COMPUTER EDUCATION

THREE SHILLINGS

MARCH 1966

No. 00001

SET GRADE = 0

HAVE YOU HEARD OF COMPUTERS?

YES → Add 1 to GRADE

NO → CONSULT A DICTIONARY

ARE COMPUTERS IMPORTANT

YES → Add 1 to GRADE

NO

SHOULD EVERYONE KNOW ABOUT COMPUTERS?

YES → Add 1 to GRADE

NO → THINK AGAIN

ARE YOU A MEMBER OF G.E.G.?

YES → Add 100 to GRADE

NO → JOIN NOW

IS GRADE > 0

YES → YOU SHOULD HAVE AN ARTICLE FOR THE JOURNAL

NO → YOU SHOULD HAVE A QUESTION FOR THE JOURNAL

START WRITING

Subscriptions should be made out to "The Computer Education Group (B.C.S.)" and sent to D. E. Conway (Sec.), Staffordshire College of Technology, Beaconside, Stafford.
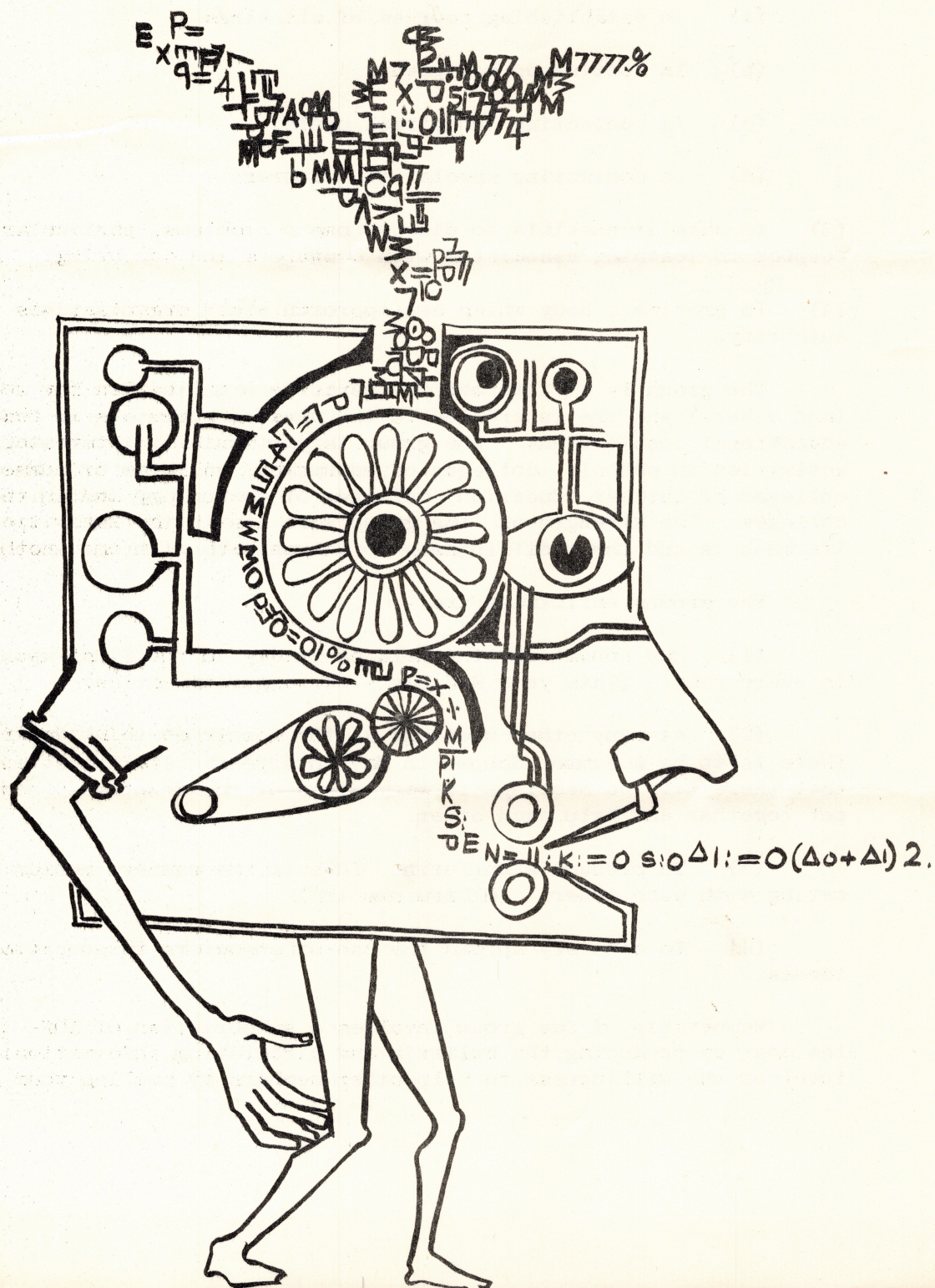
There is a school membership which is £1 and this entitles the school to 4 copies of the bulletin (and other literature) and to 2 votes at the A.G.M.

AIMS OF THE GROUP

(1)   To spread knowledge in the field of computing in education

(2)   To give aid to one another concerning problems :-

      (a)   In establishing courses of all kinds,

      (b)   In setting up equipment,

      (c)   In contacting industrial users,

      (d)   In contacting specialist lecturers.

(3)   To make it possible to discuss one's problems, particularly with respect to teaching associated with computers and computing.

(4)   To provide a body which can approach other organisations with authority.

The group is an informal co-operative organisation for teachers (and others) who are interested in the uses of computers in teaching in educational institutions The group is particularly interested in the activities in schools, colleges of education, colleges of commerce, colleges of further education, colleges of technology and in technical colleges The strength of the group will lie in the activities of all its members and their willingness to communicate with one another.

The groups activities are.-

(1)   One annual meeting held on Friday in the first week of May in every year (This year 6th May - see separate notice)

(2)   As many other meetings as the Committee think desirable. There is to be a Summer School in May this year. It is also envisaged that there will be meetings in many areas of the country so members can get together and help each other.

(3)   To produce a bulletin. This is the members medium of communicating with each other (Please use it.)

(4)   To actively spread the use of computers in education at all levels.

Membership of the group involves a subscription of 10/- to cover the cost of producing the bulletin and circulating information. It also involves the willingness to help other members by pooling your experiences.

AIMS OF THE BULLETIN

This publication is for the service of YOU, The READERS. The more material YOU provide the more successful it will be. Any ideas for series of articles will be welcome. Any contribution, big or small, should be sent to the editor at the Staffordshire College of Technology, Beaconside, Stafford. It is intended that we should use the bulletin to help all our members. To this end we are going to set up a problem section which will function in two ways. Enquiries should be sent to the editor who will try and find some authority to provide the answers. Unless otherwise requested, the problem and answer will appear in the bulletin. If the enquiry is for general information then it will be published with a request for help from our readers.

We also intend to include in the bulletin references to books and articles of interest and, if submitted, reviews of the same.

There will be similarly, lists of equipment in use and descriptions of success or otherwise. Difficulties and snags encountered in use of equipment would also be welcome so that readers do not have to suffer and can benefit by other experience.

We also want to provide information relevant to examinations and courses being provided in the field of computing.

To the same end we are going to give problems which we want to get members and their students to submit answers. The best answers will be published in the bulletin. All contributions for the bulletin should include the writer's name, address and afficiation. They can be hand written and in any form convenient for transit to the editor.

