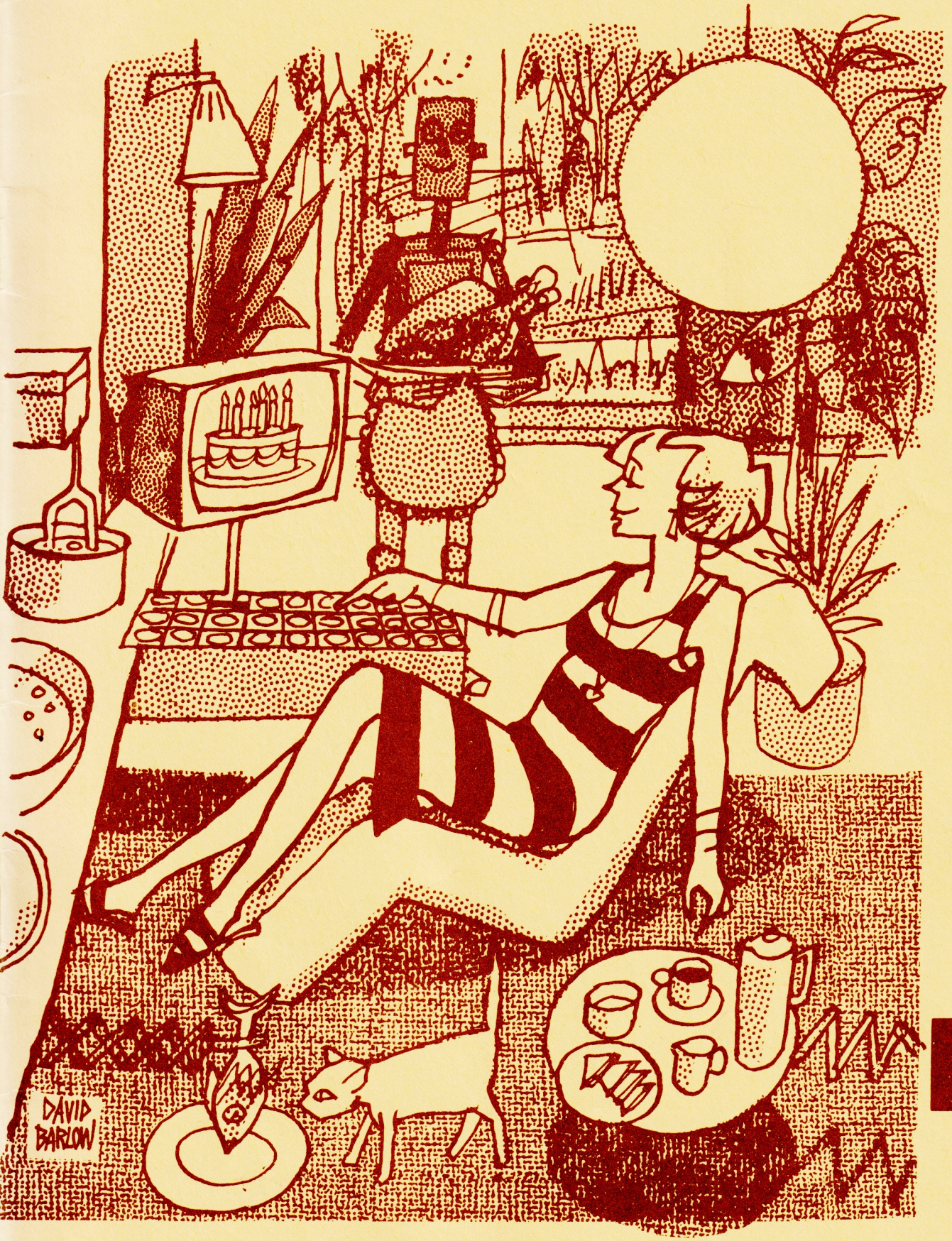
MICRO-SCOPE II



Newman College with MAPE

Contents

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Editorial

As we prepare for MAPE Conference 1984 it is time to count the gains and to set our sights on new challenges ahead.

The most optimistic of those inexperienced enthusiasts who created MAPE would hardly have dared to predict the achievements of the last three hectic years. Almost every primary school now has hardware, software and some teachers ready to use them. The quality of the best software has improved by giant strides each year. Many support agencies have been established, and many schools, centres and colleges have become centres of excellence for pioneering work.

Significantly, the initiative of the MEP has been followed up by the enlightened DTI subsidy, heading a substantial commitment of government support. We expect extensions. In correspondence with MAPE, Kenneth Baker (Minister for Industry and Information Technology) is very positive: 'I would agree that disc units and printers would benefit primary schools . . . a primary school extension scheme is a point we will have to consider . . . I certainly want to see continued expansion of computers in the primary sector.'

More recently, John Butcher (Under Secretary of State for Industry) has referred to the commercial opportunities in an international market of Britain's lead in educational software, and promised announcement of a new initiative to support this growing industry, with a key role for teachers.

It would be unlike MAPE to bask in self-congratulation. The password has always been – ON! Yesterday's solutions furnish tomorrow's problems, and new developments grow like Hydra's heads.

Yet in this my last editorial, I prefer to sound a different note even as we anticipate exciting new opportunities. I am not invoking Orwell's vision of 1984: we have no Ministry of Unity to divide us. But divisions exist which, ignored, could grow destructively. A few examples follow.

As the tide has turned decisively and irreversibly in favour of new technology in primary education, one detects a hardening of attitudes in a few of its adherents. The new confidence could easily lead to arrogance, dismissing those teachers less committed to rapid change as Canutes. Yet decisive research on consequences is still lacking: inspiration and hope light the way. And experience confirms that, in innovation, *optimum* rates of change are different from *maximum obtainable* rates.

Rapid change dislocates time-scales. Many observers have noted that young children come to terms with using computers relatively easily. The new orthodoxy is that learning is enhanced if children can determine their own learning strategies. But children also need access to cultural continuity and to stable adult role models. Manipulated 'Youth Culture' stands ready to exploit any new generation gaps. It is not just a matter of tolerance and sympathy towards teachers and parents who 'cannot adapt': what they have to offer is vital.

Other parents will seize on the vocational advantages of computer skills, in a diminishing job market, and create strong pressures at odds with educational judgements.

New curriculum ideas are exciting. It would be a sweeping reductionism, though, to conclude that space rockets are in and cavemen are out, or that exploration of artistic media for its own sake should be subordinated to the learning of techniques which have applications in project work. 'You cannot divide the seamless coat of learning.'

1984 has seen the launch of WISE (Women Into Science and Engineering). The main emphasis is on secondary school subject choices and career options, but WISE acknowledges that sex stereotyping begins in the home and is often reinforced in primary schools. We read that over 90% of children with home computers are boys (what do girls get?) Men still outnumber women in MAPE activities. David Barlow's sense of the ridiculous (cover cartoon) highlights the absurdity of sex stereotypes in the micro age. Male/female compounds other dichotomies: competitive/cooperative modes, aggressive/constructive behaviours, science/humanities. MAPE should seek to challenge false division.

We have already noted that the introduction of micros offers a few teachers new career opportunities at a time of relative stagnation in other areas. For the first time many teachers will find their professional expertise saleable on a wider market. It is too early to raise the spectre of privatisation, but the reification of a part of education as a commodity is potentially divisive of the profession and its image:

> 'For a salesman, there is no rock bottom to the life. He don't put a bolt to a nut, he don't tell you the law or give you medicine. He's a man way out there in the blue, riding on a smile and a shoeshine. And when they start not smiling back –that's an earthquake.'
>
> (*Arthur Miller,* Death of a Salesman)

Ron Jones refers, in 'MAPE matters', to the need for *MICRO-SCOPE* to keep its independence from commercial influences. The last thing primary education needs is a sectional pressure group capitalising on a commercial wave to secure a larger share of a cake that is already too small. Primary education can only advance successfully on a broad front. Perhaps the greatest achievement of MAPE so far has been to make significant progress without creating professional divisions. I recall the voices at MAPE's inauguration in 1981, resolving to work for changes in which educational goals, rather than technological drivenness, would be decisive.

ON, in unity.

John Lane
March 1984

* * *

We would like to place on record our gratitude to Barry Holmes for all the work he has done and support given for *MICROSCOPE*.

'How about you having a go, Master Bacon?'

Processes of writing: children's use of a word processor

Alistair Ross
Fox Primary School, ILEA

I always try and encourage children in my classroom to write for a real purpose. We write in class to record important things that have happened, ideas and opinions; we write to entertain and inform; and we write to reflect and sort out our own ideas and feelings. Above all, most of our writing is written to be read – and read by somebody other than the teacher! We make lots of class books, we make one-off magazines and we make books. This is very much in the tradition of Donald Graves' notion of children as authors: 'writing is a public act, meant to be shared with many audiences. . . . Publishing contributes to the sense of audience' (1983, p. 54). Becoming an author (which is much more than becoming a writer) means that 'children change from imposing their own understandings of process and content upon authors, to realising various authors can use process and content differently' (Graves & Hansen, 1983, p. 182).

This article is about how the use of a word processor enhances children's ability to become authors, and also subtly changes the processes of writing so that the children become more in control of these processes. The work described is with third and fourth year juniors, working with the TXED program, a package written by Research Machines, used on an RML380Z with a disc drive, and an Epson MX80 dot matrix printer.

Frank Smith (1982) separates the act of writing into two parts: composition and transcription. The two are distinct yet intimately related: the composer (the author) is concerned with ideas, grammar, the selection of words and phrases; while the transcriber (the secretary) has the physical effort of writing, of making it legible, with correct spelling, punctuation, layout, etc. The two functions are often performed by the same person, simultaneously (I am now sitting at the keyboard, coping with both problems at the same time), and this is the way that most children write creatively. But, as Smith points out, 'composition and transcription can interfere with each other' (p. 21).

My first approach to the word processor was thus to use it to separate the two processes of writing, in particular to help three third year children whose transcription problems were impairing their ability to compose.

The class were writing novels. Hard-backed, sewn-binding novels, with flyleaves, end-papers, frontispieces and all the paraphernalia of real books, and all of them made by the children. Most of the books were substantial – some were 5000 words long – and this sustained piece of writing stretched over many weeks. They researched stories, made notes on characters and locations, worked up opening paragraphs. Some of the bilingual children in the class made double-length books, with parallel texts in their mother tongue and in English. But three members of the class gave me cause for concern. While they could effectively create a sustained narrative, they had problems with handwriting, spelling, layout and punctuation that made them soon dispirited with their efforts.

One solution would have been to type their drafts for them as they wrote each section. While this would encourage them in their efforts, it would do little to help them overcome their problem, which (like that of many other children) was not merely one of requiring legibility in the final copy, but needing legibility in the drafts as well. Letting the children type drafts themselves is only a partial solution – not only is there a limit to the number of layers of Tippex that can be applied to a single piece of paper, but there are more fundamental constraints on the interaction between composition and transcription. As Smith puts it,

> The typewriter suffers from spatial and temporal disadvantages . . . A typewriter is just too mechanical in forcing the writer to compose in the direction the machine is designed to operate, from left to right across lines and from top to bottom down the page. It is not easy while the paper is in the machine to erase and insert, and particularly to put in marks that cannot be made with the machine, like an arrow down the side of the page . . . . Erasure and insertion are important and pervasive parts of writing.' (p. 136)

The pattern I used for these children was to allow them to type in their own drafts, and then to make corrections with them. They were already fairly familiar with the QWERTY keyboard from other computer work, and merely had to be introduced to the shift key and a single formatting command, .pp, which started a new paragraph. It was helpful to use the floating cursor as a pointer to prompt corrections: I could move it to the precise point of error and wait for a suggestion.

However, I took the precaution of copying the entire child-typed copy before correction,

and only correcting the second copy. This allows us to examine the original text for errors. The following three extracts show a progressive development of punctuation skills, particularly in the use of direct speech and of paragraphs. Before each of the lengths of text from which these extracts were taken, I had corrected the previous piece with the child, talking a great deal about the conventions of such punctuation.

1. they went to the castle the leader of the soldgier's said that were Lord Wolf lives he said.
he knocked on the door it opened it was benson yes? is Lord Wolf there? this way please.
Hello said Lord Wolf
the captain said have you seen a wolf here? his footprints lead to this castle.

2. The Vicor said "what is your name?"
My name is Sam ..
The Vicor said what is a matter? he said.
Im scared said sam".
"Why are you scared?".
Because the wolf every night theres been murders".
i know but be brave not scared".

3. Afterwards they went back to the castle. "whats going on here?" said tom then lord wolf came.
"why dont you join in its good fun.
"no thank you we have to go to bed".
Lord Wolf was talking to the new mayor.
"How does it feel to be the new mayor" said Lord Wolf. The new mayor was called sir Ivan.
sir Ivan said "it feels wonderful".

There was evidently an improvement in skills here, but how much of this was temporary and how much would be transferred back from the monitor screen to handwritten work remained to be seen. When corrected, the entire text was printed out on a suitable sized page and bound into the child's book, *The legend of the were-wolf* – 48 pages with illustrations by the author.

