

Gustav Metzger, diminutive, mild, selfless, stateless, without possessions, tenacious, concerned for the micro and the macro, cheerful and optimistic, has achieved this new fusion of art with political and social analysis through depiction and documentation. Most other contemporary art looks pretty empty to me by comparison. Sadly there seems to be no plan for *Eichmann and the Angel* to be seen elsewhere after it closes at the Cubitt.

OTHERS

In August 1918, shortly before his return to the trenches of northern France, where he died in October, Wilfred Owen was drafting the preface to a planned book of poetry. He wrote:

Above all I am not concerned with Poetry
My subject is War, and the pity of War.
The Poetry is in the pity.
... All a poet can do today is warn. That is
why the true Poets must be truthful.

Gustav Metzger is as truthful in his work as anyone can be.

In his 1939 essay on Charles Dickens, George Orwell wrote that "Dickens attacked English institutions with a ferocity that has never since been approached." Later he asserts that "All art is propaganda. ... On the other hand, not all propaganda is art." In the last sentence of the essay Dickens is described as "a man who is *generously angry* ... a free intelligence." Yes, but with Metzger it is not just the institutions but attitudes and actions right across our half-crazy society that come under scrutiny.

Introducing Metzger at Computer Graphics 70, and knowing little about his work not related to computing or just who was in the audience, I said that I thought his work would be remembered after the rest of us there were forgotten. Knowing so much more about him, partly thanks to the works reviewed above, I feel secure in this prediction.

Words and photographs Alan Sutcliffe

Eichmann and the Angel was shown again at the Kunsthalle, Basel from January to March 2006 and at the Zacheta National Gallery of Art in Warsaw from January to March 2007.

This article was written in 2005 for PAGE 62, but that became the special Terminate CACHe issue, and the break in publication since then has meant that it could not appear till now.

Variations on an Original Algorithm

In the early days of the Computer Arts Society, around 1970, there was talk, as there is still, of algorithms that are simple to define but the outcome of which defies intuition. It seemed easier to talk about them than to invent them. One that I thought of then is called Skip and Divide. Over the years I have made several graphics using it, described in this article. Its close relationship to the Josephus problem is also explained.

One Dimensional Forms

In its original form it applied to the division of a line segment into an increasing number of sections. To start with, the whole line segment or interval is the only section. Starting, say, from the left, alternately skip and divide successive sections. The first section is defined as succeeding the last. So initially the whole line is skipped and then it is divided into two equal parts. The current state is displayed each time the end of the line is reached.

The first nine generations of this unfolding process are shown below, numbered on the left. The numbers on the right show how many sections there are in each generation. Beside these linear representations is generation 8 in circular form. The start position is at the bottom, and the direction is clockwise. The correspondence to the linear form is easy to see. Initially these were the only representations that I made, though through more generations. Generation 8 is also shown below as a rhythmic pattern in eight bars. I have not used this in any composition.

