AIMS AND MEMBERSHIP

The aims of the Society are to encourage the creative use of computers in the arts and allow the exchange of information in this area.

Membership is open to all at £1 or $3 per year; students half price. Members receive PAGE and reduced prices for Computer Arts Society public meetings and events. The Society has the status of a specialist group of the British Computer Society, but membership of the two societies is independent.

Libraries and institutions can subscribe to PAGE for £1 or $3 per year. Extra copies will be sent to the same address at half price. No other membership rights are conferred and there is no form of membership for organisation or groups. Re membership, subscription, circulation and information, write to Alan Sutcliffe.

COMPUTER ARTS SOCIETY ADDRESSES.

Chairman Alan Sutcliffe ICL Brandon House Bracknell Berkshire
Secretary John Lansdown 50/51 Russell Square London WC1
Editor of PAGE Gustav Metzger BM/Box 151 London WC1

PAGE 5

BULLETIN OF THE COMPUTER ARTS SOCIETY

NOVEMBER 1969 SIXPENCE

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PAGE aims to print information on activity in computer art. You can assist by sending news, publications and comment. Stick a copy (or photo copy) of the bulletin on a notice board. This number is designed by Criton Tomazos. Born 1940 Cyprus. Studies in Cyprus, Egypt and England. Qualified architect. Writer and painter. Lives in London. Bibliography: Bomb Culture by Jeff Nuttall, London, 1968.

COMPUTER-KUNST

This exhibition titled On the Eve of Tomorrow takes place 19 October - 12 November in the Aegidienkirche, Hannover. The show is accompanied by a series of lectures and films. A nicely presented catalogue has been produced and can be obtained from the organiser; Kathe Schroder, 3000 Hannover, Plathnerstrasse 27, Germany. Phone 0511/81 42 90

ZAGREB

Vladimir Bonacic, Zagreb, Marc Adrian and collaborators, Vienna, and the group Compos 68, Utrecht, have been adjudged the outstanding exhibitors in the Computers and Visual Research exhibition. Their work will be featured in Bit International, they will get a show in Zagreb, and time on a Zagreb computer. The information bulletin No 14 is useful, giving the addresses of all exhibitors, and a bibliography on the show. A complete bibliography will appear in a future issue of Bit International. Please help to complete this bibliography. The Galleries of the City of Zagreb, Katarinin trg 2, Zagreb, Yugoslavia.

. . . . AND COMING

Several young English members of the Society visited the United States during the summer. An interesting report was received from Lesley Sunderland (Lelly to her friends), who has just started in the textile design department, Royal College of Art, London. Miss Sunderland had a number of contacts with members of Experiments in Art and Technology, including David Macdermott, head of EAT West Coast (Los Angeles), and Merlin Stone, San Francisco Bay Area organiser. (T.M. Crisp and Tony Wright also write enthusiastically about Merlin Stone.) Society member Richard Friedman at the Lawrence Radiation Laboratory near Berkeley University was helpful, and had already given other Society members a guided tour of the Laboratory in the course of the summer. UCLA at Los Angeles appears to be a hive of activity in computer art. Miss Sunderland had a conversation with John Stemura, the first to receive an MA in computer art from this university: 'Can you imagine that in England?' is her touching comment.

COMPUTERS IN ARCHITECTURE

Visiting the Institute for Light Weight Structures (IL), Director Frei Otto, University of Stuttgart, I was struck by the enormous amount of work needed to find out the stresses in each node of tensile structures, etc. An elaborate real model is essential and this takes several man-weeks of work. Very little has been done to apply computers in any way to convey this information in a simpler way. Professor Makowski at Surrey University has done very important computerized calculations on space frame structures. I would be interested to find out who is applying computers to calculate developing surfaces in pneumatic structures and stresses in nodes on tensile structures. J. Mena, 32 Ainger Road, London NW3.

AMERICA GOING . . . . .