My next class was of fourth year juniors. We decided to produce a regular class magazine, called FOXFIRE! I particularly wanted it as a vehicle to develop a range of writing skills; I hoped that each issue would focus on a different style of writing – the first was short stories, the next oral history work (accounts and interpretations of interviews made by the children with older adults about the recent past). I hope that future editions will focus on poetry, science writing, etc. The magazine, incidentally, is now owned by the children as a co-operative: each subscribed to a share in a company we formed and helps appoint the directors, who purchase the materials we need from their own capital, sell the copies – and distribute the profits.

The TXED program seemed to be a good way to get this magazine typeset. This isn't a novel idea (Pixton, 1983), but I was interested now if we could use the word processor not merely to help with the editing process of writing, but with the composing function as well. Could children's ability to create a text be enhanced by the ability to write, rewrite, and generally play with the text? As Bryan has pointed out (1983), without a word processor 'the very act of writing anything at all had been such an effort that any idea of revising and rewriting was put aside as being much too great a task.'

Each child made a very rough first draft of a short story. It was emphasised that it was only a draft, and that it would be transferred to the computer. This typing in was done mostly by the children themselves (in one or two cases I helped, trying to reflect their written text exactly, errors and all: this was necessary for reasons of production deadlines!). We then printed out the text and discussed it – either as a small group or individually with the author. We looked at first at the story itself, trying not to comment too much on the transcription errors.

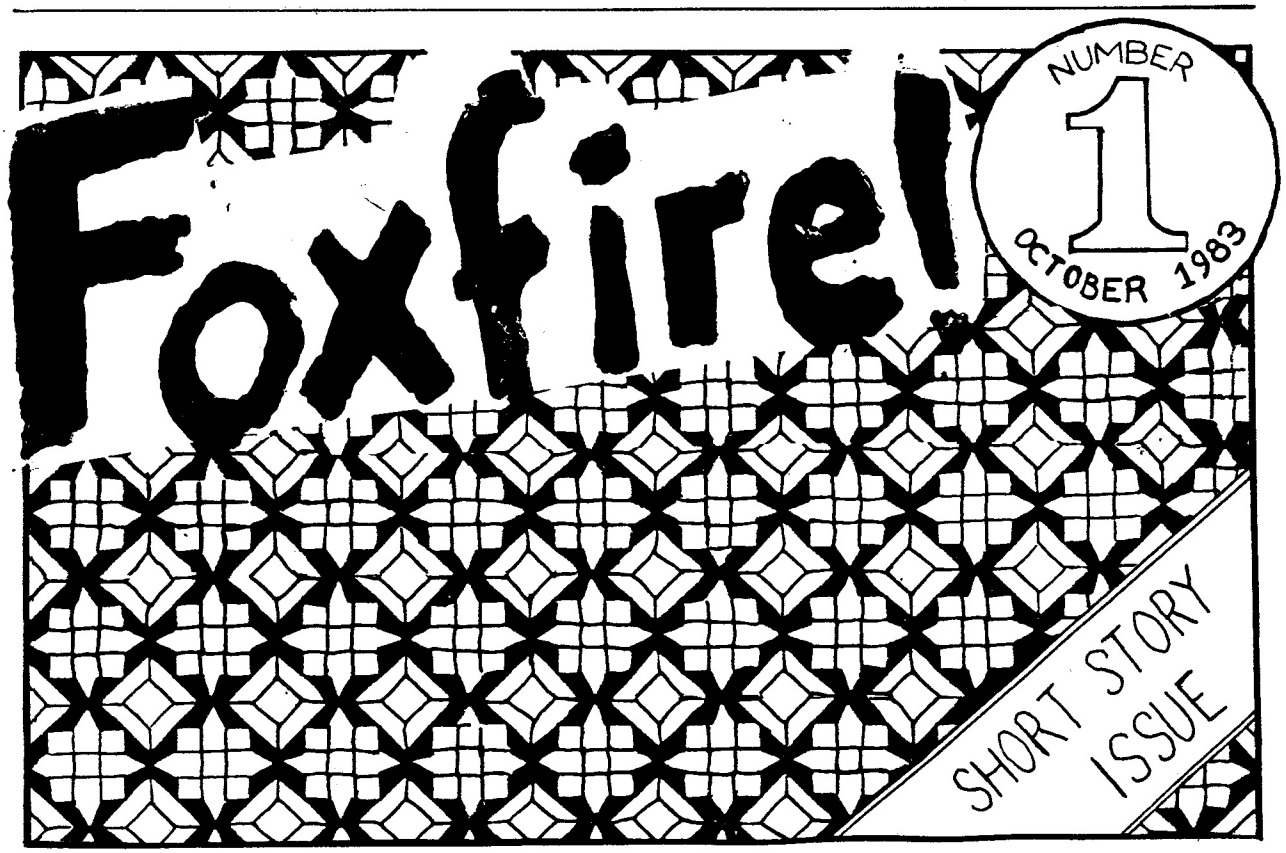
This first example was one girl's first draft.

The Haunted Dungeon

Once upon a time there lived an old man who thought he had cancer. Before long he was thinking about building a dungeon. He thought that if he could make one he could put models of ghosts, draculkas and if possible graveyards. He was determined to build one so big that it seemed it would come to no end. He worked at it day and night and sometimes went without food. He became quite skinny by the time he was eighty-four. When the dungeon was finished he bought lots of models of ghostly figures and dracula figures and he also bought an enormous graveyard. One day a dreadful thing happened all the models turned real and started to stab him. He cried for mercy but soon died. And thats why my story is called the haunted dungeon.

The act of writing, as Smith again points out (p. 121), is more than a simple progression of prewriting – writing – rewriting. The notion of the text changes in the author's mind as it is written down, and we have only captured above a 'final' part of the first writing. We haven't been able to see the processes that went on in the author's head. This becomes even more apparent when we consider the next stage.

I now introduced the author to the use of the floating cursor and the erase functions, so that she could move about the text freely inserting, changing and deleting. Thus we next see only her final copy after this process – we can't actually follow round her movement within the text. As well as demonstrating this attribute of the word processor, we talked at length about



the actual story. Why was the man initially 'old'? How did this fit in with his description later in the story? Was the mention of cancer relevant, or was it just an early idea that was abandoned as the story progressed in the author's mind? Why did the monsters come to life – was there some reason? If so, could the readers know about it? Why was the title mentioned again in the last line? Was not the ending rather sudden?

Back she went to the keyboard, and was soon able to present her second draft, which took into account some of the points discussed.

> The Haunted Dungeon
>
> Once upon a time there lived a young man who liked scary things. Before long he was thinking about building a dungeon. He thought that if he could make one he could put in it models of ghosts, Draculas, and if possible, graveyards. He was determined to build one so big that it seemed it would never come to an end. He dreamed that when he died he could be burried there. He worked at it day and night and sometimes he went without food. He became quite skinny by the time he was eighty-four.
>
> When the dungeon was finished he bought lots of models of ghostly figures and Dreaculas, and he also bought an enormous graveyard.
>
> He was happy at last. Then one day a dreadful thing happened. All the models came to life and started to stab him. He cried for mercy, but soon he died.

I again told her that I thought the ending too abrupt. How did the creatures come to life? Why? We also talked about some of the transcription errors. The final version had the first two paragraphs almost as above, then went on:

> He was happy at last. Then one night a dreadful thing happened. A flash of lightening hit the bars of the dungeon window. It bounced off and hit the models one by one. Slowly they began to move their jointys, and finally they came to life and were walking about the man.
>
> When they stabbed someone they changed to either a dracula or a ghost. The first person that they attacked was the man who had made the dungeon.

While this may not have all the literary qualities of Mary Shelley or Bram Stoker, I think that it does allow us to enter into the world of the composition of a story in the mind of a ten-year-old, and the word processor allowed her to change her story to make it more consistent than would otherwise have been the case.

Editing a text was often done by children other than the author. By 'editing', I now mean the process of correcting transcription errors, not of making changes in the process of composition. Smith again has suggested (p. 128) that 'editing one's own work can be boring, and probably should be boring . . . if the writer is interested in the text while editing it, then the editing is likely to be poorly done; the writer is reading its text for its content rather than its conventions.' So sometimes children corrected each other's work. This can be seen in the changes made to one child's attempts in the following two extracts.

. . . A one tike to yorkshire pleas/ That will be three pounds please the train leaves on platform fifteen in ten minitues. Katieran to the platform the train was just about to leave when she scrambled on. Shefound a seat and sat down. Suddenley she heard a voice say. "Whats a pretty little girl like you doing out on your own". . .

"A one way ticket to Yorkshire please."

"That will be three pounds, please. The train leaves from platform fifteen in ten minutes."

Katie ran to the platform. The train was just about to leave when she scrambled on.

She found a seat and sat down. Suddenly she heard a voice "What's a pretty little girl like you doing out on your own."

The next step will be to try and get children to compose completely at the keyboard, which will be potentially an even greater liberator. It ought to be possible for them to start by making rough outline notes, and then working their way through them, expanding notes to sentences, sentences to paragraphs, amending as they go.

Writing is an immensely complicated process. To write by hand requires the *simultaneous* exercise of a whole range of skills – of imagining out a story, of translating ideas and characters into words and phrases, of anticipating reader's predictions, of a vast range of mechanical movements to manipulate the pencil or pen, of knowledge of spelling, grammatical and punctuation rules . . . anything that helps free children to perform the act of creation better should be welcomed.

The use of the word processor is not just another skill to be learned, a necessity for life (and work) in the decades to come. Children should be able to use it, but not to make them good typists. I note that EDWORD was designed not by teachers of writing, but by those with "considerable experience both of teaching secretarial skills and computer-based curriculum development" (Weston, 1983). Good though EDWORD may be, its use – and the use of any word processor in primary education – should be to extend and enhance children's command of the processes of writing.

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Using the micro in topic work

Chris Robinson
Iver Heath Middle School

The Environmental Studies project in my class this term centres on modes of transport in our locality. Within five miles of our school we have four different railways, many main roads (including two major motorways and a third under construction), two different canals, and three airports, including Heathrow. A fantastic opportunity to go out and observe these different means of communication and learn history, geography, science, etc. at the same time.

At the centre of our classroom activity is a 00 scale model we are gradually building of part of an imaginary town. This features an airport, station, road and canal with interchangeable parts to enable the scene to be set at different periods in history. So where does the micro come in? No less than nine different programs that we currently possess have been (or soon will be) in use, in one way or another, as additional resources. Some examples follow.

A motorway intersection near the school boasts the largest roundabout in Europe. Many accidents were occurring on this half-mile racing circuit until the county council installed traffic lights. A humbler road junction nearer the school could, in our opinion, benefit from control lights. We carried out a census. There are twelve possible routes through the junction. For each we counted numbers of lorries, buses, cars, motorbikes and bicycles and converted them to DOE standard 'passenger car units per hour' figures. In addition, extra data were collected on average clearance times for vehicles following each route. The flexible database program *VU-FILE* was used to store the data. The page layout had to be formatted and twelve pages

(one for each route) entered, providing the facility of being able to find quickly the route that carries the most lorries (for example).

A model traffic light I had made was coupled via an I/O board to a computer and children 'taught' it the correct sequence of lights so it could operate properly. Another related program used was a simulation of a pelican crossing where children give the lights the correct command sequence to enable traffic to flow and a child to cross safely. When considering where commercial road transport is bound and what it is carrying, the Dudley program *Car Journey* is useful. Children operate a delivery service about the country in this very good simulation. Two general programs assist the child's knowledge of their country: *Map of UK* is a glorified atlas which helps children locate towns easily and *Map* tests them on their knowledge of the location of principal towns whilst increasing map reading skills.

One group of children visited Heathrow airport. There we were lucky enough to go on board various aircraft, including Concorde, and sit in the navigator's and flight engineer's seats and goggle at all the controls. Back in class, the flight simulator program is more than a match for any of them.

Another group visited a canal lock and helped a boat through. The free MAPE program *Locks* has helped them recreate the required sequence.

The railways provide what I consider to have the greatest potential. We hope soon to have the computer controlling a model train back and forth along the track laid through our model, and operating level crossing barriers, railway signals and road signals at the correct time.

Sources of software

All these programs are for the ZX Spectrum; an asterisk indicates that BBC and 480Z versions are also available.

**Car Journey* £9.95 from Heinemann Computers in Education.

Flight Simulator £8.95 by Psion (Sinclair outlets).

**Locks* free to 1983 MAPE members.

Map free through Micronet.