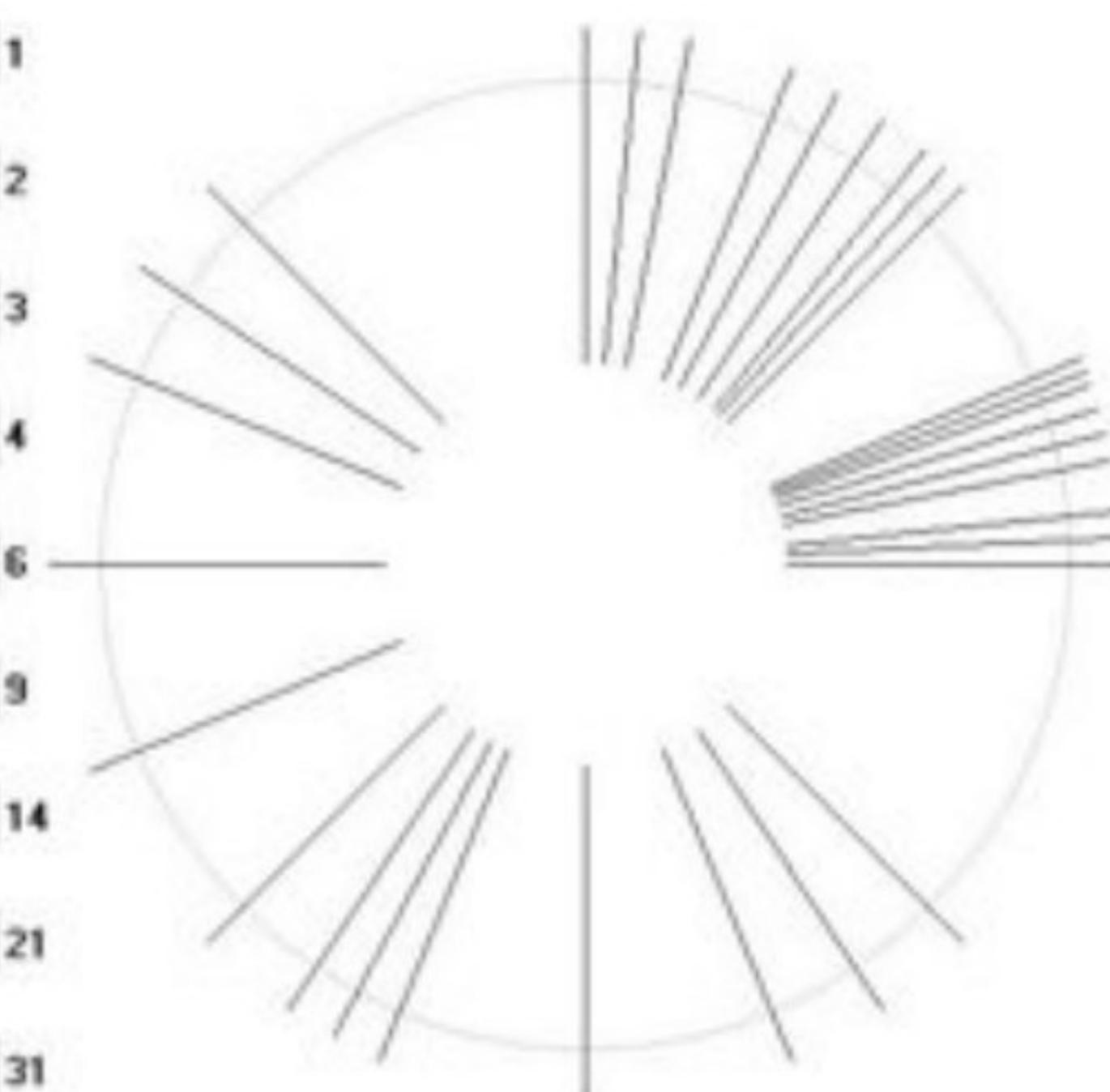
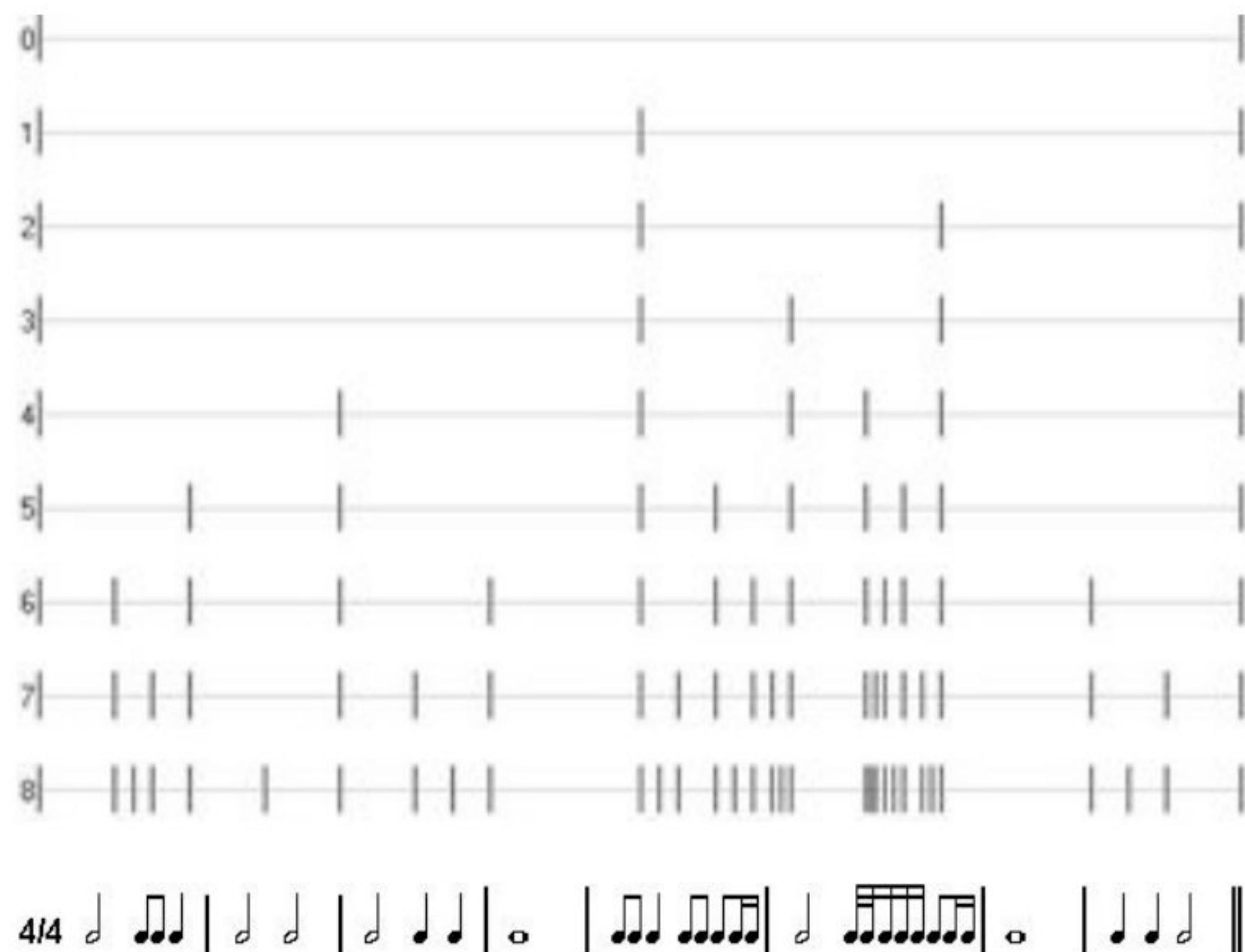
The number of sections in a generation depends on the mode - skip or divide - at the start of the generation, and the number of sections in the preceding generation. An even number of sections, $2n$, gives $3n$ sections in the next generation, since each pair of sections give rise to 3 sections, regardless of the initial mode. An odd number of sections, $2n + 1$, starting in skip mode gives $3n + 1$ sections as there are $n + 1$ new divisions, while starting in divide mode gives $3n + 2$ sections in the new generation.

It was looking at the number of sections in each generation that years later I saw the connection to the Josephus problem - see the panel on the next page.

Notice the accumulation of sections in the third quarter. In generation 8, of the 31 sections 17 are in the third quarter. This will persist as each pair of adjacent sections in a generation give three sections in the next generation.