The Computer Arts Society's Chairman and Dynamo, Alan Sutcliffe, is visiting North America from mid-October to the beginning of December. On 16 and 17 October he will visit Dr. Max Mathews and others at Bell Telephone Laboratories, Murray Hill, NJ, to see the MUSIC V project. From 20 to 22 October he is attending an ACM conference on Operating Systems at Princeton. He hopes to spend a day with Herbert Brun at Columbus, Ohio, on his way to the University of Illinois, where he will stay till December 3rd in the Experimental Music Studio, with Dr. James Beauchamp. On 4 and 5 December he will visit Professor Leslie Mezei in the Computer Science Department, University of Toronto. During November Alan Sutcliffe's address will be: c/o Experimental Music Studio, School of Music, University of Illinois, Urbana, Illinois 61801, USA.

INTERPLAY

This project for an audio-visual environment appropriate for a world or trade fair, for use by older children or younger adults, was shown at the 6th Paris Biennale in October. It was carried out by Stroud Cornock, Bradley Faine, David Wood, Nick Nealson and Mike Brackenbury, and sponsored by City of Leicester Polytechnic.

BEANO REPORT

The semi-annual reunion and mushroom hunt on 4 October was a great success although no fungi actually certifiable as mushrooms were collected. Suggestions for the next beano would be welcome.

PAGE AN ANNOUNCEMENT

Exactly in the middle of the American Society of Cybernetics Third Annual Symposium in October occurred Moratorium Day. Appropriately the theme of the Symposium was Cybernetics in the Seventies and Conflict Resolution.

As one goes through specialist periodicals, for instance Computers and Automation or Datamation, it becomes evident that some computer professionals are becoming increasingly conscious of their social responsibilities. This subject was raised several times at DATAFAIR 69. Like the build-up of concern over pollution, this agitation is bound to grow.

The Computer Arts Society has recently agreed to the publication of a specially enlarged issue of PAGE devoted to the subject of the social responsibilities of the computer specialists. The issue will deal with threats posed by the computer. The computer is only a segment of a society and technology inundated with danger. A discussion of these issues is particularly appropriate in the context of an art/science/technology link presented by our Society.

The special number, PAGE 8 will appear March/April 1970. We would be glad to hear from anyone wishing to contribute to this number, and request information, news items, and other relevant material.

seasmell
a salty rose
vows

COMPUTER ART: COLLECTED WRITINGS BY A. MICHAEL NOLL.

1. Human or machine: a subjective comparison of Piet Mondrian's 'Composition with lines' (1917) and a computer-generated picture (The Psychological Record, Vol. 16, no. 1, Jan. 1966)
2. The digital computer as a creative medium (IEEE Spectrum, Oct. 1967)
3. Computers and the visual arts (Design & Planning, no. 2)
4. A computer technique for displaying n-dimensional hyperobjects (Communications of the ACM, vol. 10 no. 8, August 1967)
5. Stereographic projections by digital computer (Monograph 5015, Bell Telephone System)
6. Computer generated 3-d movies (Monograph 5077, Bell Telephone System)
7. Computer animation and the fourth dimension (AFIPS, Conference Proceedings, vol. 33, Thompson Book Company)
8. Computer graphics in acoustics research (IEEE Transactions, vol. AU-16, no. 2, June 1968)
9. Choreography & computers (Dance Magazine, Jan. 1967)

1. In 1, 2 and 3, Michael Noll describes an experiment on reaction to computer and non-computer art. He generated a picture resembling Mondrian's 'Composition with lines'. The two pictures were rather like variants on a negative of the night Manhattan skyline. Mondrian's was ordered; Noll's was more random. 72% of people couldn't distinguish the computer picture. 59% of people preferred the computer picture.

Mr. Noll is vehement in his defence of Mondrian as artist. (Although I suspect he was pleased the survey turned out the way it did.)

In 3 he says, 'Therefore, the results of this experiment neither discredit Mondrian nor imply that the computer is a greater artist than Mondrian, but raise the question to what extent randomness has aesthetical and emotional appeal.'