ANNUAL GENERAL MEETING

This is to be held on Friday, 6th May, 1966, at the Staffordshire College of Technology, Beaconside, Stafford. There has been arranged a visit to the neighbouring N.C.B. computing centre for the morning. There is a limited number of places available for the visit so I will be very pleased to hear as soon as possible from anyone who wishes to attend. Lunch can be provided in the college refectory from 12.00 a.m. - 1.30 p.m. Again it is necessary to book all the meal places required, so early notification would be appreciated. The business section of the meeting will be held from 1.30 p.m. to 2.30 p.m. This will be followed at 3.00 p.m. by some talks and discussion of the work being done in schools. It is hoped to have computing equipment available for inspection during the entire day.

Would anyone intending to attend the A.G.M. please notify me immediately indicating whether they want to go on the N.C.B. visit and if they want lunch.
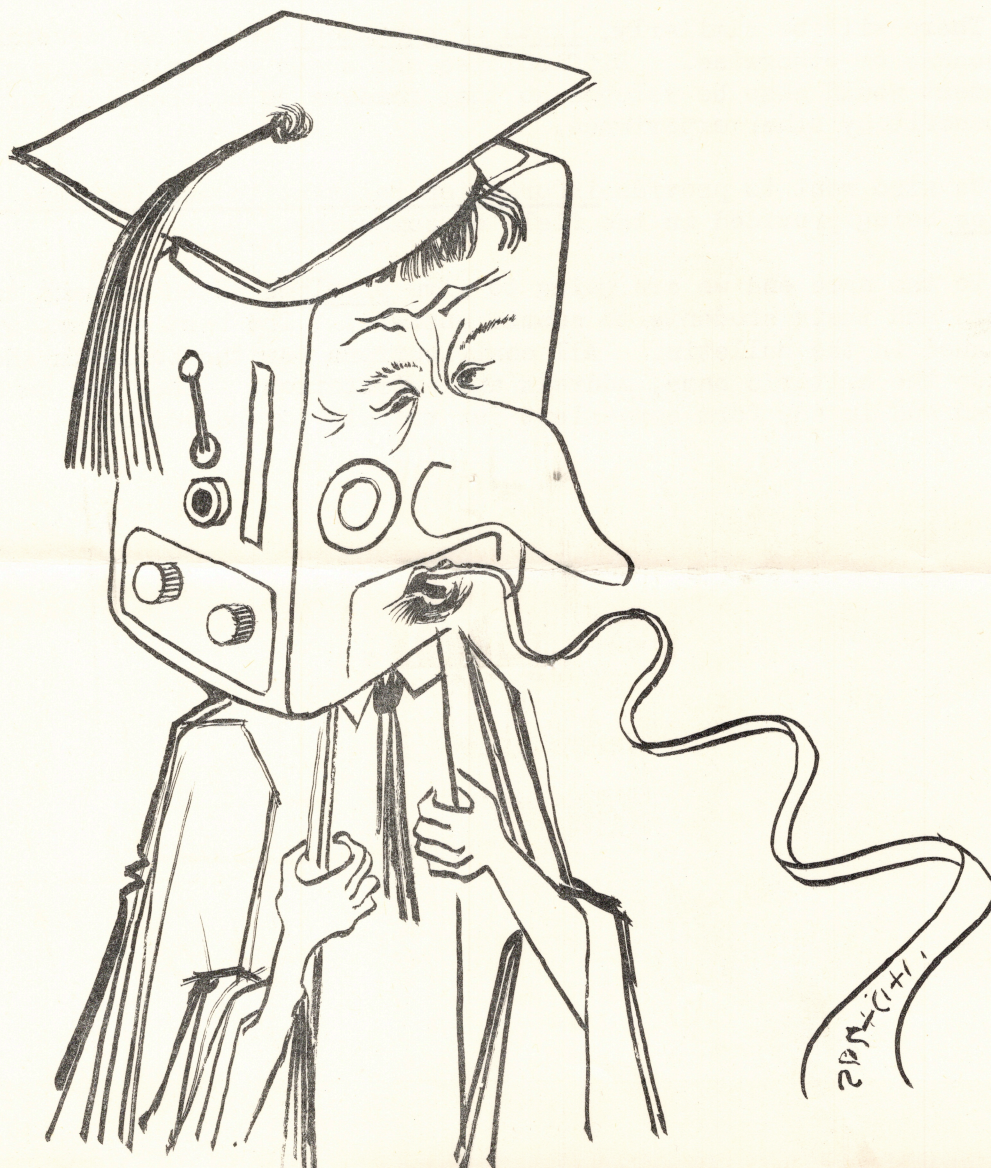
SUMMER SCHOOL

It is intended to hold a Summer School on Computing in Education for headmasters, headmistresses, careers' masters and mistresses. The final arrangements are not yet complete but the proposed venue is Birmingham and the date will probably be in the last week of May.

We would be pleased to hear from anyone interested in either attending or contributing. In the case of the latter we are interested in displays of equipment, descriptions of work being done in schools and work done in further education.

We are in the process of circularising L.E.A.'s and the teacher's unions. If anyone knows of interested persons we would be pleased to have their names and addresses.
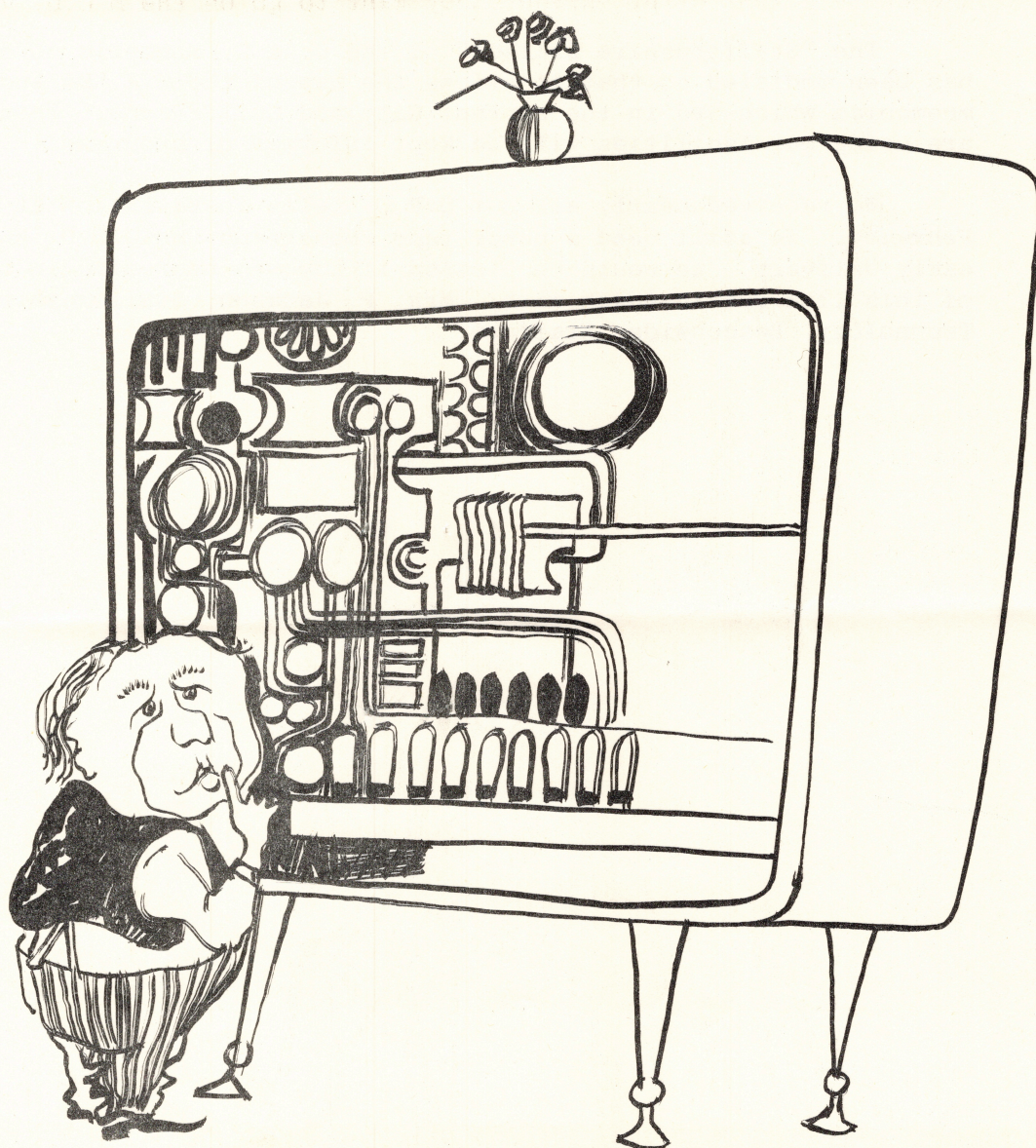
STAFFORDSHIRE COLLEGE OF TECHNOLOGY - SERVICE TO OTHER INSTITUTIONS