Problem and Proof

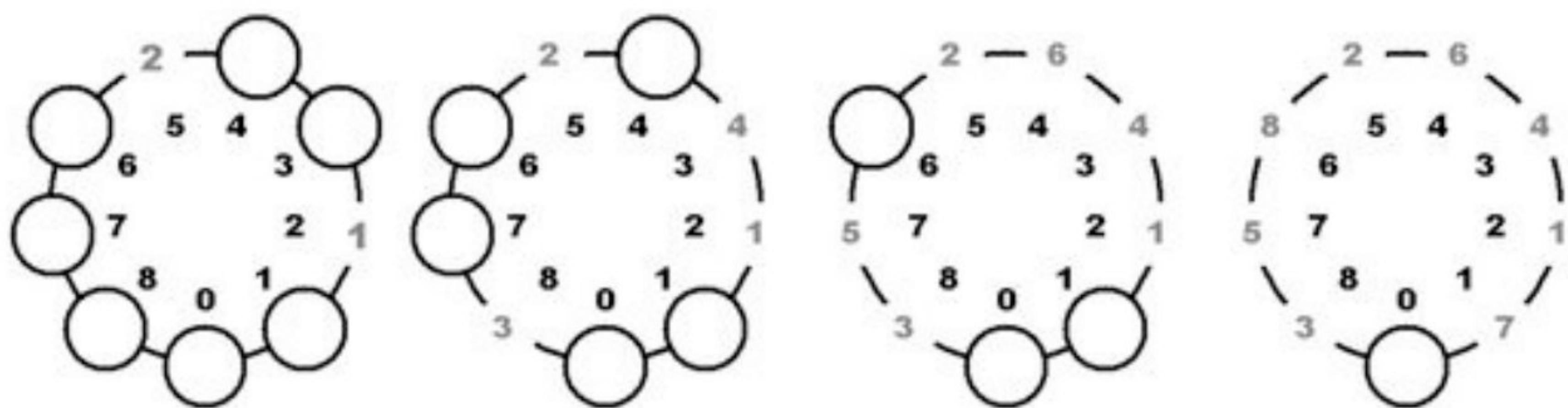
In 1972 the CAS held a course at the Electronic Music Studio in Stockholm, thanks to the director, Knut Wiggen. Lambert Meertens was there: he had an entry in the IFIP 68 computer composed music contest and ran CASH, the CAS branch in Holland. He worked at the Mathematical Centre in Amsterdam. I explained to him a problem in Skip & Divide: could a section continue undivided indefinitely. The next morning he showed me the proof that every section will eventually be divided. But writing this I could not remember his proof.



The Josephus Problem

Josephus was a first century AD Jewish soldier and historian. In the mathematical context the story is that, along with other rebels against the empire, he was trapped in a cave by Roman forces. Rather than surrender the group decided to kill themselves. Standing in a circle every third man was to be selected and despatched. But Josephus did not wish to die and so had to work out which position in the circle to take so as to be the last man standing. How he escaped the Romans is not explained, but he lived to tell the story. Accounts differ as to the number of rebels but the majority say 40 or 41. "Josephus Problem" scores about 12,900 hits on Google.

Josephus elimination is the reverse of Skip & Divide insertion. For every pair of sections in a generation, Skip & Divide adds a third. Josephus removes one in three, starting from the end of a completed generation and going in the opposite direction. The lengths of the sections produced by Skip & Divide are not relevant.



The illustrations above show the progress of elimination for an initial group of nine men or of sections. For easy comparison with the Skip & Divide illustrations, which are read clockwise, these for Josephus are read anti-clockwise. There are two eliminations from one diagram to the next. On elimination of a position, the small circle is replaced by the number showing the sequence of elimination. The inner ring of numbers show the original ordering. In the left-most circle positions 0 and 1 have been skipped and position 2 is the first to be eliminated and position 5 is the second to go. There are two further eliminations shown at each stage, moving to the right, until only position 0 remains. With nine rebels Josephus would have to stand in the first place to survive. In general, if the original number is the total of sections in a Skip & Divide generation, 1, 2, 3, 4, 6, 9, 14 and so on, then Josephus would have to stand in the first or second position to be the lone survivor. Whether it is first or second position depends on whether, in the corresponding Skip & Divide generation, the final section is skipped or divided.

There is a related correspondence between the order in which divisions appear in Skip & Divide, and the order in which Josephus elements are eliminated. In generation 4 (see the first illustration in the main article) with the 9 divisions appear in the order 0 6 4 1 7 3 5 8 2, the right-most division being the second to appear. The reverse order of Josephus elimination is 3 5 8 2 6 4 1 7 9, reading from the last illustration above.

The Josephus problem is intriguing because the rule is simple but the outcome is not easy to see by intuition, just as for Skip & Divide.

In serious history the life story of Josephus is more complex. By the age of 26 he was a delegate for the Pharisees to Nero in Rome. At age about 30 he was governor of Galilee at the time of the Jewish rising against the Romans in AD66, and held out for 47 days against the siege at Jotapata. Only four years later, after imprisonment, he was with the Roman army at the siege of Jerusalem. He appears to have spent the last 30 years of his life in Rome, writing histories of the Jewish people. He died in AD100. Compare his life with that of the twentieth century Jewish writer Walter Benjamin - see **Gustav Gustav** on page 4 of this issue.

I turned to a current mathematical friend, Dr David White, formerly of Reading University. I explained the problem over the phone and he replied with his proof the following day. I believe it is the same as that given by Lambert Meertens. It depends on applying the rules given above for the number of sections in a generation to any section in any generation.

If the mode is divide at the start of the section then there is no problem. If the mode is skip and there are at that point an odd number of sections then this section will be divided in the next generation. With an even number of sections, $2n$, there will be $3n$ sections when this section is reached in the next generation. This number may still be even but $3n$ is divisible by 2 one time fewer than $2n$. So however many times $2n$ is divisible by 2 it will eventually be reduced to an odd number, and the section will be divided in the next generation.