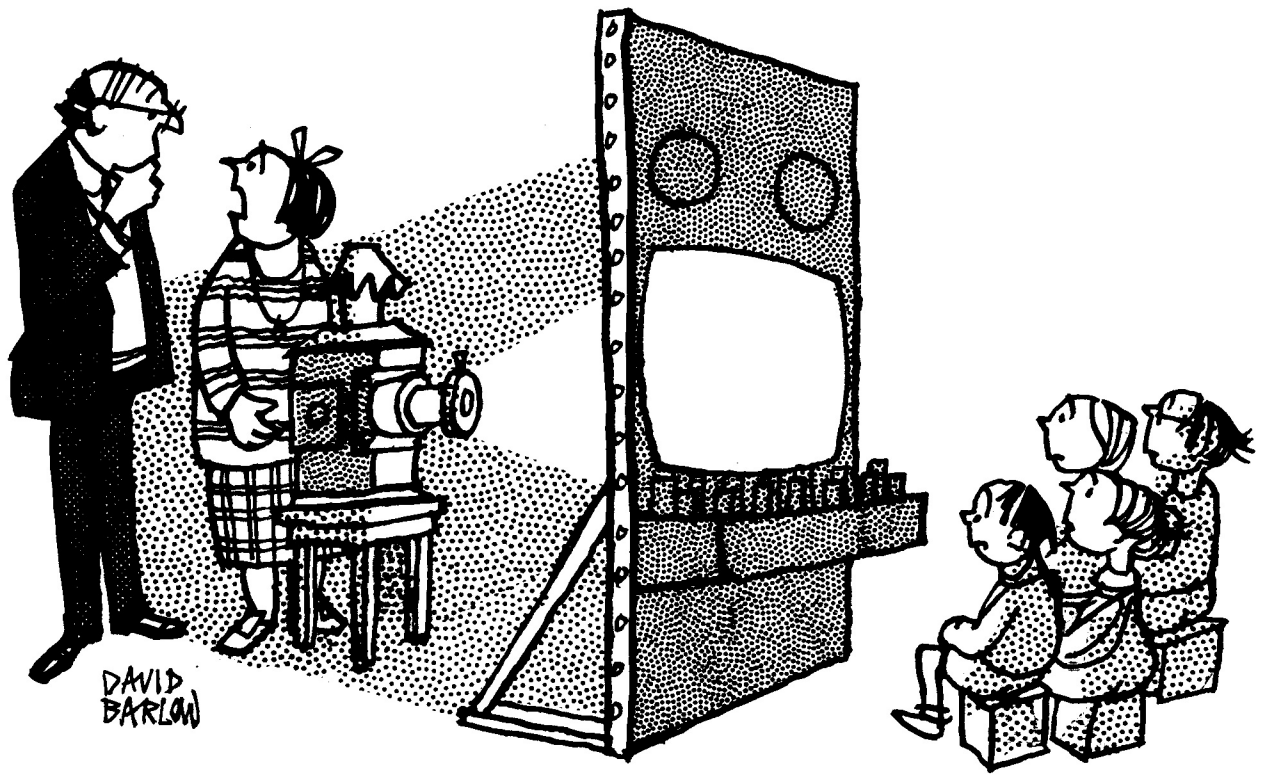
**Map of UK* £11.95 from KUMA computers, Maidenhead.

Model Railway Controller (still being prepared).

Pelican £3.50 from MUSE.

Traffic Light Controller pack (Being rewritten for Spectrum – was ZX81).

VU-FILE £8.95 by Psion (Sinclair outlets).



'We really must get one – they're beginning to twig!'

Learning together: a classroom experiment

Judith Exley
Roehampton Church School

> 'To be an educational trendy you've got to be "into" computers and "into" technology . . . The technology is well able to look after itself. It is with us to stay. Accepting that fact, let us stay off the band wagon and continue with what we are good at, opening children's minds to the wonder and beauty of all that is around, at least for the time being!'
> Jack Cornall (*Head Teachers' Review*, Spring 1983)

> 'Computers differ from other teaching aids in their flexibility and ability to interact with the user . . .'
> Alan Maddison (*MICRO-SCOPE* 7, November 1982)

> 'Computers can provide children with new possibilities for learning, thinking and growing emotionally as well as cognitively.'
> Seymour Papert (*Mindstorms: Children, Computers and Powerful Ideas* — Harvester Press, 1980)

It is no wonder that the average primary school teacher is confused — it is almost a cliché to say 'computers are here to stay'. The question at issue is 'are they here to stay in the primary school?'. If so, in what way are they to be used?

You may be one of those teachers who is interested in experimenting with a microcomputer in your own school, but not prepared for the heavy financial commitment that is at present involved with an expensive machine like the BBC Model B or Research Machines Limited's 480Z. This was my own position when I started my experiment in March 1982. I believed that it was important to see if I could utilise the children's own interest in microcomputers. The increase in child ownership has strengthened my resolve to continue to examine ways in which the teacher can help children to make better use of them at home and in school. Another reason why I embarked upon my approach to using microcomputers in the classroom was a purely selfish one. I found them exciting and felt, through my experience with my own three children (all of whom are of primary age), that this was a situation in which I could usefully work alongside the children. We could learn together. I did not feel that by standing outside the scene I could possibly make any judgement about the place of the microcomputer in the primary school.

The reasons for my interest in microcomputers led to my objectives. It is important to say at the outset that one of my objectives was a negative one. I was determined not to use the microcomputer to run prepackaged programs, at least not at this stage.

I use the microcomputer to:

(a) enable children to think logically through writing simple programs;
(b) encourage children to think mathematically by presenting them with simple programs to examine and alter;
(c) assist the children who own microcomputers to use them to extend the work they have started at school.

My work has been done on the Sinclair ZX81 microcomputer with 1K memory which currently sells for less than £50. There is a discount for schools on this machine which varies from LEA to LEA. My school also purchased a printer costing about £40 and a 16K extra memory pack. This represents the total purchases of the school at the present time, but I also use my own ZX81 and Spectrum (16K Spectrum costs about £100, or 48K about £130), and seven members of my class have a ZX81 which they are encouraged to bring to school. We have found that parents have black and white televisions available which they are willing to donate or loan to the school during term time.

My work first started with a maths club. This was an easy way to begin to observe and experiment, as I was able to offer the children a variety of activities and work some form of rota system for having a turn on the microcomputer. We have four or five microcomputers operating during the maths club at the present time.
In September of 1982 I became a class teacher of third year juniors and now have some experience of how to integrate my work with the microcomputer into the classroom situation. Most of the children I work with would probably be described as above average and it is up to the reader to decide how far the work I do and the experiences I have had are relevant to their own situation.

Starting with my low cost machines, children firstly have to learn how to use the keyboard and type in programs. (The ZX81 has the familiar QWERTY keyboard of a typewriter). I tried published programs which give the

children keyboard practice, but found the children easily became bored by them. A more successful approach was:

(a) to give the children short games programs of approximately 15 to 20 lines to type. A small group of three or four children needs assistance from the teacher or from a child who already has this experience from using a microcomputer at home. Then these children teach others. The motivation is simple but effective because there is a game to play when the program has been successfully typed in. (There are many games books available on the market from about £2 upwards).

(b) by giving the children a work card with a simple drill and practice program. The work card is reproduced in Fig. 1. This program produces simple addition sums like 9 + 15 and requires the child to type in the answer and indicates whether his answer is correct or incorrect. The numbers selected are less than 30 (lines 20 and 30) and vary due to the RND. (RANDOM numbers) command. The INT (INTEGER) command ensures that the numbers are always whole numbers. If the child types in the right answer then line 100 operates and 'WELL DONE! ANSWER = 24' appears on the screen. If he is wrong then he is told 'YOU ARE WRONG. TRY AGAIN' (line 80).

```
10 REM ADDITION PROGRAM
20 LET A = INT (RND * 30)
30 LET B = INT (RND * 30)
40 LET C = A + B
50 PRINT A; "+"; B; "="; "?"
60 INPUT D
70 IF C = D THEN GOTO 100
80 PRINT "YOU ARE WRONG. TRY AGAIN"
90 GOTO 50
100 PRINT "WELL DONE! ANSWER = "; C
110 GOTO 20
```

First type this program in and then press RUN to see if it works.

(a) Can you make this program easy enough for Class 7 (First year infants)?

(b) Can you make the program harder?

Fig. 1 Work Card Addition Program

These two approaches familiarise the child with keyboard but the second also leads into my objectives of encouraging the child to write simple programs and to think mathematically. If we consider the work card (figure 1), the child has to understand:

(a) random numbers – a good analogy to use is dice throwing;

(b) integers and fractions (the children often remove the INT command from the program and verify for themselves that the problems will then take the form of decimal fractions)

(c) variables. They find this difficult to grasp at first but this work card is possibly one of the simplest ways to introduce it. Connected with variables in this example comes an understanding of the commutative law of addition, i.e. a + b = b + a.

Given that the children have a real understanding of these ideas then changing the program becomes an easy and satisfying task. For instance, changing the multiplier 30 (in lines 20 and 30) to 10 or to 100 produces easier or harder sets of sums respectively. Some children then used their altered program with a class of first year infants and showed them how to use the keyboard in order to type in their answers.

Figures 2 and 3 show examples produced by a child aged nine and a child of ten as a follow-up to the work card. The value of these examples is difficult to convey to a reader who is unable to listen to the discussion which occurs in a group of three or four children whilst they grapple with the ideas involved. I believe that an added value of this exercise lies in its encouragement of logical, structured thought.

```
10 REM ADDITION PROGRAM
20 LET A=INT (RND*30)
30 LET B=INT (RND*30)
40 LET C= A+B
50 PRINT A; "+"; B; "="; "?";
60 INPUT D
70 IF C=D THEN GOTO 100
80 PRINT "YOU ARE WRONG, TRY AGAIN"
90 GOTO 50
100 PRINT "WELL DONE, ANSWER = ";C
110 PAUSE 60
115 PRINT
120 PRINT "WOULD YOU LIKE ANOTHER GO?
    PRESS ""Y"" FOR YES OR ""N"" FOR NO"
125 INPUT A$
130 IF A$="Y" THEN GOTO 150
140 IF A$="N" THEN GOTO 170
150 CLEAR
155 PRINT
160 GOTO 15
170 PRINT
180 PRINT "BYE,BYE"
```

Fig. 2

```
5   LET P=1
12  REM MULTIPLICATION PROGRAM
2Ø  LET X=INT (RND*12)
3Ø  LET Y=INT (RND*12)
4Ø  LET Z=X*Y
5Ø  PRINT X;"*";Y;"=";"?";
6Ø  INPUT W
7Ø  IF W=Z THEN GOTO 1ØØ
8Ø  PRINT "BAD LUCK, HAVE ANOTHER GO"
85  LET P=P+1
9Ø  GOTO 5Ø
1ØØ PRINT "THAT'S THE ANSWER, IT IS ";Z
11Ø PRINT "NUMBER OF TURNS=";P
```

Fig. 3

From these tentative beginnings I saw two possible uses of the microcomputer for my class. It could assist them to think mathematically, through structured ideas and challenges presented by me. Also, the children's spontaneous interest in games and graphics could be harnessed to their creative interest in writing games for themselves.

The second line of approach marked an alteration in my own ill-formed philosophy. I had at the outset decided we would not use the microcomputer to play games, as this seemed to me to be a leisure activity and a distortion of the microcomputer's potential educational value. But I found the children were typing in short games and asking themselves how certain actions of the game were achieved. For example, I am frequently asked 'Which program lines make the graphics flash across the screen?', to which I had to admit that I did not know. This was a wonderful experience for the children: we were learning together, where there were no right and wrong answers, only trial and error experiments together with long and fruitless discussions. Or were they fruitless? The children's ideas were as valid as mine.

I was beginning to discover that finding the answers to the children's questions together with thinking up ways of extending my ideas was becoming an overwhelming burden in terms of time. However, I met Prof. David Johnson, whose ideas have proved invaluable. (His book, Johnson, D. C., *Explore Maths with your Micro: A Book for Kids* is published by Heinemann Computers in Education.)

With adaptations from his material, designed for the ZX81, the Spectrum and other computers, I was able to pursue my line of approach of using the microcomputer to help children to think mathematically. Prof. Johnson has taken basic mathematical ideas (for example, factors) and written short programs which the children type in and run on the microcomputer. He has then set questions to direct the children to examine what the program is doing, together with what he calls 'challenges' to ask the children to alter the program to produce more sophisticated tasks. Fig. 4 shows the program in flow chart form; Fig. 5 is the adapted work sheet that I use.

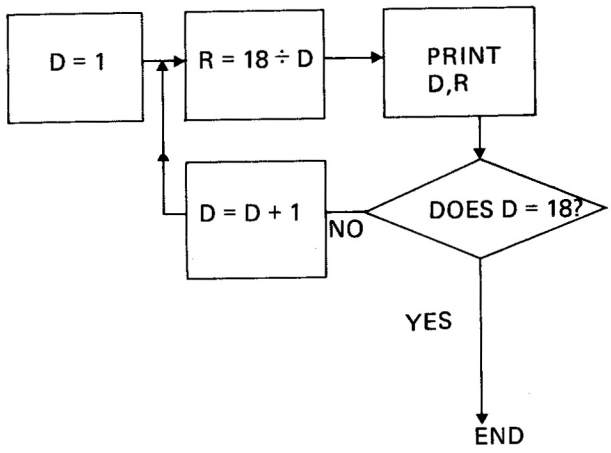


Fig. 4

The children made certain adaptations to the program. For example, they added line 25 PRINT" ". This was inserted because it made the screen output easier to read by producing a blank line between the lines of output on the screen.