In bulletin O there was:-

Progress with Telex and Postal links at Staffordshire College of Technology

A.G.P.O. Telex installation is now on order and when this arrives we shall start immediately with our tests to determine how such a link can be used most efficiently.

At present we are offering to run programmes for other institutions on a trial basis. We are prepared to accept Alphacode or C. & G. Mnemonic (Staffordshire dialect) programmes in any code on 5-hole tape and any code on a specified field on 80 column cards. The system we are using is to have translators which convert these programmes into tapes which are accept- able to our existing compilers.

The "Staffordshire Dialect" of the C. & G. Mnemonic code (course 319) has been modified so that it allows the use of the STA LDA and input-output mnemonics which are in the current City and Guilds code. Those people who are using our facilities will be kept informed of progress.

We received nearly all our G.P.O. Telex installation at the end of February. We still need a paper tape reader and the G.P.O. have promised early delivery. We would be pleased if anyone interested in making use of this link get in touch with: Mrs. P. Jackson, Staffordshire College of Technology, Beaconside, Stafford.

REPEAT OF REPORT IN BULLETIN O

B.C.S. Education Meeting held at Northampton College

15th October, 1965

The Programme was :-

Computer Training for Industry

"The Agony of it all"   Experience of Installations

       Mr. J. Wren Lewis - I.C.I. Ltd.
       Mr. A. R. Steel   - National and Grindlays Bank.

"Job Specification and the General Organisation for a Computer Unit"

       Mr. E. L. Willey - Prudential Assurance Company
       Mr. Leo Verre   - Culham Laboratory.

"D-I-Y Training"

       Mrs. M. M. Barrett - A.C.A.E.E. Boscombe Down
       Mr. J. W. Mills   - Royal Insurance Company.

Education for Computer Careers

       What is happening in the Schools - Miss Diana Law - I.C.T. Ltd.

       What is happening in the Colleges of Technology and Technical Colleges -
          Mr. J. A. P. Hall, Hatfield College of Technology.

       What is happening in the Universities - Mr. I. M. Khabaza,
          Queen Mary College, London.

       Progressive Education and Training Schemes - Mr M. H. Taylor,
          City and Guilds of London Institute and Miss D. Law, I.C.T. Ltd.

       The Work of the Society's Education Committee - Mr. M. Bridger,
          Leicester College of Technology.

Report on Meeting

    In the first section there was a series of short talks about the
experiences of users in industrial installations which brought to the
meeting's notice all the usual hazards and difficulties involved in
training personnel. The second section dealt with what is being done
and the speakers gave statistics where possible. It was continually
stressed that there was no efficient channel for communicating informaion
about courses. The Education Committee is endeavouring to establish a
clearing house for such information. It was also clear from various
remarks during the second session that computer users and manufacturers

do not present a united front when considering training and education.
It is thus apparent that a great effort must be made to establish
recognised training and educational procedures.

　　　　We would be pleased to receive reports of other meetings of this
kind. Please send them to the editor.
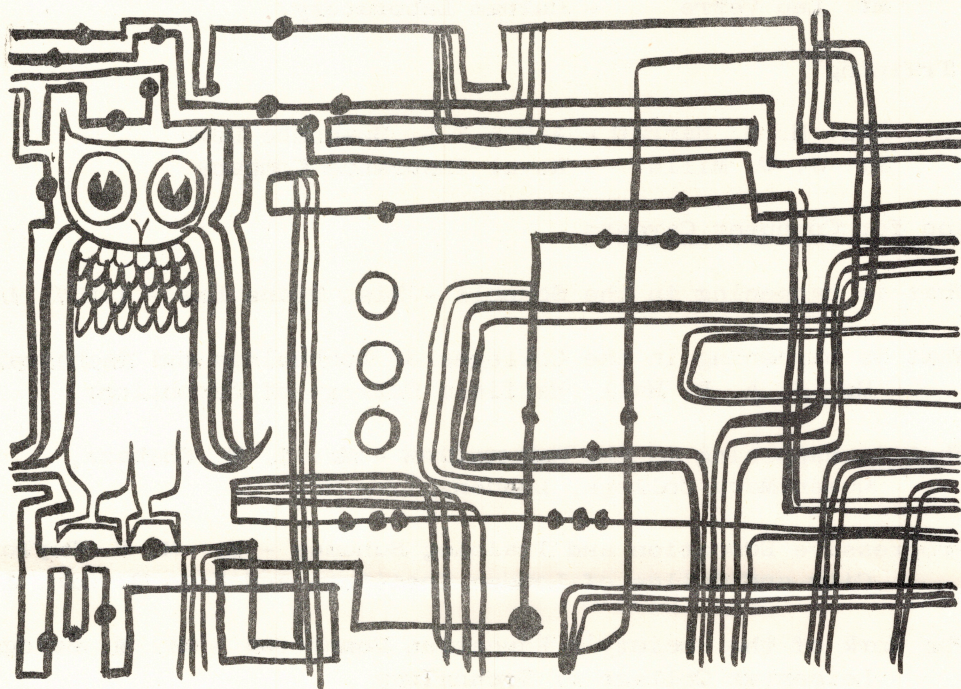
WORK IN SCHOOLS WITH COMPUTERS

An article in the "Mathematical Gazette" published by the Mathematical Association recently gave details of courses for VIth Formers which were laid on at Technical Colleges. Many Colleges offer similar courses, although it is clear they are not all organised in the same way. We now run courses for VIth Formers in the Summer term, each of which lasts for two days. During this time the students prepare and run their own programmes. We endeavour to give them as much practical contact with the machine as possible as this is what they cannot get at school. The courses seem to be very successful, even though they tire the college staff. We would recommend that these courses are provided at all colleges. They provided good experience for the College staff and the children see what a technical college looks like. At VIth form level, I have incorporated some work on ALGOL programming into an experimental A-level course for Further Mathematics which is supported by the N.U.J.M.B. This also seems to be very successful.

This term we have started to see how useful computing can be at an earlier age. We have so far had a visit from a third form in a local comprehensive school. They were at the College for an afternoon and learnt to write simple programmes. These programmes the children, boys and girls, then prepared and ran themselves on the DEUCE computer. We hope to follow up this visit with some more work at the school.

I think that at school level, the interest value of computers is worth exploiting where and whenever possible. We at this College are willing to help anyone who wants to do this.