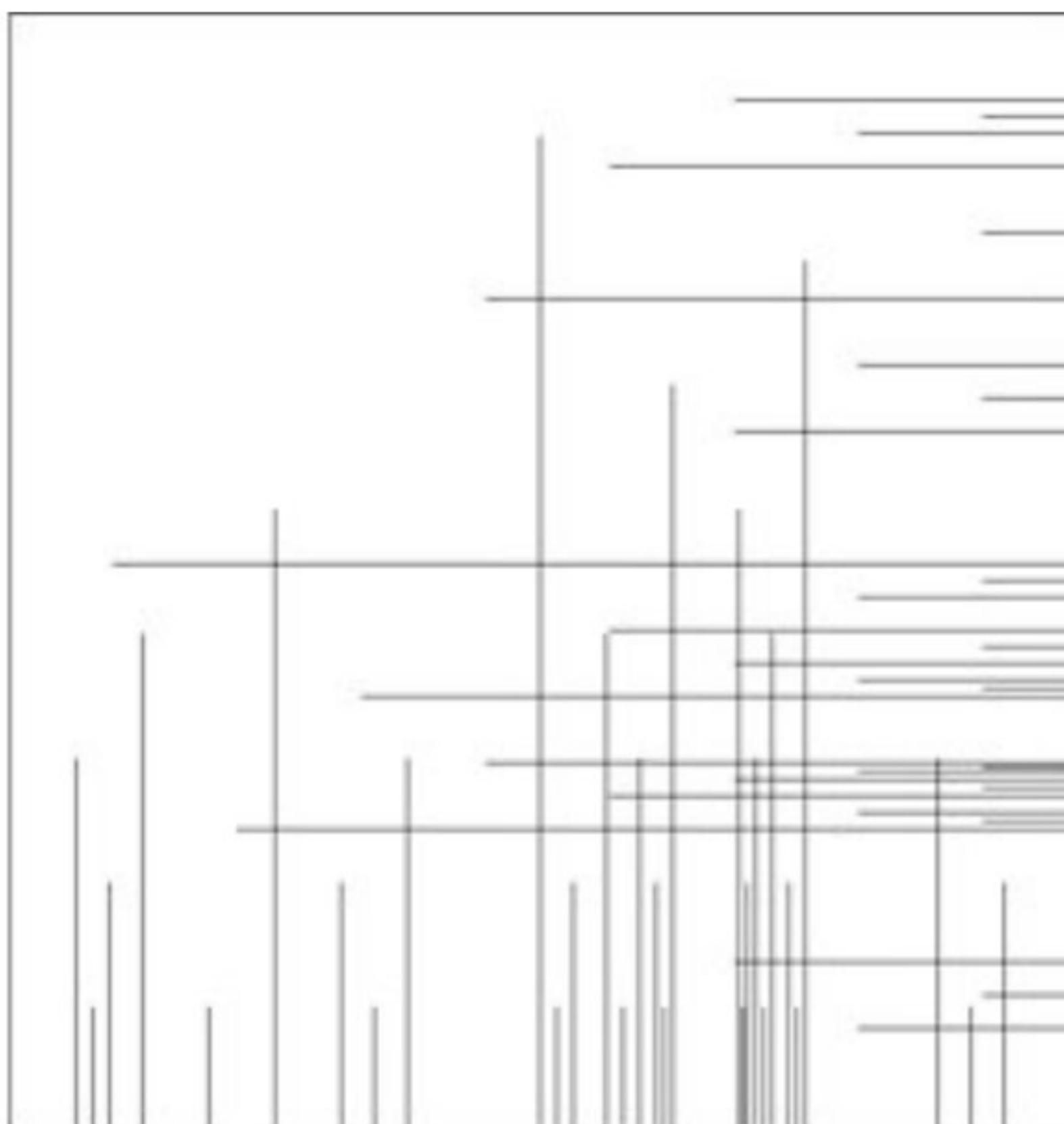
Complexity and Simplicity

David also pointed out that there are versions of Skip & Divide where sections remain forever undivided. Start with a circle divided into two sections. Skip and divide alternate sections but instead of dividing into two sections each time, divide into three parts. Try it. You will soon see that it gives a very regular pattern, again perhaps defying intuition, but by its simplicity.

One and a Half Dimensions

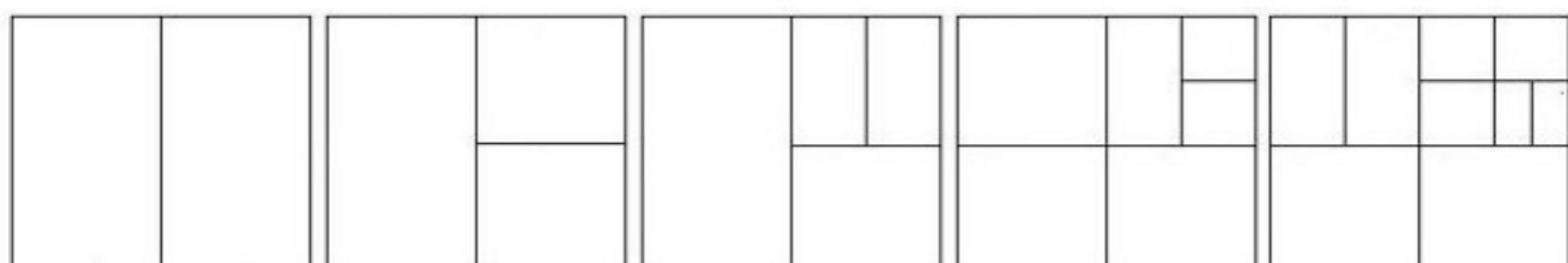
In 1973 I wanted to give John Lansdown a graphic to mark our years of collaboration in the Computer Arts Society and so made a 2-dimensional version of Skip and Divide, a re-creation of which is shown alongside. For several years it hung in the Lansdown's flat, but recent discussions with Dot Lansdown prompted by the CACHe project, led us to think