Question 2 (see Fig. 5) is the point at which the teacher's intervention is required in order to steer or encourage the discussion between the children. The subsequent dialogue is mathematically more rewarding than I have been able to achieve by other means. If real understanding has taken place at this point then the challenge presents very few problems, but the sense of achievement experienced by the children is immense. I would argue that children who complete the challenge successfully have been involved in:

a) mathematical discussions;
b) the setting up of hypotheses and subsequent testing;
c) reaching a real understanding of factors.

The other interest of the children which revealed itself was in plotting and using graphics. This requires some instruction in the use of BASIC. I compiled work sheets which utilised not only my own ideas and those of Prof. Johnson, but also material I had received from one of the school's parents, Jonathon Chapple,

PART 1: FINDING FACTORS

Type and run the following program. We will call this program FACTORS 1,

```
1Ø FOR D = 1 TO 18
2Ø LET R = 18/D (/ means 'divided by')
3Ø PRINT D, R
4Ø NEXT D
```

Copy the two columns of output from Program FACTORS 1 and use this to help you answer exercises 1–3.

Exercises

1. (a) What are the numbers in the list on the left?
   (b) What are those on the right?
2. What is the relationship between the numbers D and R in each pair? (The list begins: 1 and 18; 2 and 9; . . .)
3. Which numbers or values for D divide 18 a whole number of times?
   (Hint: When is R a whole number?)
   Your answer to exercise 3 gives the set of *factors* of 18.
4. Revise lines 1Ø and 2Ø in Program FACTORS 1 to find the set of factors for
   (a) 16
   (b) 28 (You can use CONT (press C) to get a complete list – write down the factors first)
   (c) 49 (use CONT)

Investigation

(A challenge) Add a new line:

```
5 INPUT N
```

and revise lines 1Ø and 2Ø so that you can use the program to find the factors of any number N. Call this program FACTORS 2. Use Program Factors 2 to find the factors for the following numbers. You will have to enter a number for N when the ? appears after you press RUN.

(a) 16 (A 'test' to see whether your program works – compare the answer with your answer to exercise 4(a.))
(b) 20
(c) 37

What is different about the number in (c)? Find some more numbers whose only factors are 1 and the number itself.

Fig. 5

```
1Ø PLOT Ø,Ø
2Ø PLOT Ø,43
3Ø PLOT 63,43
4Ø PLOT 63,Ø
RUN
```

Plot other points. Can you predict where they will appear?
Try to write a program that will plot the points you ask it to.
(Hint: Use letters (variables) and assign values. Use the variables X, Y as we do in co-ordinate geometry.)

Fig. 6

ACTIVITY 6 SQUARES AND RECTANGLES

Type the following

(Line One)

```
1ØØ FOR Y = ØTO 4Ø
2ØØ PLOT 3Ø, Y
3ØØNEXT y
RUN
```

Now add:
(Line Two)

```
4ØØ FOR X = ØTO 6Ø
5ØØ PLOT X, 2Ø
6ØØ NEXT X
RUN
```

Call the Program LINES.
Can you make the computer draw other lines:
(a) *parallel* to Line One?
(Hint: Add lines to the program between lines 2ØØ and 3ØØ. Try 21Ø PLOT 2Ø, Y)
(b) *parallel* to Line Two?
(Hint: Add program lines between lines 5ØØ and 6ØØ.)

Challenges (NEW programs)

1 Make a square with side 3Ø units.
2 Make a rectangle with sides 2Ø units and 6Ø units.
3 Draw two squares – one neatly inside the other.

Fig. 7

who is Director of Systems and Computing, for Hertz Europe Ltd. His book, *I Wish I Knew About – The Spectrum and ZX81* is published by Pitmans, and is designed as a children's introduction to the Spectrum and ZX81.

Figure 6 gives an example of a work sheet I use, based on Mr Chapple's work. The program plots four 'points' in the corners of the screen. (Each 'point' is a small rectangle.)

The program in Fig. 7 produces horizontal and vertical lines. By now those of you with no programming experience can probably follow this simple program. After the children have acquired these skills they have spontaneously gone on to create their own grid games such as noughts and crosses. From this point they have recently moved on to using the UNPLOT command because they wanted to make objects

move across the screen. This is the principle which is the basis for many computer games and it gives the children enough material to start creating others. Again, it is the discussion and interaction between the children, that I cannot adequately convey to the reader, which is one of the great benefits of this work.

Implications for the classroom

I have found the work with my class exciting and rewarding, but it has been a slow process to reach even the tentative conclusions I have come to. Above all, I have learnt that the microcomputer does not free the teacher to undertake other work with children. As with much learning in the primary classroom, the teacher needs to listen to the children and then to gauge how far and when to intervene in the learning process or the ongoing discussion.

Progress has also been slow in terms of finding ways in which to fit the use of the microcomputer into my classroom timetable. In relation to content (i.e. co-ordinates or factors), I have not felt it necessary for every child to cover this area of mathematics using the microcomputer. Rather, it was important that every child engaged in the mathematical thought processes required to change and alter programs similar to the examples given. Perhaps my highest priority in these first stages has been to ensure that children are engaged in mathematical thought and enquiry rather than ensuring they cover the same topics.

By rotating practical activities between groups of children it is possible to incorporate the use of the microcomputer. The children found it very frustrating to write copies of a program they were attempting to design; therefore we purchased a printer. With the aid of the printer the children working together can each take away a copy of the program as it stands. They often return with some fresh ideas to start work again, having had a copy to look at.

My observations also lead me to believe that two to four children should work together because it is the discussion and interaction of ideas which is perhaps the most valuable outcome of this work. The microcomputer does not give the children a page record of ticks and crosses. The program works, or it does not. If it does not, then the group have to return to the listing of their program to start finding out why it does not do what they want it to. The children have to review each line of the program and set up some kind of hypothesis for what each line is doing. You usually find that someone will suggest an alteration to a particular line and the other members of the group will want some justification from him for this.

Another pattern which often occurs is that several alterations are made to different lines and if this is not successful the children will restore the program to its original form and start a new 'rethink'. In this way the children are actively learning by correcting their own mistakes. Often our understanding is only partial. By discussion and interaction the children are helping each other to clarify their thoughts and comprehension of the current problem. Turning to the teacher has not produced ready solutions. I have been learning alongside the children and this has been valuable for them and me. I am not someone who is an authority, but someone whose opinions are as valued as those of other members of the group, whose suggestions may as easily fail as their own.

In conclusion, I can only say that if there is a microcomputer set up in my classroom it is always surrounded by children – and this is with a class who have been exposed to the microcomputer for nearly a year. The children have created their own problems and have sought their own solutions in a way that I have previously been unable to engineer. Parents contact me asking, 'What is this microcomputer they so desperately want for a present?'.

Call for papers for an edited volume on Communication and Simulation

Contributions are being invited for an edited volume to be entitled: *Communication and Simulation*. The volume is being planned for publication in late 1985/early 1986. Its scope is to be as large and as interdisciplinary as possible, ranging from *intra-group behaviour* (counselling, social networks, language, role rehearsal . . .), through *inter-group relations* (discrimination, language, international relations, minorities . . .), *organisations* (management, legislation, judicial processes, decision-making, planning, . . .), to *mass media and technology* (advertising, the press, computers man-machine interfaces . . .).

It is planned to publish the volume in advance of the 17th international conference of ISAGA (International Simulation and Gaming Association), to be held at the University of Toulon in June 1986, on the general theme of communication; announcements will be appearing in the specialised press nearer the time.

Potential contributors to the edited volume should write either to: David Crookall, University of Toulon, 83130 LA GARDE, France; or to Danny Saunders, The Polytechnic of Wales, Pontypridd, Mid-Glamorgan CF37 1DL, Wales.

Tanker: a small piece of evaluation

Bill Bailey
University of London Institute of Education

Before there can be literary critics there has to be literature. In the world of primary educational computing there is an initial need for a wide variety of software ideas, exploring the potential of what is in effect a new medium. A stage where faith, enthusiasm, innovation, anecdote and casual observation are appropriate. However, since vast sums of public and parental money are being spent on hardware and software, some form of accountability is inevitable and systematic evaluation will become a much more prominent part of the scene.

But to evaluate the use of the micro is like evaluating the use of the book! One is inevitably evaluating the software. I would like to present briefly here the results of a small-scale evaluation of a particular program, focussing on a narrow aspect of its effectiveness. Micros can enhance motivation, maintain attention, stimulate relevant discussion, change children's attitudes, liberate the teacher, etc., etc. Here we are merely asking: 'If it aims to teach something, does it?'

The program is one of a series of six produced by ULIE on the theme of 'estimation'. Each program maps numbers into a different context using the graphical potential of the computer. A problem is presented and the child is invited to make an estimate. The programs go beyond estimation into successive approximation, because they allow the child to see the discrepancy and to try again – as often as he/she likes.

The particular program which we are concerned with here is called *Tanker*. Numbers are represented as angles, or bearings, from 0 to 359 degrees. It would be easy enough to draw an angle on the screen, invite the child to make a guess, and then say 'Right!' or 'Wrong'. However in this program the child can see whether he/she is close, way out or right. He/she gets an idea of the discrepancy, and is allowed to use this knowledge to have another guess. In fact he/she can go on changing the estimate indefinitely until the target angle is matched. There are also no time constraints. If you want to discuss, argue, or go out to the playground for twenty minutes, the program waits indefinitely for your entry!

The DTI machines have good clear graphics capability and sound. These are often used as a reward sequence for correctly answering a question. This seems an under-exploitation of the medium. Replacing the tick in the exercise books of the 19th century with a 20th-century electronic tick doesn't change the fact that the reward is extrinsic to the problem. In the 'Estimation Programs' the graphics have been used to create a scenario in which the problem can be defined and to provide the necessary information relevant to the assessment and refining of one's estimate. The graphics are therefore intrinsically used.

Briefly, the scene is as follows:

An oil tanker is leaking oil into the sea and causing pollution. Marine life, represented by a whale, is threatened. A submarine is called up to sink the tanker and to burn up the oil slick. In order to emphasise that the torpedo serves a benign purpose, the crew is visibly rescued and it is made quite clear that it is a deserted environmental hazard which is being removed.

The tanker appears at a randomly determined position around the 360 degrees and the child is asked to estimate its bearing from North. Once this estimate is entered the submarine rotates to that bearing and looses off a torpedo. The discrepancy between one's guess and the tanker's position is obvious. After successfully adjusting the angle a cross in the tanker's engine-room is hit, the ship disappears and the oil burns up. The whale then expresses its approval. (There are options available to change the range of angles operated in, and the step size can be adjusted.)

In the course of a child development diploma study, Dilys Skan undertook to find out whether playing *Tanker* had any effect on children's skills in estimating angles. Two groups of children, eight year olds and ten year olds, were used. They were subdivided into an 'experimental' group and a 'control' group. All the children were given a paper-and-pencil test first. This consisted of two equivalent forms, A and B. Half of each group did the A form and half the B. These were reversed at the end, to form a post-test. The test was a page of drawn angles, at various orientations. The child was expected to study the angle, to make a guess as to its size in degrees and to write this on the paper. If the child was correct a score of 5 was given, 4 was awarded for a guess which was within 5 degrees, 3 for within 10 degrees, 2 for within 15 degrees, 1 for within 20 degrees, and 0 for any guesses which were outside this range. Each child had a total score for the 20

Table 1: First/second year experimental group

Name	*Points gained in pre-test*		*Points gained in post-test*		*Difference between pre & post*
Sarah N.	49	B	62	A	+13
James	65	B	81	A	+16
Lucy	65	A	63	B	− 2
Mhairi	58	B	76	A	+18
Roland	43	B	80	A	+37
David	39	A	43	B	+ 4
Tamsyn	40	A	55	B	+15
Sarah W.	44	A	51	B	+ 7
Fiona	27	A	57	B	+30
Kieran	58	B	80	A	+22

Table 2: First/second year control group

Name	*Points gained in pre-test*		*Points gained in post-test*		*Difference between pre & post*
Mark	70	A	50	B	−20
Simon	59	A	47	B	−12
Darren	53	A	35	B	−18
Joanna	63	A	58	B	− 5
Melanie	54	A	44	B	−10
Alison	74	B	79	A	+ 5
Georgina	42	B	51	A	+ 9
Justin	51	B	62	A	+11
Sarah	32	B	40	A	+ 8
John	52	B	68	A	+16

Table 3: Fourth year experimental group

Name	*Points gained in pre-test*		*Points gained in post-test*		*Difference between pre & post*
Michael	62	A	64	B	+ 2
Andrea	69	A	71	B	+ 2
Mark	41	B	57	A	+16
Terry	63	B	62	A	− 1
Kathryn	40	B	48	A	+ 8
Joanna T.	44	B	57	A	+13
Alison	55	A	67	B	+12
Joanna H.	64	A	76	B	+12
Amanda	31	B	45	A	+14
Anthea	20	A	41	B	+21

Table 4: Fourth year control group

Name	*Points gained in pre-test*		*Points gained in post-test*		*Difference between pre & post*
Christopher	74	A	81	B	+ 7
Emma	52	B	52	A	0
Jennifer	57	A	65	B	+ 8
Julie	50	A	69	B	+19
Beth	42	A	53	B	+11
Amanda	54	B	40	A	−14
Richard	55	B	61	A	+ 6
Alastair	52	B	40	A	−12
Anna	57	B	37	A	−20
Ashley	68	A	60	B	− 8

angles which were in the test. The experimental group then played *Tanker* individually for 20 minutes. The control group did not. The scope of the study did not allow for the testing of anything but short-term gains. After the *Tanker* session was over each child in the experimental group was given the other version of the paper-and-pencil test, and again asked to write down their estimates of the angles presented. The control group also completed the other form as a post-test.