To conclude, I should like to comment that I am not so sure that schools should have computers, but I am convinced they should have easy access to BIG computers. You do not need to justify the use of computers in terms of specific mathematical ideas which can be developed, for the interest in mathematics which is generated is more than adequate reason for their use.

D. E. Conway

Staffordshire College of Technology.

COMPUTER INSTALLATIONS IN SCHOOLS

We hope to give details of the installations of computers in schools. Some information has come to our notice already and this is given below and in one of the articles in the Bulletin ("Leicester Schools Report"). We would like to hear from others with installations e.g. South Shields education authority have acquired some facility according to reports on the B.B.C. - could we have some information as to the costs and proposed use?

Forrest Boys' Grammar School, Berkshire

Nestlé Co. Ltd. have given an Elliott 405. This supplements the building of computers which the school has been involved in. They intend to use the computer for statistical work in 6th form subjects like Geography, Economics and Biology. Estimated costs are:-

Spares, Alternator & transport	£770
Ventilation & sound proofing	£150
Electrical work	£300
*Provision of a room	£1,200
Running cost for 12 hrs. per week	£300 per annum
Replacement of parts	£80 per annum

* The computer is housed in the main building but this means a Terrapin mobile classroom unit has been provided to replace the absorbed classrooms.

REPORT OF WORK IN LEICESTERSHIRE   -   D. I. Stubbings

In 1961/2, the College School at Loughborough found certain limited but regular computer facilities available at a nearby computer centre that was in the process of development. Three or four outstanding second year sixth formers made use of these on a fairly independent basis. One of these has since been very active in the Cambridge group. It was immediately apparent, that some organised attempt at developing computer proficiency in the sixth form was worth while, but a start was delayed by hospitalisation of the prospective organiser. In 1963/64 the project was under way. An evening course extra to the Advanced Level course was running with upward of a dozen lower sixth formers attending. No attempt was made to select them or coerce them. Any wanting to come did so, any wishing to stop did so. In the second year students wishing to carry on worked on a tutorial basis. This means that over the last three years experience has been gained of the ability and reaction of various types and standard of student.

As a result to date, about sixty students have left school with an elementary knowledge at least of the uses of a computer and its programming, the spectrum ranging all the way up to those who upon leaving were capable of quite sophisticated Fortran programming and who were avidly reading up new languages. Calling the general case B, and those who have used their second year to become proficient A, (many who could have become proficient decided to concentrate on examination work only in their second year) the table looks rather like this:

	A	B	It is expected to develop	A	B
61/62	2	2			
62/63		14			
63/64	1	11			
64/65	2	17			
65/66	1	9			
			66/67	9	15
			67/68	15	20
				15	20
				.....	

This year note that although there are a smaller number under B (lower sixth form work) it is expected that they will all develop. This is partly because of the availability of increased facilities to be described shortly, and partly because the course now knows where it is going and the tutor how to develop the students. It and he are out of the prototype stage. The school is now beginning to look at the problem of building its own computer.

A one-day conference for sixth formers in the County at large was held about a year ago and fifty applicants were accepted. These applicants all received holiday literature in the form of a short manual based on the course experience at College School. The aim was to

teach programming through the medium of programmes, rather than simply to
define the logic of a particular language in every nicety. In a tutorial
session at the commencement of the conference it was found that most
students had grasped almost the entire content of the pre-conference
manual, and as a result a great deal was achieved in the rest of the day.
Several programmes from students were found to be faultless and were
immediately printed and run. The level of student ability was high, ad-
mittedly, but this experience confirmed fully what we had begun to suspect,
that there were immense student possibilities. Several students and staff
made it clear that they were anxiuous to have facilities as soon as may be.

When during the preparation of another conference on another topic
entirely it was discovered that the co-operating firm was about to dispose
of a Mk III Deuce to make room for the delivery of a KDF 9, immediate
steps were taken. At the conclusion of the conference being prepared, all
work was directed to liaison between the County authority and the firm
involved. Many snags were encountered, and even now all of these are not
wholly ironed out, but after many alarums and excursions, Leicestershire
have become the proud possessors of their own computer. It is intended
eventually to have time bookable by any County school. Before that day
arrives however there is much still to be done. Prior to delivery, when
it was realised that money lack (financial stringencies is the accepted
phrase) would mean that we could not yet maintain a compiler, there was
very anxious work by the present writer on the intricacies and charms of
Deuce Machine Code. Weekly visits were paid to the computer bureau con-
cerned. At one stage he was accompanied by enthusiastic supporters. These
all at one time or another decided to wait for the course that was envisaged
and which will be described below. The reader can imagine the tutor, an
engineer well versed in circuit theory and logic diagrams and Deuce, and
the student, who can comprehend binary well enough but has not previously
had time to look at any form of machine code except Tutac, and who knows
nothing about Deuce. Look, (finger racing through circuits) it's obvious
that ....
                But (finger plodding through binary fields) .....
and eventual retirement to the mecca of the modern Omar.

However, the stage was reached where the student was able to programme
Deuce in machine code, and only had the problem of how to teach it.

The computer was delivered last term (and was not dropped) but did
of necessity take a shaking. Although the firm spent considerable time
on ironing out the faults that developed as a result of standing and of
transit, we expect to be some months yet before the machine is in full
working order continually. It is housed at the College of Further
Education at Loughborough, who are contributing not only by giving the
machine house room, but in other ways as well, and with whom we look for-
ward to a long and happy computer future. Many simple programmes have
been written and run, but more ambitious work will have to await all bugs
being squashed.

Meanwhile, a course of lectures is being held and is attended by sixth form staff, College of Education staff, and surprising 'odd' members. It started with the introduction of programming principles based on the successful one-day conference manual (expanded in a hurry and unfortunately having some errors in the process) and going on from there to full study of a Deuce style six bit binary field, and the introduction of Deuce machine code. Based on the experience of these lectures the first manual will be polished, and a second written on Deuce machine code, and subsequently a series on various languages and aspects. Each harder manual will be put into one-one correspondence with the first manual across the intersection of the subject matter. Soon the members of the class (about forty strong) will be manipulating Deuce for themselves and will be submitting ideas for consideration on the development of the course for staff, and on the development of sixth form work based on staff experience. Some girls from a local school have attended with their staff member and seem to be enjoying themselves thoroughly, despite the pace.

CODED MESSAGES   1

     For younger students we are going to provide in each issue a question which will be in coded form. We want answers in coded form. We are going to start by using the simple coding matrix method.

     If Message is M, then coded message C is formed using E, coding matrix. C = ME. Using D, the decoding matrix, we recover the message by M = CD.

KEY

A - 8, B - 16, C - 15, D - 20, E - 3, F - 24, G - 22, H - 2, I - 6,

J - 27, K - 25, L - 21, M - 17, N - 4, O - 13, P - 18, Q - 29,

R - 10, S - 7, T - 9, U - 19, V - 26, W - 1, X - 28, Y - 23, Z - 30,

space - 5, . - 12, , - 14, ? - 11.

    Coded question:-

$$\begin{bmatrix} 1 & -1 \\ 5 & -7 \end{bmatrix} \quad \begin{bmatrix} 9 & -13 \\ 16 & -25 \end{bmatrix} \quad \begin{bmatrix} 1 & 1 \\ 12 & -17 \end{bmatrix} \quad \begin{bmatrix} -1 & 5 \\ 28 & -45 \end{bmatrix}$$

COMPETITION PROBLEMS   1
_____

    We ask readers or their students to submit solutions to the follow-
ing problems. The best solutions will be published.

(1)   We invite solutions to the problem of finding the roots of the
    equation:-

$$a x^2 + b x + c = 0$$

    These can be any "computer language" or in flow chart form.