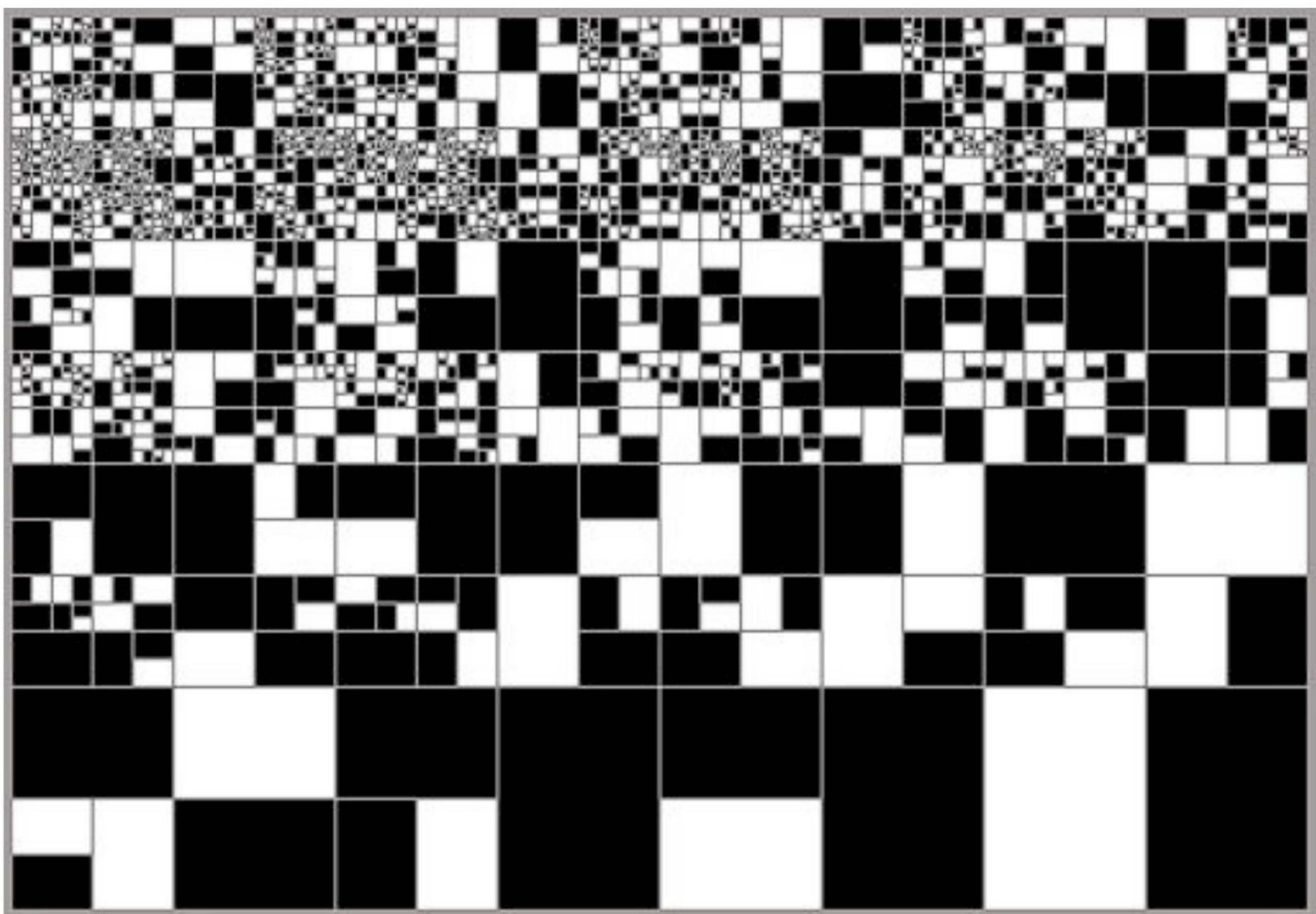
that the work was lost. So it was a happy surprise at the V&A reception (see the front cover and page 2) to see it on display as part of the CAS collection. My belated and undeliverable thanks to John Lansdown, for putting this small work into the collection. The structure of the piece and its use of the linear forms above should be clear.



Two Dimensional Forms

Not satisfied that this was a truly 2-dimensional form, but just linear ones disposed at right angles, I devised the outline representation shown below, with a 1973 original below that. Starting with a square, each rectangle is divided, when it is selected, vertically into equal rectangles if it is a square, or horizontally into equal squares otherwise. A convention is needed to order such new pairs of areas when they are to be skipped or divided at the next generation: one will be skipped and the other divided. Left precedes right and higher precedes lower in each pair.





The 1973 version uses several generations though I am not now able to say which. Once the outline is complete areas are then filled alternately black and white. A banner version was made on 8 or 9 sheets of continuous printer paper. Above is a more elaborate version done 20 years later for display in the London offices of the British Computer Society. The society has now moved to a new building where the walls and partitions are not suitable for picture hanging.

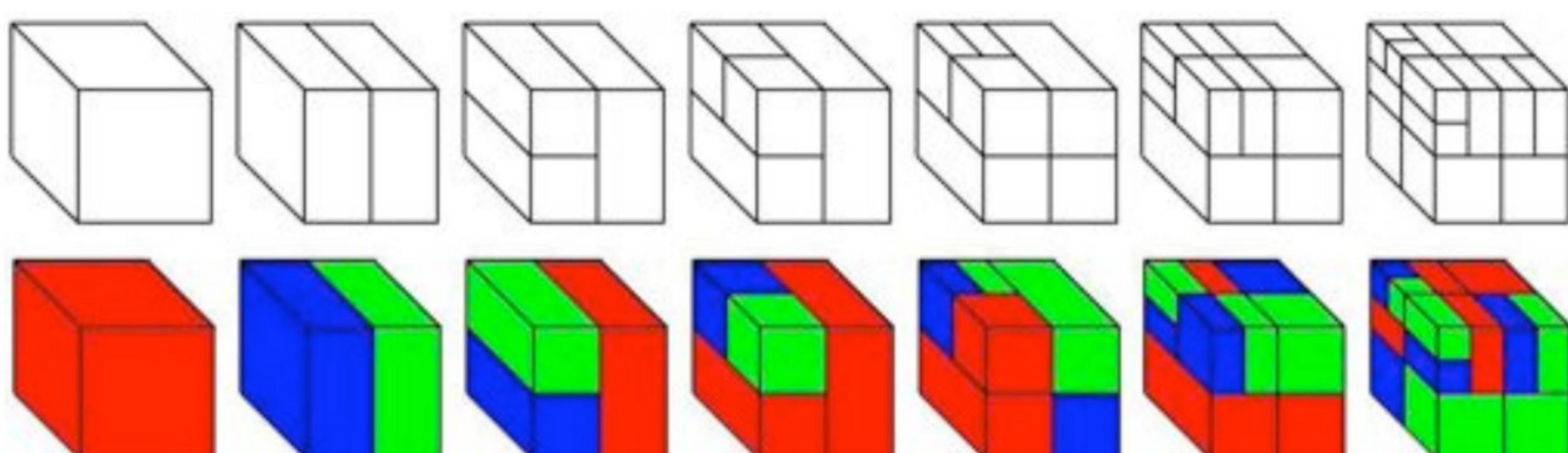
Sixteen generations are shown, starting with generation 1 at the bottom right, which is divided into a black and a white area. Although the viewer might follow the detailed progress of Skip & Divide across the work I consider this to be a purely technical device to produce a design with merit only in its appearance. But people should take from it what they can, and if some of this is mathematical interest then I cannot object

A Form in Three Dimensions

For this article I have attempted a representation in 3 dimensions, shown below. I have chosen a view of the cubes in which all the sections can be seen except in the last cube on the right, generation 8, where one is hidden at the back: only 13 of the 14 divisions of generation 8 can be seen.

So the underlying form is the same in all these representations regardless of the number of dimensions. Elements are alternately skipped and divided generating just the same number of new elements in each generation. The endless variety of other schemes of skipping and dividing I leave to others. After nearly 40 years of visiting this algorithm it's time to think of another.