The results are presented in tables 1 to 4.

The scores for the control group were not significantly different between the two testings. If the game was great fun but ineffective, we would expect the same result for the experimental group. However, the experimental groups in both the age ranges showed highly significant gains in their angle estimation scores on the post-test. So even as short a time as twenty minutes, without the benefits of discussion with a partner, produced changes in the children's ability to estimate angles. This doesn't mean, of course, that a further control group taught by more conventional methods wouldn't also have improved, but the software runs itself, there is no marking, it maintains attention, and the children seemed to find it fun.

Reference

Skan, D. (1983) *Microcomputers in Primary Education: An Evaluation of Some New Software*, Special Study for the Diploma in Child Development. University of London Institute of Education.

MAPE matters

Ron Jones
Chairman of MAPE

1984 Rings in the changes

An organisation which has itself been built upon the need for change should be better prepared than most to show its flexibility and its positive approach to unexpected internal changes. I hope that MAPE has shown this over the past few months, for it had a hectic start to the year.

Sadly, Barry Holmes has found that the many pressures on his time have forced him to drop the heavy burden of being our secretary. We will certainly miss him on the Council for he was a founder member of MAPE and has done a great deal to nurture the development of our association. I am sure that you will join me in thanking both him and his stalwart helper, Wendy Richardson, for the very many hours spent on our behalf. Who else answered the many queries with such patience and who else put those thousands of copies of *MICRO-SCOPE* in the envelopes, not to mention the extra goodies we are always thinking up as a service to our members?

Each 'extra' does of course add an enormous burden to the secretariat. However, the changes which we have introduced and which are explained below should relieve this pressure and at the same time allow us to continue to include 'extras', as well as absorbing far more members into our organisation.

MAPE administration

Inside the back cover of this issue is a 'Routeway' showing the appropriate addresses for various services, Membership will run for 12 months from the date of registration, rather than for a calendar year. The current rate for UK members is £8.50, for overseas members £12 – this is to cover heavy postal charges. News from overseas and the chance to exchange views are especially welcome. Please renew membership promptly, and invite colleagues to join. Every reminder saved and every new recruit helps us to build the network of mutual support.

Regretfully, we also face an increase in minimum insurance costs. Our insurance company confirms that micros have become a prime target for burglars! The rate is still 25p per £100 insured, but the minimum is now £10 p.a., with an excess of £25. This means that a school can include equipment up to a total value of £4,000. You are advised to insure additional items on initial application or at the renewal date, to avoid a £3 administration charge for changes during the 12 months of the policy.

MICRO-SCOPE

Peter Stevens' report in *MICRO-SCOPE* 10 and the comments in the editorial of that same issue were fully discussed at the next Council. Peter's very positive suggestion was that in order to attract good quality articles we ought to be prepared to pay up to £50 to contributors – the rate common for commercial magazines. This idea has been considered before: the problem is that in order to pay contributors we need extra income. We could achieve this in three ways. Raising the cost of *MICRO-SCOPE* would mean a higher annual subscription. Or we could begin to use *MICRO-SCOPE* as a vehicle for advertisers – very attractive for the advertisers but not so good for the readers trying to discover the articles in between the blocks of goodies on offer. A third way would be to attract sponsors willing to pay a certain sum per issue to purchase important lead-articles from people eminent in the field. Council on this occasion decided to maintain our independence, for the time being, with our 'home-made' brew of a magazine, written by members for members, sharing experiences gained in the classroom or in the home. There are many magazines on offer in every newsagent which bury the articles in the adverts, and these can prove very useful additional sources of information.

We offer a vehicle for news and views between the regions and between our members. Please send in those snippets of information which can prove of enormous interest to other readers. We need to tap news of ingenious uses and developments taking place in our classrooms. Thank you, Peter, for sending us the views of your group; there were some other very positive suggestions which we will be taking up in the future.

Regional Matters

Members were recently sent copies of the revised constitution. It is now two years since it was first created and at that time provision was made to review it in the light of the experience gained. The main change which has taken place – I began by referring to this Orwellian year as the year of change – has been to place greater emphasis on the regions. It is very important that members take an active interest in regional

events and try to establish networks in their own localities for mutual support. Sad to say, there are three regions which have yet to be represented on the Council and these gaps we hope to plug in the very near future.

Another change has been instigated in order to maintain some continuity within the executive. Instead of 'all change' at the Easter conference, the Council members (i.e. representatives from each of the 14 regions) will elect the executive committee at their first meeting following the AGM.

Some of the regions are extremely active. I mentioned in the last issue that I was looking forward to visiting the Scottish MAPE conference. Well, it was even more successful than I had hoped: a tremendous turn-out, and an atmosphere full of vitality. It was indeed a pleasure to be there and to share in that enthusiasm. The demonstrations, based on classroom case studies, were absolutely first class. I came away from the conference with my batteries fully recharged, a feeling shared by many of those fortunate enough to be able to secure a place at the conference. I am sure they would wish me to thank Russel Wills and his regional committee for the hard work they put into the venture. We all hope that it will become a regular event in the Scottish Education Calendar. I am now looking forward to enjoying a similar experience in March when I visit the conference being organised by the Northern region.

More Government aid needed

MAPE as an association is being asked to present the views of its members on various bodies; it is in this way that we can influence the direction to be taken by the new technology and its effects on the curriculum. For example, we are represented on the British Computer Society's Primary Schools Committee and that Committee has some very interesting work currently on the stocks. We are also represented on the CNAA Committee and our views have proved to be a source of interest which we hope will become influential.

Four members of MAPE's Council attended the ELCOT conference earlier this year, and an intensive thought-provoking week it turned out to be. We were asked by HMI and MEP to seek the 'way forward' and to make recommendations. Of the papers which will eventually emerge, at least three were co-ordinated by MAPE Council members. I can't give details here of the discussions which took place. Suffice to say that we strongly urged the Government for more help, through an extension scheme on the lines of the one currently being offered to secondary schools. This should include not only hardware (disc drive, printer, control technology kit) but also software in the form of open-based 'tool-boxes'. Details will emerge quite shortly once the various papers have been collated: perhaps we can devote some space in *MICRO-SCOPE* 12 to the recommendations made and to the many implications.

I hope that my plea in *MICRO-SCOPE* 10 for letters from classroom teachers informing us of their needs has not gone unheeded. This journal provides an excellent means of communication – use it!

Certainly, whenever I go into schools, I am struck with the growing need for more resources. I don't mean only microcomputers or even software: I mean there is a need for more support materials of the more traditional kind. This is certainly true especially in those schools which are using simulations as part of their project and topic work. It is this type of software which could open up vast horizons within the classroom if only the resources for 'lead-in' and 'follow-up' activities were available. Many of our library and video resources are proving inadequate to satisfy the growing needs of children who are becoming far more sophisticated in their research skills and in their need for additional information.

This situation must be proving to be a great source of comfort for the members of the Publishers' Association and I hope that their pressure on Government to put some funding into support materials and software is successful. It also has serious implications for MAPE in that we should now concentrate on providing members with the skills to discriminate between good and bad software, a very difficult task but not one to be shirked. Perhaps the publishers could be persuaded to support a national network of 'Try before Buy' libraries organised by LEAs so that teachers could review available software in a secure reference situation. This would avoid the dangers of piracy, and would help teachers to decide before spending their very limited capitation on software which does not necessarily live up to the clever wording of the professional marketing man.

MAPE TAPE 1

MAPE does not intend to become a software house – it must leave that to the professionals, but MAPE did venture into this jungle when it produced the first MAPE Tape. Despite having its fair share of teething problems this has proved very popular amongst members (except amongst Spectrum owners!). All the programs were very generously donated by members. This meant that the MAPE Tape could be presented as a free gift within last year's subscription.

If we are to repeat the offer with 'son of MAPE Tape' then we will need more gifts from members – hard to come by in these days of hard-headed commercialism. If the programs come in (send them to Roger Keeling c/o Newman College) then MAPE Tape 2 will be produced and distributed. By the way – I am sure that you would wish me to thank the Newman College team under Roger Keeling, the generous donors and Brian Richardson of CSH for the hard work they all put into producing and distributing the programs.

Now for those disgruntled Spectrum owners. We had to make a decision on the production and we followed the Government statistics on the proportions of computer systems which were being used in schools. We found that it was uneconomic to rewrite all the programs for the Spectrum; and no doubt owners of Vic 20, etc., would have been furious had we done so. However, we are willing to encourage any Spectrum owner or any other system owner to convert the programs – let us know once this has been achieved and we will pass on the information to other MAPE members having similar machines. Please remember, it was a free gift!

[Next time, we hope to offer an alternative package for Spectrum owners – Ed.]

MAPE Information Book 2

By means of a generous donation from IBM, work on a MAPE information booklet on 'Data-Handling in the Primary Classroom' is almost complete and will hopefully be distributed to members later this year. If we are to supply it within this year's subscription then we will need more sponsorship to cover printing and distribution costs, and this has yet to be negotiated. Still we are ever the optimists. Even if we have to make a small charge towards printing and distribution costs, I am sure that members will find the booklet of great interest and a mine of information.

Bookshelf

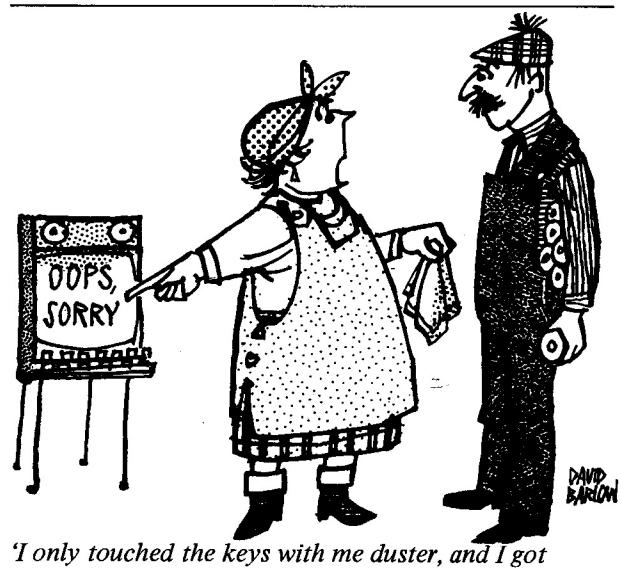
Although many books have recently been published within our sphere of interest, I have not been able to find the time necessary to read many of them. However, one that was easy to read was the long awaited Scholastic magazine, *Primary Teaching and Micros* (PTM). It appeared at the beginning of the year and has got off to a fairly light-hearted start. If it manages to penetrate staff rooms where no *Educational Computing* or even *MICRO-SCOPE* has yet been seen, then that can't be a bad thing.

A much heavier tome, dressed in yellow and black livery, arrived from Greater Manchester under the generic title of *Primary Contact*. It was Special Issue number 2 on Microcomputers, and it contains no fewer than 64 articles in its 277 pages. These range from articles examining the present and future of micros in primary schools to introducing and managing the micro, through to pre-computer activities, curriculum applications, simulations and adventure games, LOGO, electronic toys and robots – the whole gamut, and all for £4.75! The compendium of articles is available from R. Fairbrother at the Didsbury School of Education, Manchester Polytechnic, 799 Winslow Road, Manchester. The Editor is to be congratulated on accumulating so many articles in this comprehensive guide to the state of the art. I think this paragraph from his editorial is worth quoting, especially in view of Peter Stevens' comments mentioned earlier in MAPE matters.

'We are enormously indebted to our many contributors for their professional generosity. Some of our contributors were attempting their first item for publication. We would like to extend a personal thank you to each of our Authors on behalf of our readers. We would like also to acknowledge the many journals and publishers who responded equally generously when their permission was sought to reprint articles. *Perhaps in no other profession are those involved so willing to help each other.*' I hope that through *MICRO-SCOPE* we can help keep that 'willingness to help each other' alive, despite the fierce commercial pressures which now surround us.