(2)   We invite a solution to the problem of providing a programme which
    simulates the activity of automobiles at the controlled road inter-
    section illustrated below.

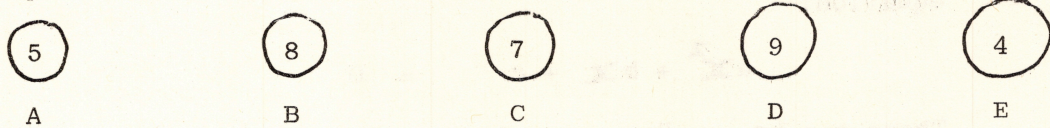"two way"   "two way"

one
way
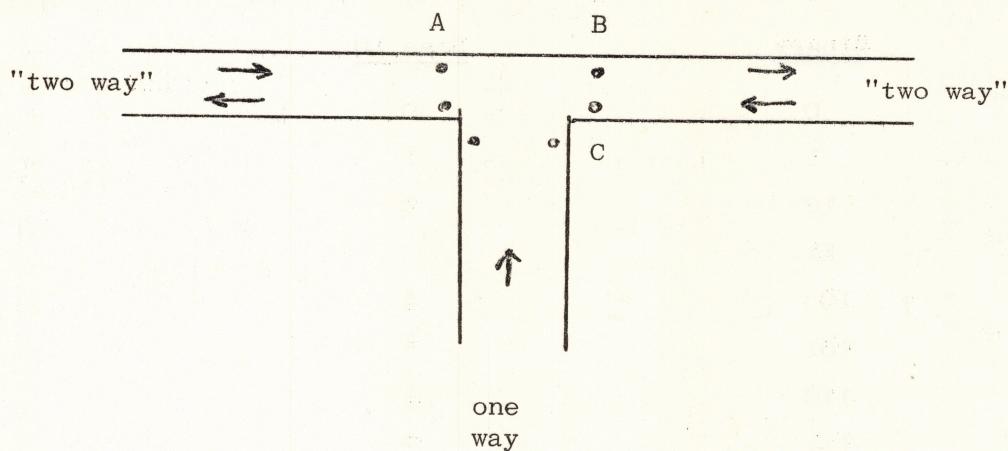
    Assume lights A control left road, B control right road and
C the central road. Solutions may be in any "computer language"
or in flow chart form.

BINARY BITS

Do you know that the game of "NIM" is an application of binary arithmetic?

The game starts with any number of piles of matches, with any number in each pile.

(5)	(8)	(7)	(9)	(4)
A	B	C	D	E

One side picks as many matches from one pile as they like and the object is to leave the last match for your opponent, each side 'taking' alternately.

Let us revise the binary system of counting.

Binary	Base 10
0	0
1	1
10	2
11	3
100	4
101	5
110	6
111	7
1000	8
1001	9 etc.

In the game.

5	101
8	1000
7	111
9	1001
4	100
	————
	2313

To win you must keep each digit
sum even.
Say you take one out of the
pile 'E'

Binary Position

101
1000
111
1001
11
————
2224

He takes all nine of pile 'D', leaving this;

```
  101
 1000
  111
   11
 ----
 1223
```

You can take seven of pile 'B'

```
  101
    1
  111
   11
 ----
  224
```

He takes the one in pile 'B'

```
  101
  111
   11
 ----
  223
```

You can take one out of any pile.

    Proceeding in this way you will win provided you do not leave at the end, two piles with only one match in each, e.g.

      3   1   (you take all of the '3' pile.)

    If you have any interesting binary ideas please send them and we will publish as space permits. Open to all ages!

TWO DAYS AT 30/-   PER HEAD?

B. F. H. Coleman, Director Digital Computing, Wolverhampton and
Staffordshire College of Technology.

One of the most useful objects of the C.E.G. is to pool experience
in the field of computer education. In this article I put forward a
number of ideas and problems that we have accumulated at Wolverhampton
in the last seven years.

Since 1959, the College has run a series of two-day introductory
course in computing. The courses have been mainly aimed at Teacher
Training Colleges and Sixth Forms. There is no doubt of the success of
these courses from the customer point of view. We now run 25-30 courses
a year, in all a total of some 450 students attending. We are already
making bookings for 1967. Groups come from as far as Worcester, Hereford,
Coventry, Cheshire, and even Sunderland.

The structure of the course is, I think, conventional. Introduc-
tory lectures on hardware and programming are illustrated with demon-
stration. This is followed by a practical period comprising roughly
one half of the course time when students write, punch and run their own
programmes. The last 2 hours are devoted to a final lecture and dis-
cussion.

The computer used normally in the course is the Dekatron computer
from Harwell which was installed in the College in 1957. Programming is
done in numeric machine code, the only system available for this machine.
Since the installation of an IBM 1620 system in July, 1964, this system
has been used in conjunction with the Harwell machine, programming being
carried out in a subset of Fortran II.

A small number of courses for serving teachers in the area has been
arranged in conjunction with the Local Education authorities.

There is no doubt that in some cases the course has had a lasting
impact and a small number of students have returned with groups from
schools, having given preliminary instruction and prepared programmes
to their class. After a short demonstration, programme punching and
running has proceeded immediately.

I have some misgivings about the efficiency of such courses which I
outline below.

Is two days sufficient? One remarkable thing about these courses
is the obvious enthusiasm of the participants at the time. Every one
says "We would like more". I wonder how long this interest lasts without
the contact with a computer. Does this experience become pigeon-holed
with "interest visits" to the Sewerage works, the Local Newspaper offices,
etc. Is computing relegated to the fourth division of "activities that
go on in every-day life, are more or less necessary, but you do not con-
cern yourself with them unless you play in that division". I may be

wrong about this. I hope the activities of this Committee will fill the
gap in knowledge that exists in this respect.

It does seem to me that a greater access to a computer is necessary
to maintain this initial enthusiasm and this can only be satisfied by more
computers.

There is a point here, which we would do well to recognise now. A
lot of this type of work has been centred on the Technical Colleges. As
these Colleges develop vocational courses in computer science, the time
available on their computers for this type of course will decrease rapidly.
If Technical Colleges are to continue this work, they will need large
installations with programme sharing facilities, or duplicate computers.

Is the Technical College the best place to do this work anyway?
Although our experence at Wolverhampton has been highly rewarding, it might
well be that our experence of educational theory at the school level is
not sufficient for use to emphasise the right points. Perhaps a computer
centre to serve a number of Training Colleges and Schools is a better
answer. Such an installation would offer much better facilities for
educational research and could be used for administrative purposes at
night or during the school vacations.

What type of computer is most effective?

Our experience covers use of a first generation valve computer and
a fairly fast solid state computer with a sophisticated software provision.
There seems to be no definite answer to my question.

The use of a single operation mathematical autocode such as Mercury
or Elliott autocode, Gotran seems to allow programming to start in the
minimum time. An extended autocode seems to present no more difficulties.
This type of system operating in a load-and-go mode allows a high through-
put of programmes.

We have found, however, that students get more satisfaction from a
system nearer to the machine language. The main difficulty arising from
programming on the Harwell computer has been the painfully slow processing
and consequent delay in programme execution. We have not tried to use
our assembler system on the 1620 on courses such as this, as the machine
is variable-word-length and has many procedural problems which would
obscure the basic concepts of programme organisation. I still feel that
a simplified symbolic assembler system might be the best starting point.