Alan Sutcliffe



Herbert W Franke at 80: a Tribute from the Computer Arts Society

Through his writings, scholarship and his own graphics, Herbert Franke has publicised, documented and so supported many throughout the world who have worked, and many more working now, in computer graphics and related areas

His 1971 book *Computer Graphics - Computer Art* was a landmark, being the first to give a history of the topic with truly international coverage, and it did much to improve the standing and understanding of the validity and importance of field. A revised and enlarged edition appeared in 1985

His assiduous collection of works over many years now adds wonderfully to these achievements, making this rich resource open to public enjoyment following its recent acquisition by Kunsthalle Bremen.

All this complements and amplifies the work of the Computer Arts Society (CAS), whose members are among those to have benefited from his work

In the February 1972 issue of PAGE, the CAS bulletin, Franke wrote about Apparative Art, art that uses apparatus for drawing and graphical treatments, giving a wise warning to members of the society not to encourage, even unintentionally, the separation of computer

artists from representatives of other related areas, such as aparative art, and not to use computers exclusively when simpler means will suffice for part of a process

The wide coverage of his many other publications demonstrates the breadth of his vision

We are very happy to pay this tribute, on behalf of the Computer Arts Society, to celebrate the 80th birthday of Herbert Franke

As a mark of our admiration for his lifetime achievements, the Computer Arts Society is awarding honorary life membership to Herbert W Franke

Paul Brown, chairman
Alan Sutcliffe, president

The award will be presented at the opening of the exhibition of the Franke collection at the Kunsthalle, Bremen on Saturday 16 June 2007. See page 15 for details of the exhibition and related events

The English translation of *Computer Graphics - Computer Art* was by Gustav Metzger

Meetings and events

Nove Tendencije and Bit International

From 1961 to 1973 Zagreb in Croatia was a centre of activities for new arts using technology, in the later years mainly computers. The two main manifestations were the exhibitions Nove Tendencije 1 to 5 and the substantial publication Bit International. Bit 1 has the title *the theory of informations and the new aesthetics*. Bit 7 is called *dialogue with the machine*. Confusingly there were 7 issues of Bit, but two were double issues so that Bit 7 was followed by the final Bit 8/9 devoted to television. These activities are the focus of a new exhibition and a related new publication.

THE EXHIBITION

The exhibition Bit International, curated by Darko Fritz, is at in the Neue Galerie in Graz, Austria, 28 April - 17 June 2007 and at the ZKM in Karlshruhe, Germany, in 2008.

It presents works that were exhibited and published in Zagreb within the New

Tendencies exhibitions with the focus on the computer-generated works: graphics, poems, theatrical scripts, constructions and more.

THE BOOK

bit international
[Nove] tendencije
Computers and visual research
Zagreb 1961 - 1973

This is the title of the book. There are essays by Peter Weibel, Ješa Denegri and Margit Rosen. The second half of the book is a well illustrated chronology of works in the original exhibitions. Many of the names and some of the works that appear are also seen in the Franke and CAS collections featured elsewhere in this issue of PAGE

There is said to be an edition in English but currently your editor only has the version in German. It is hoped to have a review in a future issue of PAGE.

Colour in Computer Art

The Computer Arts Society presents an afternoon joint meeting with the Colour Group
<http://www.city.ac.uk/colourgroup/>

13:30 for 14.00 – ends 16:30
Wednesday 20 June 2007

British Computer Society
The Davidson Building
5 Southampton Street
London, WC2E 7HA

Map at:
<http://www.bcs.org/upload/img/londonsscolour.jpg>

Mutating Colour

William Latham, Goldsmiths College
University of London

William Latham will discuss the use of colour in his Computer Artworks during the period 1987 to 1993 at IBM UK Laboratories & more recently on the Mutator 2 Project from 2005 at Goldsmiths College (University of London) using "real world" DNA data input from the Bioinformatics Group at Imperial College. Originally trained as artist he will explain his approach to colour from his very early computer artworks through to the DNA automatically generated colour schemes in his multi-coloured recent animated films.

From 1987 to 1994 William Latham worked for IBM in their Advanced Computer Graphics and Visualisation Division. He was co-author with Stephen Todd of the book "Evolutionary Art and Computers", Academic Press. In April 07 he became a Professor in the Computing Department at Goldsmiths College. He continues as CEO of Games Audit.

Webpage <http://www.doc.gold.ac.uk/~latham>

Colourfield: an evolutionary ecosystem of colour

Jon McCormack, Centre for Electronic Media Art (CEMA), Monash University, Australia

In biology, evolutionary synthesis is a process capable of generating unprecedented novelty, i.e. it is creative. It has been able to create things like prokaryotes, eukaryotes, higher multicellularity and language through a non-teleological process of replication and selection. Colourfield is a simple experiment in machine assisted creative discovery. It uses the metaphor of an adaptive ecosystem. A population of colours exists in a 1-dimensional world, and the colours are "grown" from a gene that expresses natural weights towards neighbouring colours along with an innate "personal" colour.

Jon McCormack is an Electronic Media Artist, co-director of the Centre for Electronic Media

Art (CEMA) and Lecturer in the School of Computer Science and Software Engineering, Monash University, Melbourne, Australia. Impossible Nature, a book about his work, was published in 2004.

Webpage:
<http://www.csse.monash.edu.au/~jonmc/>

The Painting Fool - a First Look

Dr. Simon Colton, Imperial College, University of London

I'm interested in the question of what it means for a piece of software to be creative in the visual arts. In the talk, I will outline the notion of the creative tripod, where programs have to exhibit signs of skill, appreciation and imagination in order to be taken seriously as creative individuals.

Dr. Simon Colton is a lecturer in Artificial Intelligence at the Department of Computing, Imperial College, London. Firstly as a hobby, and more recently as work for Machine Creations Ltd., he has developed various pieces of graphics software to explore the question of computational creativity in the visual arts.

Webpage <http://www.doc.ic.ac.uk/~sgc/>

Colour, Symbol and Ambiguity

Paul Brown, University of Sussex

I am not an intuitive colourist and tend to use colour in my work in a symbolic sense to "tag" different areas of an image and differentiate the image plane.

In this talk I will discuss two recent time-based generative works – 4^16 – and – 4^15 Studies in Perception. In the former I attempted to find a set of four colours that would emphasise the ambiguity of a geometry that could be interpreted as having either a horizontal/vertical or diagonal construction. In the latter the colour (and most of the other controls governing the work) are random. Here I have been surprised by the consistency and quality of the colour in contradiction to my initial expectation that the work would often devolve into mud.