End Piece

I began this column by mentioning change, perhaps I ought to also mention that if you have any general queries concerning MAPE you should send them to our new (temporary) secretary, Mrs E. G. Jones, at 76 Sudbrooke Holme Drive, Sudbrooke, Lincoln, LN2 3SF, Telephone 0522 754408.



'I only touched the keys with me duster, and I got a rude word!'

Brum into orbit?

Barry Wake
Primary Computing Support Team, BECC

> 'Thinking about the computer's role in education does not mean thinking about computers, it means thinking about education.' – Allan Ellis, quoted in the Micro Primer Reader, p. 38.

When the MEP announced its scheme to get microcomputers into primary schools, the LEAs must have been presented with one of their biggest in-service headaches ever. Here in Birmingham, the problem can be summarised in two parts:

a) How do you give two teachers from 350 primary schools the required two-day Micro Primer course?
b) And with what long-term support do you follow it?

In the event, any LEA's response will be partly determined by the 'nature of the beast'. Birmingham, educationally speaking, is a large but compact metropolitan area with a recent, if not too successful, tradition of a 'consortium system' throughout the city. It had already the thriving Birmingham Educational Computing Centre (BECC), based at the city's teacher centre at Bordesley. There was also an initial microcomputer project (involving five primary schools) co-ordinated by Colin Watkins, at that time the only Primary member of the BECC staff. In spite of its limitations, however, some valuable lessons were learnt from that initial scheme: in particular, the importance of reliable equipment and the length of time needed for teachers to produce good software.

The Primary Computing Support Team

In September 1982, nine Birmingham primary teachers had been seconded to local Colleges of Education (Newman and Westhill) for one-year full time diplomas in educational computing. Clearly, here was a possible source of manpower. The following year, in fact, saw the formation of the Primary Support Team, including seven of these nine teachers on a further year's secondment. Colin Watkins remained as Primary Co-ordinator and the Inspectorate provided a good deal of support.

The Team is based partly at BECC, to help run the DTI/Micro Primer Courses, and partly at the schools from which the members were originally seconded, for long-term support to local areas. Working in pairs, team members run a 3-day DTI course spread over two weeks for some 12 schools at a time, with 11 or so such courses per term. In this way, every single one of the 344 primary schools will have some in-service training and receive its micro well before the end of the school year 1983/4. What is more, having standardised on the RML 380Z for secondary and the 480Z for primary, Birmingham decided to pay the other half of the DTI package!

Quite early on, however, it was realised that more support than that available at BECC would be advisable and indeed necessary to bring about the effective use of micros in the primary curriculum. Even the 12-station 480Z Network at the Centre can't cope with over 3000 primary teachers! The plan was to establish some twenty 'mini-centres', known to us as 'Satellite Schools'.

The Satellite System

As it happened, 19 schools, scattered broadly if not exactly evenly throughout the LEA, were agreed upon as having the necessary expertise or experience, or indeed enthusiasm. To these was added BECC itself, which obviously already housed considerable equipment. Over and above the DTI package, the other Satellite schools were to receive a second complete 480Z system, a double-disc drive, an Epson printer, a trolley, and extra software. One member of the Primary Team would also be allocated to them to help and advise.

For their part, the Satellite schools entered a commitment to one 'Software Library Session' per week after school for local teachers to view programs, copy the non-copyright ones or discuss ideas and problems. They would also welcome visits from teachers during the school day, subject to prior arrangement, to see the computer in action in the classroom. With the help of the Primary Team member, they were also asked to act as the 'first line of defence' for any queries or problems. (When all else failed, they could always use the BECC primary answerphone which is monitored every day.)

The schools were given the brief of offering a service, of trying to show how the computer might be used as an aid to learning. The guiding principle was to be that of taking the computer to the children and not vice versa. In the words of one of the General Inspectors responsible for Primary Education, their aim was to become

centres of 'good computing practice':
'. . . exemplars of good, positive use of computers for learning and for creativity'.

A typical weekly programme for the members of the Primary Team consists of one day a week spent at their own school, two days at other schools in their area (or at other Satellites and their schools), and two days at BECC. But, of course, it does not need a computer to realise that with 344 schools, 20 Satellites and 9 Team members, the maths goes somewhat haywire! Some Satellites may have three areas to deal with, and by the end of the academic year each Team member will have some thirty to forty schools under his or her wing!

At the moment, we have just started Course Number 15 – the halfway stage. So far, reports suggest that things are going reasonably well, if somewhat slower than expected – the disc drives, for example, have only just arrived! Some Satellites are making great strides, staging mini Micro Primer courses and 'software think-tanks', whereas others seem to be marking time.

By Easter we shall be better able to take stock of Birmingham's Satellite system, and identify its strengths and weaknesses. We shall also be actively considering its future, especially after the present Primary Team completes its one-year programme and is disbanded. Watch this space in the next issue!

Attainment of a vision

Chris Robinson
Iver Heath Middle School

It started two years ago in October 1981 with three separate incidents that occurred almost simultaneously. First, I bought my own personal computer (a ZX81). I knew computers would be coming into schools and, worried by the thought that our curriculum might be dictated by software salesmen, I wanted to learn to do things with it myself. Secondly, I went on a one-day course organised by my LEA in which Roger Keeling opened my eyes to the computer's vast potential. Thirdly, our parents' association suggested they might buy a school computer. That's when I was first called in as an 'expert'(!)

In the month I had available to me, I first taught my 1K machine to do half-a-dozen simple mathematical tasks which might be loosely considered to be educational programs. (I still maintain that the constraints of the minute memory forced me into better programming than if I'd had more available to me!) I used the programs with my 10 and 11 year old maths set and was instantly 'hooked'. My demo and talk to the PTA was well received (probably because I had used the video equipment they had recently provided as a 'fly on the wall' in one of those maths lessons for them to view).

I was asked how I envisaged computer-assisted learning being managed within the school. I replied that eventually I would like to see a computer in each room networked to a 'library' computer – but would be quite happy with one to start with. It was prudent, however, to wait for a county recommendation and to see if the DoI might introduce a half-price offer for primary schools. The months that followed were frustrating. I acquired extra memory and programs from various sources, learning to discriminate between good and bad. I acquired one of the first Spectrums to be produced, for myself, and one for the school's by then thriving computer club.

When the DoI scheme was announced, I was dismayed to find that the county recommended the RML 480Z. It was a beautiful machine but we would never be able to afford more than two of them – and by then I'd learnt that one machine would not be enough. After convincing my county advisors I knew what I would do with them, I was permitted to order Spectrums.

Now, two years after that original extravagant vision, we are just awaiting the final phase to complete it. We have a computer (48K Spectrum), colour television and Sinclair printer in each of our six classrooms and a spare 'Library' computer and television (in addition to the previously-mentioned computer club's machine) provided by our PTA for less than £2000. Next month we hope to complete the network – and add microdrives (they're Sinclair's equivalent to discs) to each machine for a further £500.

Now we've got the equipment, what are we doing with it?

We have over 100 programs which have been used in Maths, English, Environmental Studies, RE and General Studies. We may have many CAL 'games' for Structured Reinforcement. Using a computer-aided design program, we have created images in three dimensions. We experience the advantage of word processing for improving our written creations. We create and interrogate databases. We drive turtles (on screen only at present) using LOGO. We make meaningful decisions with simulations. We communicate with 'penfriends' in another school via Prestel

links. We dabble with control – joining the computer to motors and lights. We keep records.

The other teachers are now becoming 'hooked', just as I was.

When we connect our school network, via the otherwise unused loudspeaker system that joins each room, we shall improve our communications facility and expand the computer's potential providing Information Terminals (e.g. we can call up a library disc to find what resources are available to assist in projects, and load a relevant program instantly without having to go trudging off looking for it.)

However, I hope readers don't get the impression that we use computers indiscriminately for the sake of it. We always put the educational needs of our children first but whenever computers are found to be useful to supplement other methods or resources, we exploit the new technology to the full.

They are not all in use all the time, though there are times when every class is using one, and it is possible to have more than one computer running in one class at a time. I have once had nine computers running at the same time with a class. Although it's not something I expect to repeat often (I normally use one with one group), it can prove beneficial for some applications and our machines are portable enough to be taken to any classroom if wanted.

Walsall LOGO project

Linda Spear
Primary Support Team, Walsall

The Walsall LOGO Project began at the start of the Spring Term, January 1984. It is essentially a small project, for two reasons: it enables the six schools involved to be adequately resourced, and also to interact above a superficial level. The project is guided throughout the whole period by members of the Primary Curriculum Support Team, principally through Julian Pixton. (NB: members of this team are seconded teachers from schools, who aid curriculum developments in the Authority.) We wanted to evaluate the relevance of the LOGO philosophy, as outlined by its creator Seymour Papert, for the whole school-age range. We already regard LOGO as an excellent example of an interactive programming language for children, but had found no guide-lines available that allowed children from 5–18 years to explore its potential in school.

There are three phases in the project:
1. Bigtrak; 2. Turtle graphics (BBC); 3. LOGO (Atari). We have already placed Bigtrak in the Infant and Lower Junior age range to promote an attitude that is conducive to learning with LOGO. The emphasis is on discovery learning with simple materials that the children can make for themselves. Overlapping is phase 2, which is turtle graphics. This is implemented on an EPROM for the BBC micro. We are extremely fortunate to have this version written by Julian Pixton as it is 'tailor-made' for our requirements. It runs both the Jessop Turtle and the BBC Buggy, and has a built-in screen dump. It offers full recursion and an unlimited number of variables, and work can easily be saved and loaded through a fast cassette interface.

The error messages are extremely friendly, which is important for young children, and the documentation is clear and helpful. The syntax is compatible with the full LOGO implementation chosen. Atari LOGO is phase 3 and has been chosen because it leads on from the BBC turtle graphics to Multiple Turtles. It is the most complete version at a reasonable price and has excellent list handling capabilities. Phases 2 and 3 overlap and extend over the middle and secondary school age ranges.

A policy statement has been drafted for every school in the project. It outlines the aims, philosophy, choice of hardware/software, time factor, and how the project was set up. It provides for evaluation in school with salient questioning on classroom organisation, teacher and pupil strategy and the project organisation. As the project is fairly intimate, the relationships between the schools are flourishing with regular workshops to familiarise staff with the material and working parties to review resources. We believe that, by maintaining close contact and sharing expertise, it is not only the children who have the opportunity to grow and change, but we, as teachers, will also be able to participate in this change.

Certainly the enthusiasm and response so far have indicated that LOGO has much to offer in many fields of communication. We anticipated high interest from the children but it is in every way matched by the positive and enthusiastic attitude of the staff. Most have little or no experience of the computer but have to their credit willingly placed themselves as learners in the project. We would not, of course, have been able to have initiated this project without the generous support and keen interest of our Local Education Authority, who are encouraging and assisting us. We hope to have an interim report at Easter, dealing with the beginnings of the project and any significant learning areas that might have been developed.

Micros and primary education: a parent's view

Dr P. Seymour
Cheltenham

1. I should like to take up several points from *MICRO-SCOPE* 10.

2. First, the cost of software. It is generally far too expensive. A few programs and projects may well have been the work of several people over several months, but most are not. Earlier this year I produced a set of matching programs (colour, shape, size, number, number-symbol) for our local primary school. These are not dissimilar to the MAPE *COUNT* program and I doubt if I spent more than 40 hours on the whole set.

3. Next, copying. This is generally the result of the high price of software. The industry needs to learn the lessons of the singles record industry in the late sixties, although it may already be too late. Once it has become socially acceptable to copy software few people will feel inhibited from doing so even if prices do come down.

4. The MEP package and parents. Pirate copies of the BBC version already exist so please let's get it onto the market officially, at a reasonable price, and at least make some money out of it to plough back into software development.

Reg Eyre asked about possible problems caused by having children in a class who have already covered the work at home. This is not a new problem. 33 years ago my mum was ticked off for complicating my first teacher's life by teaching me to read pre-school. This kind of problem still exists and will continue to exist so long as parents continue to buy books, software and other educational materials. I wonder what teachers in the middle ages said about the introduction of books to the home! I do appreciate the problems of teaching 30 children with different abilities and backgrounds who, ideally, ought all to be doing different things. The answer however is not to stand there Canute-like telling parents not to teach their children or buy educational materials, but to point out the problems to parents and then demand more resources from them in terms of money, goods and manpower to enable teachers to cope in the classroom. Remember, every class starts off with 1 teacher, 30 children and nearly 60 teaching assistants! Also, the majority of parents spend much more than the £4 per year capitation on education materials for the home.

5. Reg Eyre also asked whether the child with a computer at home has any educational advantages over one who hasn't. The simple answer to that must be yes. My 6-year-old twins, having played with both LOGO and *MANGONEL*, have a passable understanding of angles expressed in degrees. By the time they do that officially at school (at the age of 8 or 9) it will be old hat and they will have moved on mathematically to something more complicated.

I very strongly agree with Graham Bickerton when he argues that children can learn things normally reserved for much older children if they are taught in the right way. Micros can provide just the right facilities for learning and are being put not only into schools but also into the hands of parents. Inevitably it is the parents whose children are already advantaged who will be buying the micros and using them to help their children's education. In areas such as mathematics, where extra facilities and individual tuition can make an enormous difference, the effect of home micros on those children could be quite dramatic.