Which ever system is used, some type of display system, to demon-
strate in slow motion the computing process, would seem to be essential
if the computer is not to remain a 'black box' in most minds. The
combination of slow machine for demonstration and fast machine for pro-
cessing is a luxury not generally available. Our experience indicates
that initial demonstration on the Harwell computer at a speed comparable
to an electric calculating machine plays an important part in removing
the initial fears of the machine 'that thinks'.

We have concentrated on courses for Teacher Training Colleges because we feel that unless the teachers in schools have some knowledge and experience of Computers, progress in the expansion of Computer Education will be slow. The major proportion of students have been specialising in mathematics or science. There still seems to be a antipathy for computing in other disciplines. We may hope that the C.E.G. will be instrumental in breaking this antipathy down.

The fee for our course has been that in my title, 30/-d. per head. This is calculated on staffing the course as the running expenses of the Harwell Computer are small and no capital depreciation is involved. This is not an advertisement, we are unable to provide any more courses per year and can only accept bookings from our 'regular' customers. The cost of such courses with modern computers is going to be much greater but the cost must be found. Also, computer manufacturers please note, the computers must be found at the right price if this sort of work is to be extended.

Wolverhampton.

QA   From an A-level further mathematics paper.

Describe the calculation which is performed by the following ALGOL programme, and determine the number which will be   pointed as output.

Version one;

```
begin integer  K,  S;
        S:  =  0;
        for K:  =  0 step 1 until 10 do
        begin  S:  =  S + 2 ↑ K
        end;
        print S
end
```

Part of another programme for the same calculation appears below. Complete it using an "if .... then" statement instead of a "for" statement.
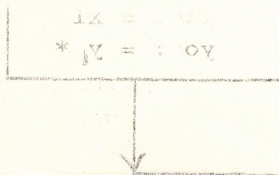
Version two;

```
begin integer  n, k, s;
        n:  =  11; k:  =  0;  s:  =  0;
again: s:  =
```
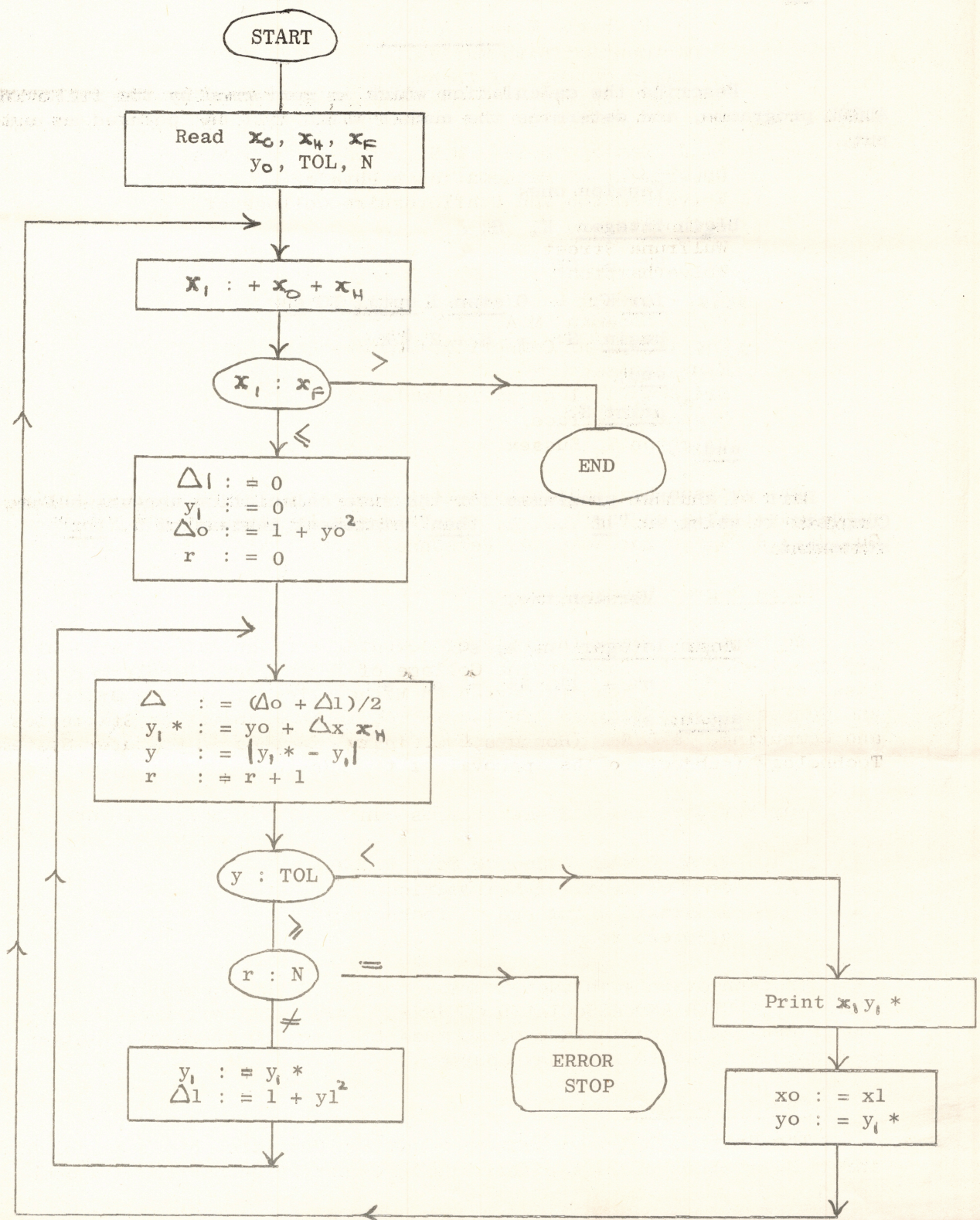
Q.B. From an engineering degree course paper

Write an "alphacode" programme for the process defined by the flow chart below.

START

Read x_0, x_H, x_F
y_0, TOL, N

$x_1 : + x_0 + x_H$

$x_1 : x_F$ $>$ END

$\leqslant$

$\Delta 1 : = 0$
$y_1 : = 0$
$\Delta o : = 1 + yo^2$
$r : = 0$

$\Delta : = (\Delta o + \Delta 1)/2$
$y_1 * : = yo + \Delta x \, x_H$
$y : = |y_1 * - y_1|$
$r : = r + 1$

$y : TOL$ $<$ Print $x_1 y_1 *$

$\geqslant$

$r : N$ $=$ ERROR STOP

$\neq$

$y_1 : = y_1 *$
$\Delta 1 : = 1 + y1^2$

$xo : = xl$
$yo : = y_1 *$

Details of these courses should be available from:

Dr. Jackson, Staffordshire College
of Technology.

J. A. P. Hall, M.Sc., A.R.C.S.,
Department of Mathematics,
Hatfield College of Technology,
Hatfield, Herts.

F. J. Hawley, B.Sc., M.Sc., F.S.S., F.I.M.A.,
Department of Mathematics & Physics,
Wolverhampton and Staffordshire College of
Technology,
Wulfruna Street,
Wolverhampton.

R. H. Goodman, M.A., B.Sc., A.M.B.I.M.,
Department of Computing, Cybernetics and
Managements,
Brighton College of Technology,
Richmond Terrace,
Brighton 7, Sussex.

Dr. Jackson has indicated that there are still three residential places available on the "Course for Teachers involved in the City and Guilds 319 Course for Computer Personnel Certificate".

More degree Courses

We have also been informed of computer residential courses which are provided at the Constantine College of Technology, Middlesborough. These are: a B.Sc. Honours Degree in Mathematics (including Statistics and Computing); a two-year full-time course in Mathematics Statistics and Computing; a B.Sc. (Honours & Ordinary) degrees in Computer System Technology (subject to the approval of the CNAA).