Some further experiments (described in 3), using the techniques referred to in 5 and 6, compared computer generated 3- and 2-dimensional pictures. Most people found 3-d pictures with random disconnected lines more agreeable than more ordered 3- and 2-d connected pictures.

People, especially young people, seemed to prefer disorder.

Disorder, along with substantial support from Physics, has, for many people, connotations of transience, independence, and freedom. We might say the disorder shows an aspect of the state of our psychology. We react to the picture with, 'I like it', or 'I don't'. The exclamations are superfluous; when a state is shown we simply know it. It would not be useful to ask how our psychology acquired these formal properties; nor meaningful to say it hasn't. We can imagine our psychology extending throughout the whole world. To say it is this or is not this we would have to find a vantage point outside the sphere of our psychology. It is meaningful only to look and to know.

2. What differences are there in computer and non-computer art, and which would one expect to be preferred?

2.1 Literature and art are representational.

They say things and they show things. Not everything can be said (Tractatus Logico-Philosophicus). What art shows may not be at all obviously related to what it says. To explain what is shown, it would be necessary to show it by saying something else. It is in what is shown that the deepest effects seem to lie.

Literature and painting, whether they are realistic or abstract, can make direct comment. Antennae reach out from the symbols of sentence and picture to what inspired them in the world (and that includes the author's mind). You can't talk about these connections, because whenever you talk, new connections are introduced. The form of the sentence, the structure of the painting, reflect the logic of reality and the formal properties of the artist's psychology and experience. The sentence shows the psychology through its form. But you can't talk about the form of a language with a language that has the same form.

(The existence of language in any form indicates a formal property of our psychology. It is a feature shared by us all. The symbols we choose to juxtapose within a sentence, the sentences we choose to juxtapose within a paragraph, show something of the form of our individual psychologies: the form includes not just the relation between the words, but the words themselves, for any symbol is an example of a formal concept. The need to take a view from outside our language, we hope outside our psychology—but the hope is vain for there is no escaping the form of our psychology—may account for private languages, based on rhythmic breathing, etc.)

The words on the page, the paint on the canvas, are external properties (extensions) of a mental state. Looked at as facts, always there, they have no form, they are discrete and isolated. They don't say anything and they don't show anything. When you think through the sentence, think through, absorb, the conviction of the brush strokes, you take the isolated fact of existence off the paper, and, in giving it sense, you give it structure in the mind. You don't have to perceive the form; having thought the sentence, you know the form. To the extent that this reflects the mental state (memories, etc.) of the author, you experience something of his mental state. It is in this transfer of states by showing that the artistic experience seems to reside.

(Mr. Noll, in 2, suggests computers will enable a physical transfer of states—as distinct from apprehension by absorbing forms. He says: 'The artist's particular interactions with the computer might be recorded and played back by the public on their own computers.... In this way, and for the first time, the artist would be able to specify and control with certainty the emotional state of each individual participant.... All this would be possible because the computer could monitor the participant's emotional state and change it according to the artist's specifications.')

It is possible for one medium to suggest something apparently of another medium—for example, music a picture—because each is an extension of a mental state, and shows that state through formal properties. Composing, painting, writing are not alone. Mathematics is a similar extension.

2.2 A proof can excite. It makes statements, of course, but in its form and pattern, it shows things about man's history. A proof, a piece of mathematics, can have aesthetic appeal. What do we mean?