6. Reg Eyre also asked if this was acceptable. Of course it isn't. So what are we going to do about it? In the long term, as with books, the answer must be mass production, low prices and communal facilities. It won't solve everything. 500 years after Caxton there are still more books for the children of Esher than for the children of Toxteth – but at least all children have access to a reasonable number of books through schools and public libraries.

7. That, however, is the long term solution. What can be done in the meantime? I would like to suggest the following ideas:

a) Keep up the pressure on central government for more money for hardware.
b) Demonstrate the benefits of micros to parents – then pass round the hat – frequently.
c) Make parents with home micros feel thoroughly guilty about the unfair advantage they giving their children. Pass the hat to them more often!
d) Assure parents that a micro is not a particularly delicate object and that it probably won't come to any harm if their children's friends are allowed to play with it too. After a year's hammering by some 20 of our local children (ages 3–11) the only problem for our Beeb has been that the space bar has needed tightening.
e) Get parents involved with after-school micro clubs, each bringing an extra micro with

him/her, of course, Damage insurance is relatively cheap (about £10 per year). Perhaps the PTA could pay for this if the micro is not already insured.

f) Get parents to write software. Often a school has at least one professional or semi-professional programmer among its parents who could be coerced into writing a free program or two. If each of 27,000 primary schools contributed one free program . . . wow!
I have thrown about a dozen programs into Cheltenham Teachers' Centre and am trying to persuade other computer-oriented parents to do likewise. These are all free programs, written locally and used in local schools. I am hopeful that we will be able to arrange swaps with other centres who also have free copiable software.

8. What about the programs? I don't know what the official split is, but here's mine.

a) Drill and practice – very easy to write, ideal for the amateur but needs educational guidance. Could I suggest at this point that the complexity of the graphics should be proportional to the number of times a child is expected to run the program and inversely proportional to the age of the child? Thus *XWORDSPELL* (a spelling program, to be run many times and aimed at 6–8 year olds) comes complete with police sirens and rockets taking off, while *COLOURFIND* (a matching program for 3–4 year olds which should be run no more than a few times by each child) contents itself with a little man running across the screen.

b) Games – need inspiration but often easy to write.

c) Visual aids – so far hardly touched but potentially a very powerful tool, particularly for teaching mathematics and technology. These programs need to be written in co-operation with the teacher who is going to use them, as the main advantage here is that programs can be made teacher-interactive. Good professional-standard software is needed but please leave out the anti-LIST devices. It does not prevent copying. It does make customising harder and this type of program does need to be customised. Teachers modify written material using correcting fluid and red ink, so why not software?

d) Simulation exercises and projects, like *Mary Rose*, and adventure games – strictly for those who know what they are doing, i.e. experienced programmers in cooperation with experienced teachers.

9. More on software. I was a little perturbed to read Senga Whiteman's comment on software companies who asked what teachers wanted in the way of software. Any teacher with an idea should either write the program or get someone else to do it. 'Not telling' will not advance the cause of educational software.

Editor's note

We are delighted to receive such a considered and interesting letter from a parent who is clearly committed both to education and to new technology. We hope it will stir readers to a lively response. Meanwhile, we offer a few comments.

There is little shortage of simple drill and practice programs. But many teachers would welcome even simple programs on a concept-forming use of matching, written to their own specifications.

A greater need is for the sophisticated programs that result from several months of teamwork. Publishers point to the high development costs and small print runs – hence, high prices.

Micro Primer is available from: Tecmedia Ltd., 5 Granby St, Loughborough, Leicestershire, LE11 3DU, at £17.97 per pack (4 packs).

Letters

Dear Editor,
I am an Australian primary school teacher visiting the UK, and am writing in the hope of setting up some kind of correspondence between the two countries.

My brief when I set out had three elements:
1. to discover whether there were any publications, be they national, county, or private, which would provide us with ongoing information and to which we could subscribe;
2. to attempt to trace any groups of individuals who have been in a position to evaluate existing software and make recommendations to those without ready access to the material;
3. to find out whether there are any groups of teachers in UK who, like us, are producing their own material and would be interested in sharing and exchanging programs.

I would be most grateful for any information you may have in the above areas, and look forward to hearing from you on my return to Australia.

Angela Weeks
323 Angas Street
Adelaide SA5000
Australia

Sinclair debate (continued)

Dear MAPE/*MICRO-SCOPE*,
In support of Chris Robinson of Iver Heath County Middle School (*MICRO-SCOPE* 10), I am writing to express my concern at your prejudice against the Sinclair Spectrum in producing your MAPE Tape for only the other two machines. Having recommended MAPE to many of the schools for which I am responsible, I have had considerable comeback from members complaining that the tape and many articles in *MICRO-SCOPE* ignore the Spectrum.

It can be reasonably expected that, after the initial purchase of a DTI machine, most schools will be seeking to purchase more machines. We pay £380 for a 48K colour set-up (microdrive, networking interface, cassette recorder, printer, console, TV included). It seems unrealistic to consider any other machine.

Please note also that DTI orders in Scotland are as follows: BBC 60%, Spectrum 40%. When you further realise that some of the 'BBC' schools also have a couple of Spectrums, the balance quickly tips towards Spectrum.

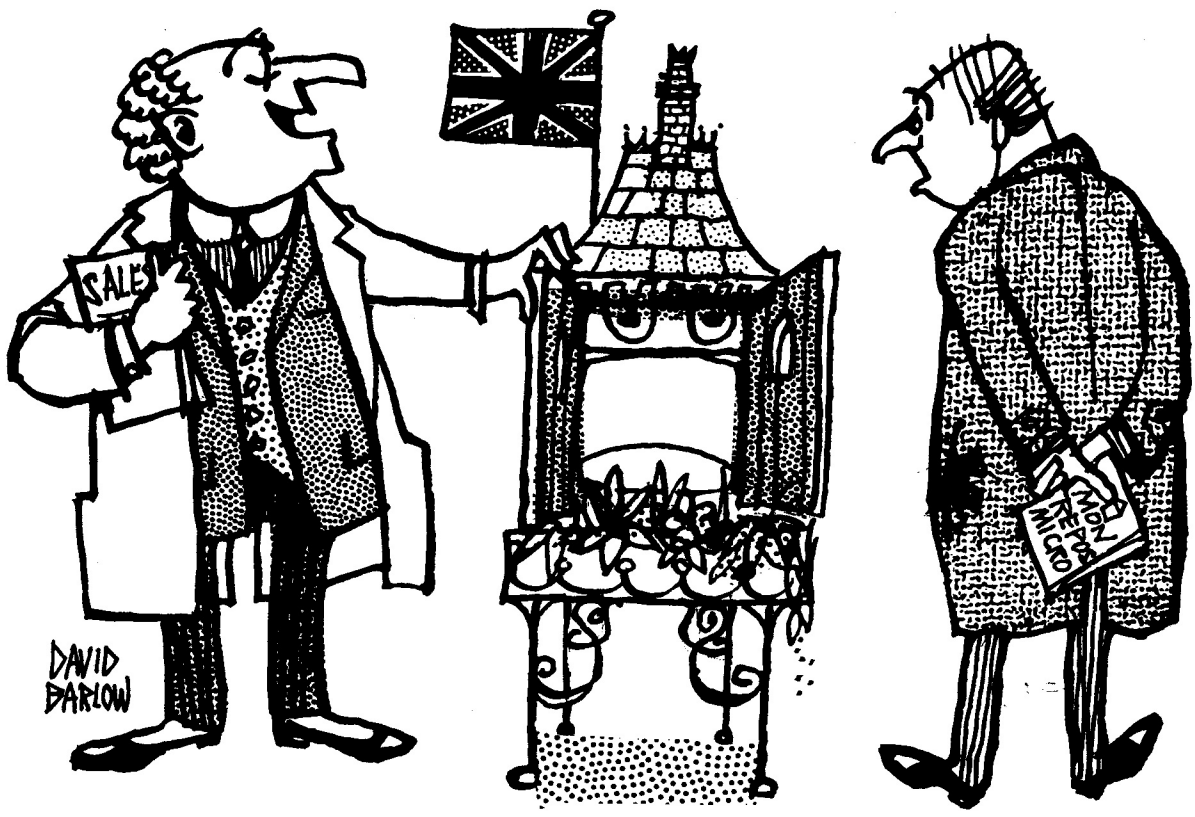
Thankfully, commercial publishers know this and are producing programs for all three. (Do I notice the 480Z receding ?) It is also gratifying to note that, owing to available memory, Spectrum versions are sometimes fuller (e.g. Heinemann's Dudley Programs). The Spectrum can offer better graphics (e.g. BBC radio *Using Your Computer*), cheaper software (Griffin & George, Stell, etc.) and even full implementations of LOGO and PROLOG – both free to primary schools).

I hope MAPE is not going to become purely a BBC users' club. (Like MEP, if the quality of the DTI programs written for Spectrum is anything to go by.) I also hope that *MICRO-SCOPE* and the Easter conference are not going to fall into the trap of believing that '3 out of every 4 computers going into schools are BBC' (The Advertising Standards Authority recently upheld a complaint against this lie.)

Senga Whiteman will no doubt be able to sympathise with the Spectrum position when she compares it to the attitude to women (*MICRO-SCOPE* 10, p. 32) – i.e., often superior to the opposition but grossly underrated!

It is about time the imbalance was righted. Let's hope MAPE rises to the challenge – without quoting DTI figures as a stock answer.

Dugald F. Campbell
(Computer/Curriculum Development Officer, GEM Project, Grampian Regional Council)



'You just can't beat good traditional British know-how!'

Software and the curriculum

Ron Gatfield

There are obviously a number of ways in which software may be classified, but the four categories recognised in the MEP Primer Pack are as valid and as useful as any. Some thousands of schools have now received their micros under the DoI scheme. As we approach the end of the first year of this very rapid innovation in our schools, no doubt many of us are pausing to reflect and to consider the way forward in the immediate future.

1. Computer Aided Learning

It was not surprising that the earliest ventures into the use of micros in schools produced programs that were merely translations of standard classroom practice on to the VDU screen. To say 'merely' is not to belittle such programs for they had, and indeed still have some very strong points going for them, especially for the comparative newcomer to micro computer use.

(a) The 'standard practice' was recognised and could be readily accepted by the beginner.
(b) There were no problems of integration into the curriculum since the programs stemmed from it.
(c) Even the less interesting routines quickly demonstrated to teachers an apparently high motivating characteristic when children were working with these interactive machines.
(d) Teachers quickly observed the high level of discussion between children working in small groups. The positive benefits to language development were perhaps unexpected but are nevertheless real.
(e) Since the program structures were generally quite simple, it took little extra training to enable class teachers to 'get into' the programs and amend words and/or data lines to make the program fit more realistically into current work or to suit particular children within their classes.

The arrival of commercial educational software in significant quantity presented a different picture. The professional programmer introduced a much more sophisticated and, in many cases, much more attractive looking program. The program structure was complex. We have a 'take it or leave it' situation since amendment is beyond the majority of the elementary programmers among teaching staff. One understands the difficulty of copyright but many programs are used because they have been purchased and though they may not be a good 'fit' in terms of the work of a particular class, there is a reluctance to discard. Without a preview facility this is bound to happen but a more recent trend in commercial software presents an acceptable compromise. Increasingly, programs start with a number of 'Teacher Options', which allow the class teacher to set some of the parameters of the program: the maximum number, the response time, the level of sound, the level of the vocabulary employed, etc.

This is a most welcome trend and hopefully it is a characteristic of programs that teachers will look for when making selections from the commercial software market.

2. Simulation programs

These programs, unlike CAL, introduce something that is completely new. They provide experiences for children that cannot be provided in the classroom by other means. One accepts that these are difficult programs to construct and that themes that are at the same time sufficiently realistic, as well as valid in terms of the primary school, are not easily conceived. The number available continues to grow and it is some of these programs that are exciting the interest of the newcoming. The program *LOCKS*, from the Newman College/MAPE Tape, is a good example. How else can children get the experience of actually controlling a lock system except under rare circumstances and away from the class, and so be led into the associated work be it project, history, or geography?

Generally the simulation program follows the real life cycle of: observe information . . . assess its relevance . . . relate to current situation . . . make appropriate decisions, which may involve co-operation with others . . . observe the effects of these decisions . . . reassess the situation . . . hold some kind of inquest or discussion whether internal or with others . . . restart the cycle. A high degree of mental activity may be involved and if the program is a group activity then a great deal of language use and development is produced also.

3. Problem-solving programs

Without a doubt, the prospectus of most primary schools, whether in print or understood, contains words such as 'We aim to teach the children to think in a logical manner'. To say how this is normally achieved would be difficult, to say the

least. Now we have at our disposal a machine that depends upon logic for its function. A task set on the microcomputer, if successfully achieved, invariably involves logical sequences of instructions and logical thinking, even if some trial and error attempts have been used en route. The obvious example is the LOGO language or at least one of the many subsets of it currently available. For the school this is a whole new approach, a new way of thinking which holds out great promise.