Further details of these courses can be obtained by writing to:-

W. A. Greig, B.Sc., M.Sc., F.I.M.A.,
Head of Dept. of Mathematics,
Constantine College of Technology,
Middlesborough.

In connection with such courses the B.C.S. have compiled a LIST OF COMPUTER AND ASSOCIATED COURSES. This will be a great use to educationalists. Our notice of courses is aimed to attract attention at specific times to relevant courses.

The B.C.S. List

The British Computer Society Education Committee has been collecting information about courses either wholly or partly connected with computers

COURSES OF INTEREST

We would like to hear from anyone who knows of a course which might be of interest to members of the group. Such courses range from one day, one week, or a week-end to full-time courses of a term, a year or several years.

In bulletin O we had the following:-

Course for Teachers involved in the City & Guilds
319 Course for Computer Personnel Certificate

A series of courses will be held again this year. Course A, the Basic Computer Programming course, will be held at Easter, 1966.

Monday, 4th April, 9.00 a.m. to Friday, 8th April, 5.00 p.m.
Tuesday, 12th April, 9.00 a.m. to Friday, 15th April, 5.00 p.m.

The cost will be £18. 18. 0d. which will include accommodation in the College hostel, all meals and tuition fees.

Will anyone interested please write as soon as possible to:

> Dr. H. L. W. Jackson,
> Head of Department of Mathematics, Science and
> Computing,
> Staffordshire College of Technology,
> Beaconside,
> Stafford.

The further courses:

> B.1 Mathematical Programming
> B.2 Data Processing
> B.3 Related Studies

will be held in July, 1966. Details will be issued nearer the appropriate time. The B series are intended to supplement the basic course.

Computing Science Degree Courses

We at the Staffordshire College of Technology are very pleased to report that the C.N.A.A. have approved our B.Sc. course in Computing Science which started in September, 1965. A similar course was started by Hatfield College of Technology at the same time. There are also two other courses of a similar kind at Wolverhampton and Brighton. A B.Sc. course in Computer Technology started at the Wolverhampton and Staffordshire College of Technology. A proposed B.Sc. course in Computing and Data Processing started at the Brighton College of Technology.

for the last two years, to remedy the gap which existed in our national knowledge of such education.

The "List" was published for the first time with the June, 1965 issue of the "Computer Bulletin", so that all members of the British Computer Society received a copy. It contains details of over 200 courses, tabulated under more than 100 headings. They cover such aspects as full or part-time, entry level, end-course qualification, duration of course, time spent on practical work and lectures, course bias and curriculum - divided between computer and non-computer subjects. The survey covers every type of educational institution, and the whole of the U.K.

Copies of the "List" are available to members of the general public at a price of 4/-d. Application for copies should be made to the Secretary, British Computer Society, Finsbury Court, Finsbury Pavement, London, E.C.2 (Telephone No. MONarch 6252), including an additional 6d. for postage on individual copies. Multiple orders will be sent post-free. Remittances should be made payable to "The British Computer Society" and crossed.

A Supplement to the list will be published in January, 1966, containing details of over 100 additional courses tabulated on a similar basis, and giving particular emphasis to centres of technological education. The supplement will be available from the BCS office although the price has not yet been decided.

It is the intention to revise the "List" annually and the next issue will be in mid-1966. Information has been collected up to now from BCS members or their contacts, but any College which wishes to have details of its courses included in the 1966 List should contact the Secretary of the BCS Education Committee Working Party 6 for questionnaires at the following address:

> I. S. Hughson,
> Programming Dept. (W.P.6),
> Royal Insurance Group,
> 9-17 Park Hill Road,
> Liverpool 8.

The "List" does not give separate College details when courses are nationally sponsored e.g. the City and Guilds Computer Personnel Certificate 319. Any details of Colleges running such courses would be agreed in the first place with the appropriate sponsoring institution.

Short Courses

There are still some vacancies on a MAC programming course for teachers at Brighton College of Technology; 4th to 7th April, cost £12. 10. 0d.

There are still some places available on a seminar on Computer
Education being held at Eton College on 1st April - fee £2. 2. 0d.
Enquiries to:

        Miss D. Law,
        Education Liaison Services,
        I.C.T.,
        Putney, S.W.15.
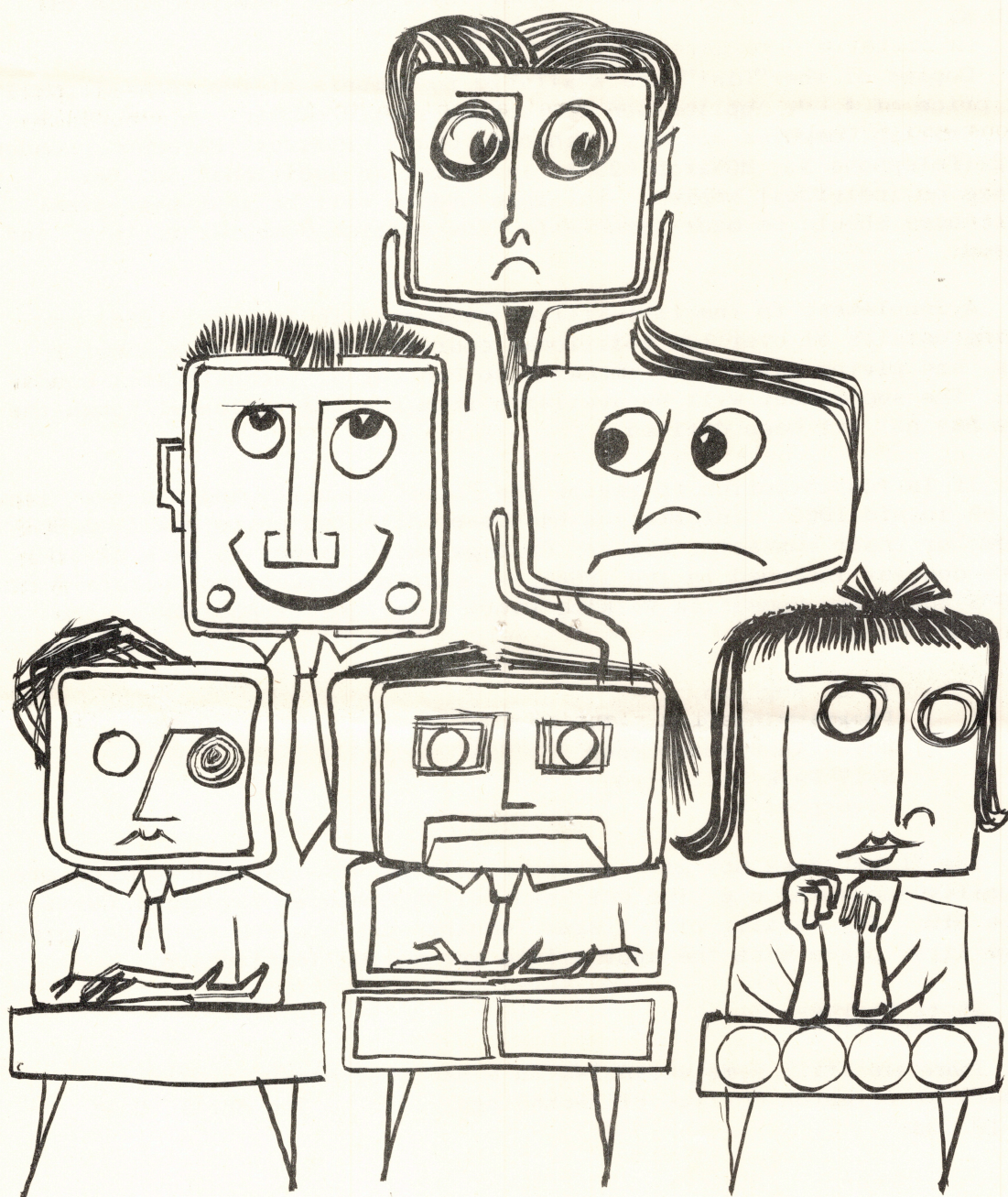
BOOKS - ARTICLES - REFERENCES

We should like to hear from readers details of any useful literature. If you do not wish to comment on it the reference only will be welcome. We would also be pleased to have adverse comment to enable all to be aware of dangers and pitfalls.