Paul Brown is an artist and writer who is based on the Sunshine Coast in Queensland, Australia. His pioneering work in the computational and generative art dates back to the early 1970's. He is currently the Chair of the Computer Arts Society and a visiting professor of art & technology at Sussex University where he is working on a project to evolve a robot that can draw.

Webpage: <http://www.paul-brown.com>



COMPUTER ARTS SOCIETY

British Computer Society Specialist Group

Bringing together artists and technologists
Exchanging techniques and ideas
Formulating needs for support
Helping to get works known
Exploring new forms

ABOUT THE COMPUTER ARTS SOCIETY

Aims

The Computer Arts Society (CAS) promotes the creative uses of computers in the arts and culture generally

It is a community of interest for all involved in doing, managing, interpreting and understanding information technology's cultural potential

Membership & fees

Membership is open to all who are interested in the aims and activities of the group

There is an optional annual contribution of £10 (€15 or \$20 overseas) for which members receive a printed copy of each issue of PAGE

The British Computer Society (BCS)



The CAS is a Specialist Group of the BCS

The CAS receives funding from the BCS

Website

www.computer-arts.society.org

Publication

PAGE the Bulletin of the Computer Arts Society appears quarterly and can be downloaded from the CAS website

Archiving computer arts

The CAS was active from 1968 until the mid 1980s

There are significant archives of material from this era, mainly stored in homes and offices of people then active in the group

The CAS is worked closely with CACHe, a project in the Art History Department of Birkbeck, University of London, documenting UK computer arts in the years to 1980. CACHe ended formally in 2005 but the work continues

This leads to a wider interest in the archiving, study and presentation of computer arts from earlier years

Present & future computer arts

With so many novel and exciting developments in the creative uses of computers in the arts the society will continue its original aims of bringing together those active in this area

Collaboration

The society plans to hold joint events with other BCS Specialist Groups and to collaborate with other organisations

Education

The CAS plans to have an educational role in making students more aware of early work in computer arts and in helping artists to use computers creatively

CAS COMMITTEE

Chairman

Paul Brown paul@paulbrown.com

Vice-chairman

Dr George Mallen george@ssl.co.uk

Treasurer

Dr Alex Zivanovic alex@zivanovic.co.uk

Minutes Secretary

Dr Nick Lambert n.lambert@hist-art.bbk.ac.uk

Webmaster

Stephen Boyd Davis s.boyd-davis@mdx.ac.uk

Editor of PAGE

Alan Sutcliffe nsutcliffe@ntlworld.com
4 Binfield Road Wokingham RG40 1SL
+44 (0) 118 901 9044

Catherine Mason

catherine.mason@dsl.pipex.com

Christos Logothetis christos@logothetis.co.uk

John Sharp sliceforms@yahoo.co.uk

Sue Gollifer S.C.Gollifer@bton.ac.uk

Dr Tony Mann A.Mann@gre.ac.uk

Tony Pritchett tony@agmp.net

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Ex Machina - Computer Graphics before 1980

17 June to 2 September 2007

The Franke Collection and other Foundations at the Kunsthalle Bremen

Dedicated to Herbert W. Franke on his 80th Birthday.

The pairing of computers and art has still not been sufficiently portrayed, although digital art has existed for over 40 years. Therefore, the Kunsthalle Bremen has been researching, collecting, and presenting early computer art for quite some time. The exhibition on the occasion of the 80th birthday of the pioneer Herbert W. Franke will show a representative cross-section of the nineteen-fifties, sixties, and seventies - all the way up to the founding of *Ars Electronica* in 1979. Roughly 300 of the now approximately 1000 computer graphics included in the Bremen collection impressively illustrate the path from the analogue to the digital age.

The Catalogue

Accompanying the exhibition, there is a German/English catalogue of the exhibition's inventory, including 407 catalogue numbers and contributions from Ralf Bülow, Herbert W. Franke, Wulf Herzogenrath, Christoph Klütsch, Barbara Nierhoff-Wielk, Heike Piehler as well as Margit Rosen/Peter Weibel, approximately 500 pages with over 80 coloured and around 450 black-and-white illustrations, price € 42.

The Artists

Artists represented in the exhibition are Walter Heinz Allner/H. Philip Peterson (USA), Kurd Alsleben (D), Peter Balla (H), Manuel Barbadillo (E), Klaus Basset/Willi Plöchl (D), Wolfgang Bäumer (D), Beck/Jung (S), Otto Beckmann (A), Hermann Bense (D), Frank Böttger (D), Harold Cohen (USA), Roger Coqart (B), Charles A. Csuri (USA), William A. Fetter (USA), Herbert W. Franke (D), Roland K. Fuchshuber (D), David R. Garisson (USA), Karl Gerstner (CH), Theo Goldberg/Günther F. Schrack (CDN), Hein Gravenhorst (D), Julius Guest (A), Sozo Hashimoto (J), Ernst Havlik (A), Grace C. Hertlein (USA), Herve Huitric/Monique Nahas (F), Kurt Ingerl (A), Mihail Jalobeanu (RO), Kammerer-Luka/Jean-Baptiste Kempf (F), Miroslav Klivar (CZ),

Kenneth C. Knowlton (USA), William J. Kolomyjec (USA), Peter Kreis (D), Ruth Leavitt (USA), Tony Longson (USA), Aaron Marcus (USA), Tomislav Mikulić (AUS), Manfred Mohr (USA), Vera Molnar (F), Frieder Nake (D), Georg Nees (D), A. Michael Noll (USA), R.D.E. Oxenaar (NL), Torsten Ridell (S), Sylvia Roubaud (D), Annamaria & Marzio Sala (D), Reiner H. Schneeberger (D), Ernst Schott (D), Chihaya Shimomura (J), Bruno Sonderegger (CH), Thomas Michael Stephens (USA), Gerhard Stickel (D), Kerry Strand (USA), Alan Sutcliffe (UK), Klaus Thomas (D), Roger Vilder (F), Aron Warszawski (D), Rolf Wölk (D), Edvard Zajek (USA), Joseph Ziegler (USA), Vilko Zijlak (CRO) and Anton Zöttl (D).