Aesthetic appreciation is immediate. Wittgenstein says it is directed towards things, rather than caused by them. One knows straight away that one likes the object in question. The knowledge is awareness of a sensation one did not have before. Perhaps, in judging the best shape for a window, comparison is made with a paradigm drawn in our stature. Pleasure in a proof may use a paradigm of clarity drawn in our minds. One can think of aspects that might contribute to the fascination: for example, the arrangement of the symbols on the paper; the shock a proof may give—perhaps we had believed for years in something we now find, in one reading, is impossible; the mysterious nature of inference—a kind of insight thinking; the ghostly movement—a series of pictures with an implied operation for transforming one into another; the pleasure of submission to a path, at once inevitable and surprising. But, over everything, there is the pattern, crystallizing the proof, lending it reproducibility, showing, in its form, formal properties of mind, offering us, for a while, what we would like to grasp always. It is as if our psychology had got a glimpse of its most elemental lines. It can be aware of itself, in self-identity, but it can't depict its whole self within itself. Glimpses through the

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own extensions are all that are possible.
roof will guide us to a proposition. It may suggest a procedure or

der $y^2 = 4ax$. It has external properties--a plot--and internal properties--
aic cohesion, others whose mystery increases with thought. (A plot is
otation for an equation: it is more peculiar than writing as a notation
for example.)
form of the mathematics leading to a proposition there has been dis-
ychology of its creator, and, shown in others' acceptance, something
tural history. The more popular proofs are part of our common

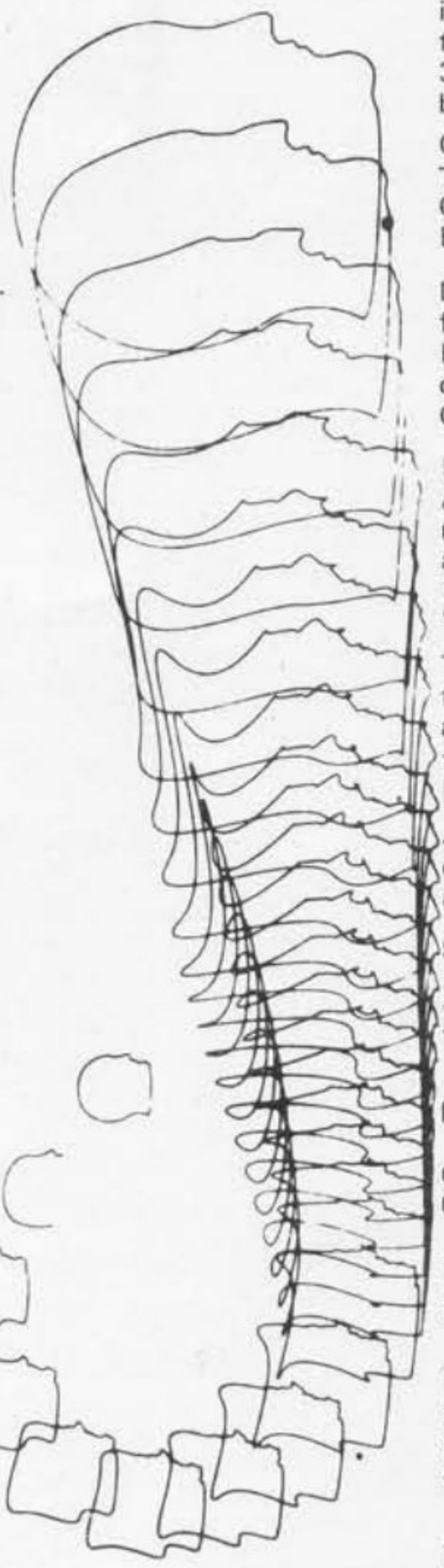
one now chooses to say something with these extensional properties
s, arranging them in a form reflecting his experience, etc. The appeal
ected to vary, depending on how the artist came upon the curves. If he
or invented them in his observation of nature, or even found them in a
by chance, through spontaneous attraction, his use of them is as direct
l as his use of speech. The programmer will improvise some mathema-
rate the curves. He may draw on classical procedures (particularly for
ok curves), and certainly something of his psychology and experience
wn in the form of even the crudest improvisations. This is irrelevant
urves came first. Their form was the artist's psychology. If he used
s to arrange them, because he liked the mathematics, that would be
Not thinking, somewhere, through mathematics deprives the artist of
machine's power.)
the artist discovers the curves through mathematics, if he is first
a proof, using them is like constructing a poem from a series of sen-
en by different people at different times, showing different states of
ion, experience, is already there. The curves that extend the mathema-
perties of that experience. In that the mathematics is part of our history,
s are likely to be popular, especially when the overall form is provided
through another piece of mathematics. Painting pictures through mathe-
e composing music by speaking poetry. It is different from just painting

se of a computer to generate the curves is incidental. The painting still
nature of the experience shown is affected by the route to the curves,

ar arguments apply to using mathematics (see 2, 3, 9) in choreography
posing music.