Please let us have your tips - we are all in need.

In bulletin O we gave:

We should like to draw members' attention to the following publications and articles:-

1. The New Scientist is running a series of articles under the title "The Gentle Computer". These started in Vol. 28, Number 465.

2. A list of films available for use in education was published in the B.C.S. Computer Bulletin, Pages 49-52, Vol. 9, Number 2, September, 1965.

3. "Computer for School mathematics", an article in The Mathematics Teacher, May, 1965.

4. Contemporary School Mathematics, 2nd series. Computers 2 F. B. Lovis (4/6d.)

5. "Computer Oriented Mathematics" booklet, March, 1963, NCTM, 1201, Sixteenth Street, N.W. Washington D.C. 20036 U.S.A.

6. "Guide lines for planning Computer Centres in Universities and Colleges" - Southern Regional Education Board - 130 Sixth Street, N.W. Atlanta, Georgia, U.S.A. (free).

7. Careers Research and Advisory Centre - Information Bulletin 11.

This edition we bring to your notice:-

1. "Teaching School Mathematics with a Desk Calculator" by W. D. Lewis (Westborough County Secondary School, Maidstone) published by Heinemann Educational books Limited.

2. Series of articles in Times Educational Supplement, 21st January, 1966, Pages 174, 175. Although the articles do not present a true picture of anything. One article on Automatic timetables generated interest and in a letter on 11th February, the Director of the Newcastle-on-Tyne University Computing Laboratory thanked people for their interest and co-operation in offering him timetables and indicated

he had now more material than he could use. There is also
a report on the B.C.S. Datafair. Some sytems demonstrated
at this symposium are of great interest to educationalists.

3.   "Education and Training of a Business Programmer" by
       J. E. Hanke, W. M. Boast & J. H. Fellers - Journal of Data
       Management 1965, 3, 6 pages 38 - 52.

4.   "Charles Babbage and Lady Lovelace - two 19th century
       mathematicians" - Dr. S. H. Hollingdale - Bulletin of I.M.A.
       Vol.2 No. 1 February, 1966.

5.   "Computer Training Equipment" - A supplement of the Computer
       Bulletin Vol.9 No. 3, December, 1965; price 10/6d. This
       should be of interest to all our readers. There are three
       main sections: Analogue Tutors; Digital Tutors; Educa-
       tional Computer Systems. It has been produced by working
       Party V of the Education Committee of B.C.S. and they feel
       it presents a cross-section of the total range of equipment
       available.
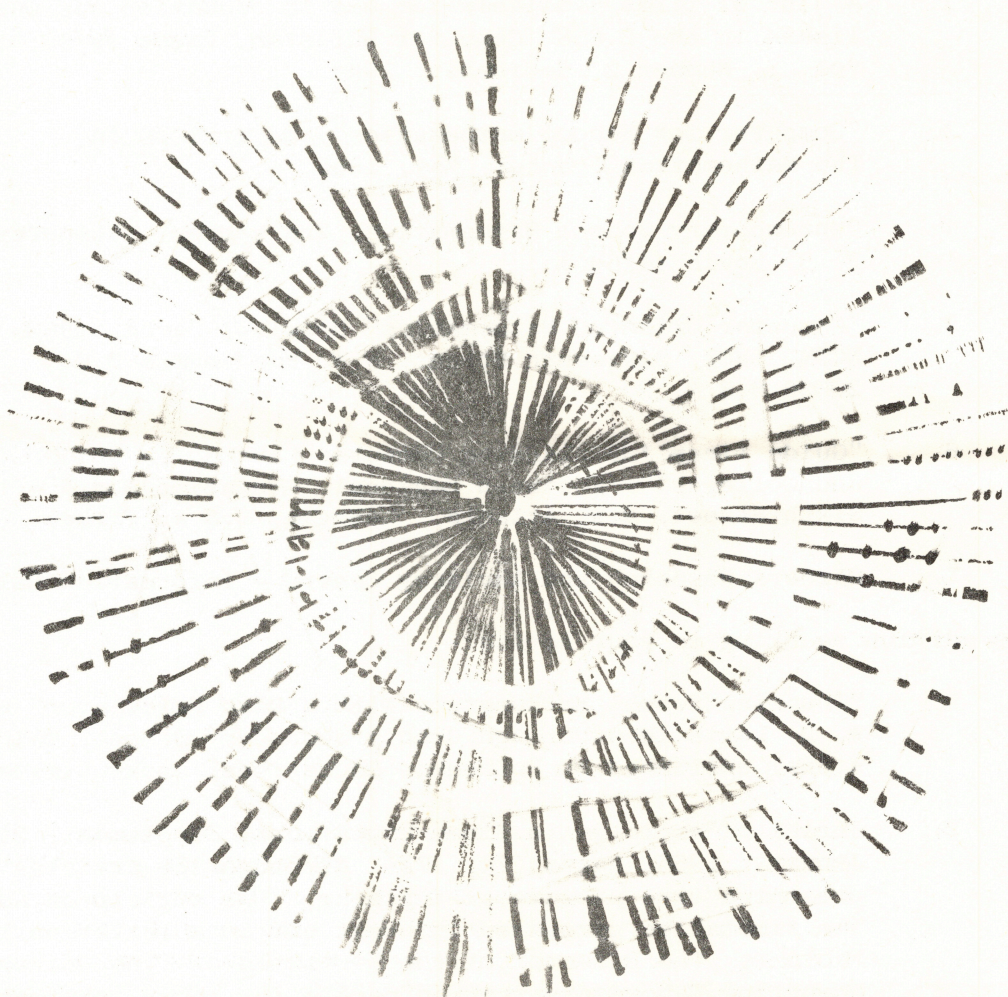
REQUESTS FOR INFORMATION

1.   319 Course

There have been requests from many sources for information about how the C and G 319 courses are progressing. The group has decided to try to collect information on how these courses are developing. We would be pleased if all colleges offering or operating the course would communicate their experiences to us. We would like to know about enrolment numbers, eventual numbers on the course, and in particular the organisation of the course, i.e. part-time day, block release or full-time. It appears that industrial concerns are not very happy with part-time day courses. We would be pleased to hear their views.

2.   Aptitude Tests

These tests seem to be used a great deal by computer organisations. We have had requests for samples and for evidence of their value or otherwise. Some of our members seem to be disturbed by the different methods of selection for jobs.

3.   A - Level Examinations

There appear to be moves to include computing in A-level courses. We would like to have any information relevant to this. In particular we know that computing is an integral part of the S.M.P. A-level course and we would be pleased to hear how their schools are coping with this problem and how they envisage this part of their course can be implemented when all the schools involved are doing A-level.

4.   Technical College Courses

We would like information about:-

(a)   C and G 320 course.

(b)   O.N.C. and H.N.C. mathematics courses involving computing.

MR.P.E.DUTTON
ST. JOHN'S SCHOOL
LEATHERHEAD
SURREY