Related activities and events

There will be public guided tours, lunchtime lectures, and an art forum for senior citizens.

Tuesday 19 June, 8 p.m.

Wall-Saal of the central library.

Erde, Mars, Unendlichkeit – Vorstoß in unbekannte Welten

Prof. Dr. Herbert W. Franke will read from his new science-fiction novel *Flucht zum Mars*, and subsequently talk with the physicist and science writer, Prof. Dr. Wolfgang Dreybrodt from Bremen.

Wednesday 20 June, 5:30 p.m.

Kunsthalle Bremen.

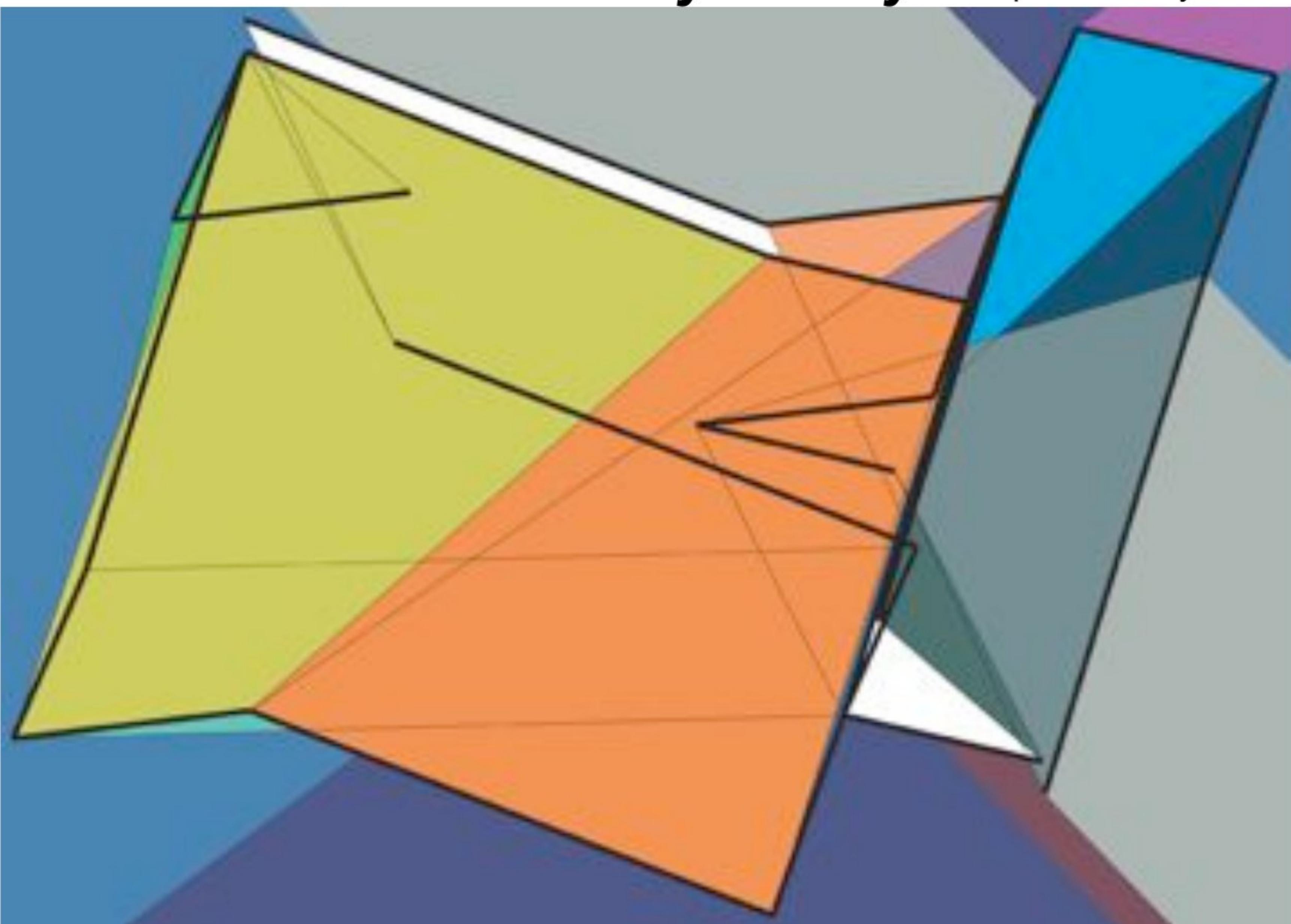
Von Menschen und Maschinen: Das Ich, die Emotion und die Kunst

Scientific discussion with Prof. Dr. Eckart Altenmüller, Prof. Dr. Claus Pias and Prof. Dr. Herbert W. Franke

Joint project

Exhibition *Sixteen/Thirty-Two* (17 June to 17 July 2007) Galerie für Gegenwartskunst (Gallery for contemporary art) Barbara Claassen-Schmal. The show presents Computer Art from Bremen.

Kunsthalle Bremen Am Wall 207 28195 Bremen www.kunsthalle-bremen.de
Manfred Mohr - broken symmetry 24 April to 1 July 2007



Manfred Mohr P-671-A 2003

Courtesy [DAM] Berlin

A poster for the Darwin Summer Symposium 07, held at The Music Hall, Shrewsbury, from 11-14 July 2007. The poster features a central illustration of a skeleton standing with arms outstretched, set against a yellow background. Text on the poster includes:

11-14 JULY DARWIN SUMMER SYMPOSIUM 07
BATTERIES NOT INCLUDED MIND AS MACHINE

THE MUSIC HALL,
SHREWSBURY

Friday 13th
(Registration) 8.30pm - 9.30pm
GEORGE DTYSON
'DARWIN AMONG THE MACHINES'
CURATOR PAUL BROWNS

LUNCH & REFRESHMENTS 12.30pm
4.30pm Bookings Essential

AT THE OMH

Wednesday 11.30pm
BLADE RUNNER DIRECTORS CUT

Saturday 14. 11.30pm
THE IRON GIANT
4.30pm, 6.45pm, 8.45pm to Lease

THEIRSTAY 12-FOUR EVENT
ROBOTICS SCIENCE IN THE SQUARE

Box Office 01743 281 281
Details online at: www.darwinshrewsbury.org

Supported by the
Shropshire County Fund

Poster for the Darwin Symposium Shrewsbury July 2007