cussing the result of the survey, Mr. Noll says: 'The randomness intro-
he computer was in the form of a mathematical algorithm for computing
of uncorrelated numbers. . . The writing of the computer program was
objective manner incorporating appropriate mathematical formulas. All
es that no attempt was made to communicate any emotions on the part
rammer to the final computer pattern. Therefore the experiment com-
esults of an intellectual non-emotional endeavor involving a computer
ttern produced by a painter whose work has been characterized as
he emotions and mysticism of its author. The results of this experiment
to raise some doubts about the importance of the artist's milieu and
behaviour in communicating through the art object.'
ase the programmer was almost certainly attracted to the mathematics
om number procedures and, possibly, to some theorems in number
had looked at Mondrian first, but then he painted through mathematics.
nk of art as showing by saying, we can define 'showing' in such a way
puter can never be an autonomous creator. Increasingly it may appear
e can hold to our definition, and with some justification. We are happy
the computer as 'just a tool.' But we often then think of it as less than a
denly seems that what goes through a computer must come out cold.
so. A computer is as transparent to psychology, experience and emotion
ols. Often, indeed, composing through an intermediate language, emotic
though we had not willed it.

ing.



the question of random number generators as a principle element of compute
considerable treatment twice; by Benthall in his discussion of the Zagreb Sym
by G.L. Mallen in his discussion of the CAS Meeting on "Patterns of Random-
e that this question has to be placed in its proper perspective. There are three
is:

om number generators were not developed solely to be used to generate computer
e developed to aid in the solution of Real World Physical Problems (originally by
erlo Process) and as such clearly are of value to our specific art form to model
teristics of the real world that are of their very nature random.

ming one had a non-trivial computer program, i.e., one that is not developed to
ply a single preconceived item, one must make the choice as to which pictures
oduct) will be generated. If the program can generate a large number of pictures
machine to generate a single picture an input parameter must be designated that
he choice. Since the picture corresponding to any particular choice of input
as not been seen by the programmer, his choice is random, even if his choice is
ordinal numbers. As a consequence, a random number generator is intrinsic
rial pattern generators. That is to say, using Mallen's terms, the sequence gen-
serves to select a particular example of the art defined by some process. The
ription is the real embodiment of the art we see in the example. The specific
recognition of that process as revealed by the organization of the pattern

y, we must not expect that a limited machine can be used to simulate the com-
m of real world processes that occasionally baffle far superior data processing
mely, the brain of man). Until much more powerful machines are available,
x processes that are at work in the brain of the artist can not be accurately
merely supplanted by a random number generator together with some appro-
s. This is a substantial handicap. But the computer has its advantages not only
n its enormous "orderliness" that makes possible attending to details with
patience and precision.

's circumlocution results from not analysing the question. But perhaps Benthall's
nd justification in the fact that most computer art programs today are long on
bers and short on Process.

Walker
w Drive
ce, Maryland

BLOOD AMONG THE CYBORG-MEN

Conflict resolution techniques were blatantly in abeyance during the General Meeting held to discuss the future of the Cybernetic organisations, in the International Congress of Cybernetics, London, September, 1969. Seldom was a power struggle turned into a public spectacle of such savagery. A review of the Congress appears in Studio International, London, October 1969.

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ONE MORE AMERICAN COMMUNICATOR

Concluding an article in PesiCo Magazine (No 1, Volume 1, New York 1969) on the Expo 70 Pepsi Pavillion, which is a Pepsi-EAT collaboration, is this statement by one of the participating artists, Forrest (Frosty) Myers: 'This is a true work of art. A visitor going through the Pepsi-Cola Pavillion will not only have a good time, but he'll have a full artistic experience as well'.

YOU ARE INVITED . . . .

Computer Graphics 70 will take place at Brunel University, Uxbridge, Middlesex, England, 14-17 April 1970. Several million pounds worth of computers and graphics equipment will be on show. There will be sessions on Computer Generated Animation and Computer Art. The Computer Arts Society is organising a display within the exhibition, and contributions are invited. Please write to Alan Sutcliffe before 31 December 1969 describing the work to be submitted. If it is selected you will be asked to provide a short note by 31 January 1970.

Call for work/information in graphics/sculpture/animation Make contact with Mike Thompson who is reading a paper at Computer Graphics 70. 102 High Street, Codicote, Herts, England. Telephone in daytime: Welwyn Garden City 25111 Ext. 137.

Dr. Herbert Franke who has written and lectured on computer art and related fields for some years is preparing a book on computer art for a German publisher. He aims to produce a comprehensive survey. Artists are advised to send information on their work. Dr. Herbert W. Franke, 8024 Kreuzpullach, Post Deisenhofen, Germany. Phone 0811/6131947.

IBM Nederland will hold a symposium for system engineers in the Congress Halls, Amsterdam, 14-17 April 1970. About 1200 participants from all European countries are expected to attend. The organisers are looking for examples of computer art for the congress exhibition. J Schoonenberg, IBM Nederland NV, Hengelolaan 179, Postbus 8616, Den Haag. Phone 070 924121. Understandably, there is a 'seizable budget' (sic), and artists will at least receive transport and living costs.

The first international Electric Arts Festival (oops) is due to take place in Washington in the spring of 1971. Artists from all over the world will be invited to participate: a section on computer art will be arranged. The organisers would like to hear from artists in this field. Charles B. Yulish, Director E A F 229 Seventh Avenue, New York, NY 10011. Phone (212) 255 5355.

John Tranter, 350 Lyons Road, Five Dock, NSW 2046, Australia, is editing an issue of Poetry Australia which is due to appear early next year, and is collecting information on the use of computers in poetry.

Society member T. Wyatt plans to present an evening on computer art in January 1970 at the University of East Anglia. Members are asked to send him slides, tapes, film or any other material, with details of production. Material will be returned. T. Wyatt, St. Michael's Cottage, Rushmere, Lowestoft, Suffolk.

PUBLICATIONS RECEIVED

Collected Writings by A. Michael Noll. Bell Telephone Inc., Murray Hill, N.J. 07971, USA. Reviewed in this issue.

Konstruktive Kunst: Elemente und Prinzipien. 1969. Catalogue issued by Nurnberg Kunsthalle. Includes 2-page essay by Georg Nees. It ends memorably: 'The marble of the future is in the computer.'

1. Catalogue of the first exhibition of the centro de estudios de arte y comunicacion. August-September 1969. Illustrated
2. Del Pop Art al Arte Cybernetica by Jorge Glusberg: duplicated, 25 pages.
3. Reproductions of material on the theory and practice of computer art. All obtainable from ceac, elpidio gonzalez 4070, Buenos Aires, Argentine.

Time Sharing. The New Computer Revolution by R.D. Parslow. Duplicated, 7 pages. From Bob Parslow, Computer Science Department, Brunel University, Uxbridge, Middlesex.

Componerende Computers, by B.C. Sliggers, subtitled A Creativity Problem, 4th edition, 58 pages, is available from Bull General Electric (Nederland) NV, Vliegtuigstraat 26, Amsterdam-W. Holland. Phone 020/15 89 55.

Newsletters and microfiches as aids to international and interdisciplinary exchange of information on computer research in the humanities, by Johannes van der Wolk, 1969, 6 pages, duplicated. Includes the addresses of 12 newsletters. From the author, Otterstraat 51, Utrecht, Holland.

REAL TIME No 2. Large folded sheet. The intellectual's antidote to PAGE. Subscriptions 9s for 6 issues includes postage. From the Editor, Mike Reid, 66 Hargrave Park, London, N.19. Phone 01-272 0093.

Educating the Animator by Alan Kitching, 1969, 9 pages, illustrated. Available from Film Education Network, 16 Hillsleigh Road, Campden Hill, London, W8.

Richmond Arts Workshop would like members of the Society to contribute to their Arts Festival (second week in December). Members wishing to take part should contact John Lansdown immediately. You are also invited to attend meetings of the Workshop at Eel Pie Island Hotel, Twickenham, every Tuesday and Thursday evenings.

If you are working on projects, or have ideas for talks, discussions or activities John Lansdown would like you to let him know. According to John, work in progress can be just as interesting as completed items.

SWANSEA AND BRADFORD

The CAS list of contributions is now complete. John Wood's computer drama 'King of the Shouting House' will be the centre piece of CAS efforts and promises to be an exciting live production.

computer arts society meetings.

british computer society 23 dorset square london nw1
thursdays at 6.30 pm
13 november : art and behavioural science : george mallen
11 december : computers for music : alan sutcliffe

meetings are open to members and guests. no charge.
the bcs is moving its headquarters to 29 portland place w.1
please ring bcs early in december to check if the move
will take place before the 11th dec.

future events

10-15 november 1969.
systems '69, munich.
international
symposium on the
future. with
exhibition of new
technology.
professor karl
steinbruch
technischen
universitat
karlsruhen germany.

17-20 march 1970.
4th cranfield fluidics
conference and
exhibition, coventry.
h.stephens, secretary,
fluidics conference,
british hydromechanics
research association,
cranfield, bedford.

28 november 1969-
15 february 1970.
play orbit.
exhibition of toys,
games, made specially
for this show
plus a display on
the history of toys
and music
specially composed
for children.
exhibition arranged
by jasia reichardt.
ica nash house
london wc1.

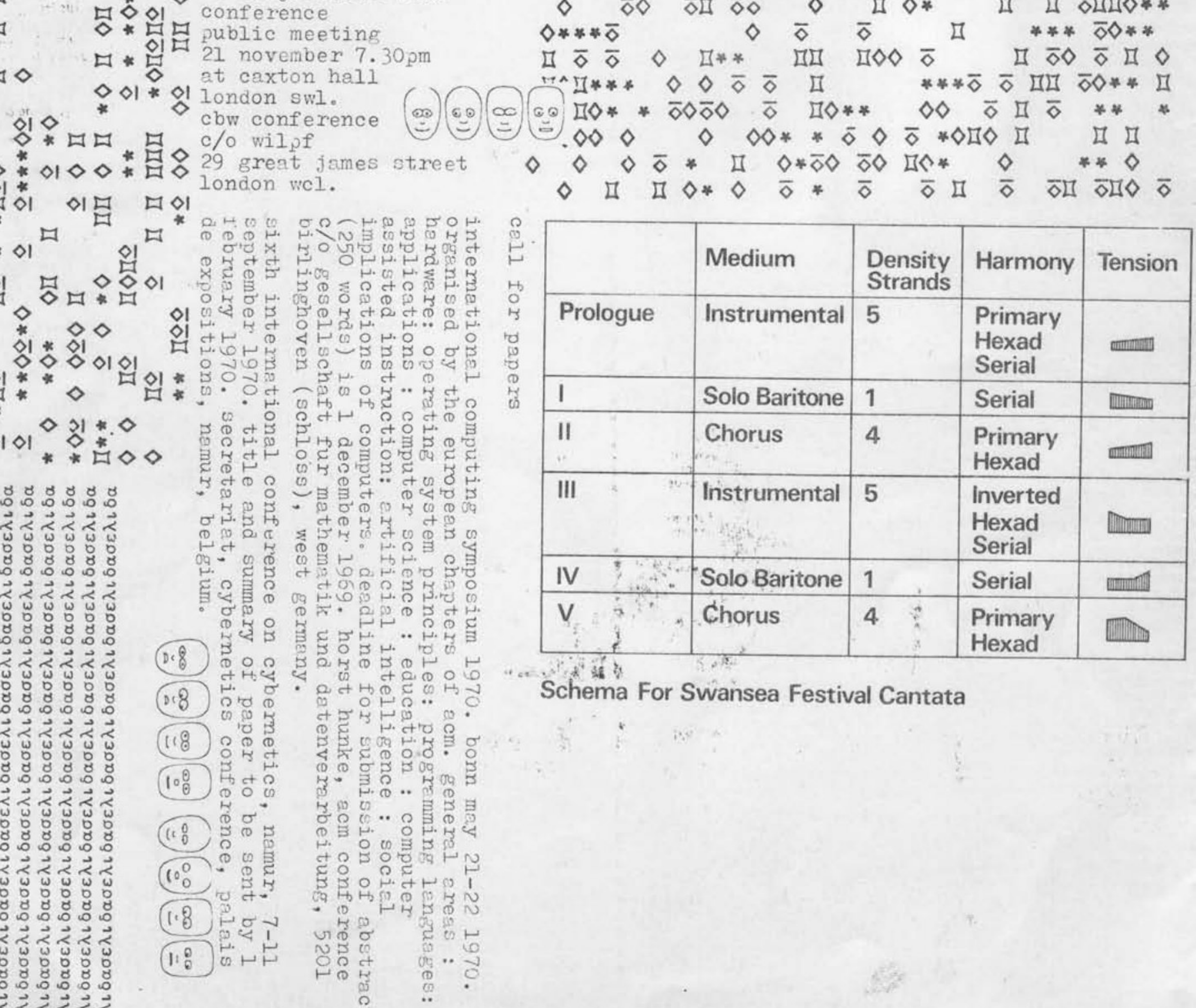
11-12 december 1969.
conference on holography
and the computer.
sponsors: ibm and
the optical society
of america.
a. jordan, jr. ibm
houston scientific centre
6900 fannin street
houston, texas,
77025, usa.

13 november 1969,
macnaghten concerts.
films with
electronic scores
and live electronic
works. town hall
euston road
london nw1 7.30pm.

29-30 november 1969.
second weekend course
and workshop
in non-numerical
programming.
time sharing limited
187 great portland st
london w1.
computer arts society.

21-23 november 1969.
international conference
on chemical and
biological warfare.
in conjunction with
conference
public meeting
21 november 7.30pm
at caxton hall
london sw1.
cbw conference
c/o wilpf
29 great james street
london wc1.

5-9 april 1970.
4th kybernetik-kongress
berlin 1970.
elektrotechnischen verein,
berlin im vde,
1 berlin, 12,
bismarkstrasse 33
germany.



call for papers

international computing symposium 1970. bonn may 21-22 1970.
organised by the european chapters of acm. general areas :
hardware: operating system principles: programming languages:
applications : computer science : education : computer
assisted instruction: artificial intelligence : social
implications of computers. deadline for submission of abstract
(250 words) is 1 december 1969. horst hunke, acm conference
c/o gesellschaft fur mathematik und datenverarbeitung, 5201
birlinghoven (schloss), west germany.

sixth international conference on cybernetics, namur, 7-11
september 1970. title and summary of paper to be sent by 1
rebruary 1970. secretariat, cybernetics conference, palais
de expositions, namur, belgium.

	Medium	Density Strands	Harmony	Tension
Prologue	Instrumental	5	Primary Hexad Serial	
I	Solo Baritone	1	Serial	
II	Chorus	4	Primary Hexad	
III	Instrumental	5	Inverted Hexad Serial	
IV	Solo Baritone	1	Serial	
V	Chorus	4	Primary Hexad	

Schema For Swansea Festival Cantata