The other important point is that such programs can be 'content free'. They make no direct demand upon the child. They do not control the child and what he/she does. The child is in control of the machine and what the machine can do or produce. Justification for the introduction of LOGO into our schools has been published widely. Its possibilities and the interesting work generated appeal to teachers and children alike.

4. Information handling programs

This is a rapidly expanding group of programs that in many ways is the most exciting of all. The file creation programs and information retrieval programs, together with the idea of a word processor for school use, offer perhaps the most exciting of the many challenges to the school of the immediate future. That we are already well into the information technology era is certain. Life in the future will demand a whole new set of skills to take advantage of this new technology. We have yet to identify all these skills to ensure they are part of our future educational approach for even the youngest children.

The general approach to information in schools at present, the way it is sought and collected, its classification, its storage (currently by an overemphasis on writing), its retrieval (mainly from written records) – all need to be brought up to date with the technology now available. The elementary data processing program demands a level of skill in categorising, in asking distinguishing questions, and in using very precise language both in statement and in interrogation, that our current approach does not really generate. The sheer amount of information soon to be available to school children via electronic filing systems demands some rethinking. In itself, the information handling or data processing program is again 'content free'. It offers the opportunity to work in whatever information area the child feels necessary – yet, using a retrieval system, their queries can be as specific about file contents as they can make them. A new range of opportunities presents itself for language development and for all kinds of creative work.

The curriculum and the future

Some thousands of primary schools have now had their microcomputer for long enough to get beyond the 'general familiarisation' phase and to start to think about its integration into the curriculum. CAL programs, so closely allied to familiar classroom practice, are most readily assimilated. Though software supplies are increasing all the time, we still are only able to offer pin-pricks along the continuum of the curriculum. It may well be that we do not want thousands more programs to fill our catalogues and software libraries. Vast numbers would bring problems of recalling what is available and of selection. No doubt CAL programs will continue to improve in quality, as they have certainly done over the last few years. Perhaps what we need is not a rash of programs that deal with yet more isolated skill practices or simple concepts, but suites of well-designed programs that will cater for a substantial section of the curriculum, freeing teachers to concentrate on other sections where their teaching skills are indispensible. The fact remains, CAL programs do support the existing curriculum to a greater or lesser extent and will continue to do so in future.

Simulation programs that offer experiences in areas already covered by the curriculum are also readily assimilated and accepted by the schools. They can add fresh interest to studies, increase the experience of the child, widen horizons and also provide the central theme for much project work. The program *Mary Rose* is a very good example. It is not difficult to see that future programs of this quality, dealing with concepts and experiences outside the current curriculum, could stimulate changes and bring about curriculum development.

The structured thinking of the problem solving programs and the new skills that will need to develop in the use of data processing techniques and programs, though they may be brought into use with current work, point clearly to new curriculum opportunities and to new educational approaches. Data processing programs and database work in general go beyond the current curriculum in their potential and point to interesting new possibilities. For this reason, perhaps, they are finding acceptance in the classroom more difficult. The concept and the potential is as new to teachers as to the children.

There are clear implications for those concerned with In-service Training. The need for introductory courses will continue for some time yet. Many schools have now had their micros long enough to be looking for 'second stage' courses and further retraining. It would seem that involvement with LOGO and/or similar programs will be fairly readily accepted

and the amount of training involved is not great. The ideas behind data processing and the techniques involved, the potential in terms of curriculum change and the effect of information storage and retrieval on subjects right across the school curriculum – these point to a whole new area of retraining and an area of some magnitude. We shall need to think of this retraining for as many teachers as we are currently for introductory courses. The speed of developments is such that we cannot sit back and wait until the need is felt desperately. Those responsible for current In-service Training may not themselves be as well versed in this new field as they might wish and the need to train the trainers arises again.

The tasks may be daunting . . . but the opportunities and prospects are indeed exciting. In our concern to integrate the microtechnology into our current curriculum and bring its benefits to present work, we must not neglect to give adequate thought to the future. That micros can aid us with what we currently do is questioned less and less. We must pay due regard to the potential they offer in some fields to do a great deal more that is in keeping with the times in the real world outside the school, and which looks to our children's future.

What an adventure!

Richard Margetts

That's not the way some primary teachers would describe computing, but I would like to share a few thoughts on adventure games.

Some time ago I acquired (actually, I bought it!!!) a copy of *Magic Adventure,* a program sold by Kansas City Software for £8.50.[1] I have shown and used it widely and it seems to me to be an ideal primary program. It's nice, there are no dragons or ogres or witches; instead there is a fairy, a mummy rabbit who can't count her family, a talking tree, etc. etc. It's just short enough to enable bright juniors to cope with the logic and it has some pictures and sound. My only complaint is that the end might have been a bit more colourful.

The program has been used by teachers on in-service days. I have given it to top juniors who spent an afternoon with it and then the next day one of them wrote out an almost perfect account of the way through the adventure. I thought that was pretty good. And you should have heard the discussion that afternoon.

My experience with *Magic Adventure* set me thinking. What about other such programs and how might we exploit the idea? I have found two similar programs:

1. *SPACEX* is from 4MAT Software at £10 and is about the same difficulty level as *MADV.* It concerns some travellers on a planet who have to retrieve pieces of their spacecraft stolen by inquisitive aliens.
2. *Granny's Garden,* also from 4MAT at £10/£12 is slightly longer. It involves some logic puzzles.[2]

I believe both of these could find a use in primary schools, but I am not a primary teacher.

How could we expand the ideas? It seems to me there are many possibilities. What about a Geography adventure up the Amazon River, or a History adventure set in the days of Henry VIII? You can extend the list endlessly. Whoever is going to write the program will find two books useful:

1. Ian Watt has written *Creating Adventure Programs on the BBC Micro,* published by Addison Wesley. At £6.95 it is not cheap for its 128 pages, but it is good. It gives a detailed description of a sample game and includes the listing of others. ISBN 0 201 14678 9.
2. Rather simpler and cheaper is *Write Your Own Adventure Games* in the Usborne Series. Written by Jenny Tyler and Les Howarth, it sells at £1.95. A copy has only just arrived so it is too early to comment but it looks interesting. Since it is not just for the BBC micro the BASIC is a little less sophisticated.

I have an idea buzzing in my head for an Old Testament adventure. Perhaps one day I'll find time to write it!

1. Kansas City Systems, Unit 3, Sutton Spring Wood, Chesterfield. 0246 85935.
2. 4MAT Software, Linden Lea, Rock Park, Barnstable, Devon EX32 9AQ.

Software review: The Mr T Series

Good Housekeeping programs, published by Ebury Software (£12.95 each)
Cassette version for BBC Model B, Operating System 1.0 or higher. Also available for the Sinclair ZX Spectrum.

The *Mr T* series of programs has been designed for home use. Each cassette is accompanied by a Parents' Handbook. They arrive together in a well-designed package which will provide permanent storage.

The programs have certain features in common. When there are several options within a program the required activity is chosen via a Menu Screen display. This is accessed by pressing the ESCAPE key. Real control is obtained via the Parent Screen display. This is accessed from the Menu by pressing ESCAPE once again.

The following factors may be altered through the Parent Screen:
(1) the level of difficulty – this usually speeds up the rate at which problems are posed;
(2) whether the level of difficulty remains constant as set, or increases as time is spent on an activity;
(3) whether the sound is on or off;
(4) whether the program is being viewed on a colour or a black and white monitor.

The Parents' Handbook describes how to load the programs, how the programs operate and the various activities incorporated into each program. It offers some suggestions for additional, related activities for which a computer is not required. Throughout the Handbook the parent is prompted as to what he/she should say or do as parent and child work (although the emphasis is on 'play'), through the activities.

The programs have actually been written by two different software houses (Five Ways and Systems Software). The screen display and presentation are relatively constant but the loading process differs. In the Five Ways programs (asterisked below), the computer beeps as various sub-programs are chained in and the screen display shows something along these lines:

```
Loading
NMC1  02 02A9  beep
Searching

Loading
NMC2  08 08FO  beep

Loading
```

This is followed by a screen display of credits. When the title screen finally appears the loading details are sandwiched in and it is all to easy to miss any loading error. The Parents' Handbook glosses over the stages involved in loading. There is no advice about what to do if something goes wrong. If the programs are designed to be used by a parent with little or no microcomputing experience then more details would help. In contrast, when loading the System programs the title screen appears relatively quickly, the user is not aware of the loading process, and a decrementing number, displayed on the screen, indicates that the program is loading satisfactorily. I tried hard to get a loading error and, after resorting to fairly artificial means, discovered that the message 'Error – rewind tape' appeared. Loading the System programs was a much smoother and more friendly process than loading the others.

I mentioned earlier that the programs have been designed for home use. This is important because it has affected the way they operate. There is no help built in to a program. The child may get something wrong repeatedly and just be left sitting there, stuck. It is assumed that a parent will be with the child and if the child makes a mistake the screen is frozen to give parent and child an opportunity for discussion. If these programs are used in the classroom and there is no adult in constant attendance at the computer then some provision would have to be made for the child who needed help.

Those are general points: I'll now describe, in more detail, the specific packages.

*Mr T's Number Games

This package is subdivided into *How Many* and *Elephant Game. How Many* is designed to give the user experience in counting up to 9 and writing the numbers 1 to 9. The child actually moves the spots from a ladybird onto a leaf. One press of the spacebar moves all the spots onto the leaf, then one single press moves one spot back onto the ladybird. When all the spots have been moved back onto the ladybird the appropriate number is displayed and then written. Successful attempts are rewarded by the ladybird walking off the screen (You could have a useful discussion about how well a ladybird would move if its legs really worked the way they do on the screen!) There is a lovely little ladybird game when the spots have to be counted and the correct number key pressed.

The *Elephant Game* program has two activities – *Number Elephant* and *Elephant Dice*. The elephant needs to have his supplies, of buns and water, replenished as he either eats or drinks. One child is in charge of water, one child is in charge of buns. A number appears on the screen and the child must press the bun key that number of times, (or the water key, whichever the elephant is most in need of). It's not much fun, the computer responds very slowly to key presses because there are so many things happening on the screen. *Elephant Dice* runs along similar lines to *Number Elephant* but instead of digits being displayed on the screen a number of shapes or dots, in various patterns, appears and must be matched to a number key.

Mr T's Number Games offer a mixed bag. The activities offered by *How Many* present experience in a well-designed and interesting way. *Elephant Game* does not have the same potential.

Mr T's Money Box

This is divided into *Money Match* (four games in which coin outlines are matched) and *Money Box* (a game in which coin values matter – the child has to find coins worth more, or less, than those Mr T has).

I can see absolutely no reason why a parent who is prepared to teach his/her child about coins should buy this program. This program seems to offer less than the physical activity with real coins would, given the same parental commitment to discussion.

*Mr T's Measuring Games

This includes *Growing Races* and *Climbing and Growing*. In *Growing Races* the child has to match one shape with another. The computer is, however, used to its best advantage: the shapes to be matched grow and/or move. There are nine levels of difficulty. The shape to be matched and the growing shape line up in differing ways according to the level of difficulty. The shape may grow upwards, downwards, to the left or to the right. The growing rate may not be constant for each shape. The most difficult activity offers one shape increasing in size while the other shape decreases in size. Deciding when both shapes are identical is almost impossible. The idea behind the program seems very good; the programming falls down because the shapes are not always accurately matched in their fine detail as they grow and change.

Climbing and Growing requires creatures to be fitted onto a staircase. They may be made taller or shorter and/or be moved to a higher or a lower step. Out of all the Mr T programs the *Measuring Games* seem to have the most to offer. They provide a different, interesting way for the child to gain experience.

*Mr T's Alphabet Games

These consist of *Let's Draw Letters* and *Mr T's Letter Factory*. *Let's Draw Letters* does what the name suggests; it displays letters and their formation, on the screen. Apart from the strangely flashing drawing point there is little to note about this program. *Mr T's Letter Factory* is a game. The child has to match letters as they fall with a letter displayed on the right of the screen. The animation and visual effects are appealing, the sound effects are just too much. Overall, the letter formation can often be disputed. There is an inconsistency between the '*y*' they teach and the 'y' used in the game. It is a moderately well-designed and presented letter formation activity. The Parents' Handbook does suggest teaching the letter name – but I'm not getting drawn into that hornet's nest!

Mr T Tells the Time

This package is made up of *Clock Numbers, O'Clock, Working Clock* and *Matching Hours*. *Working Clock* is a straightforward demonstration of a clock. The hands are not particularly clear and for some reason the clock tick-tocks three times to the hour. *Matching Hours* offers 3 levels of matching the hands on two clocks. Two activities involve hours only, the third includes hands pointing to half and quarter hours.

Clock numbers involves the child in putting some missing numbers on the clock face: in clock sequence, in random order and, finally, with all the numbers missing. *O'Clock* offers a working clock with the addition of the written time, e.g. 1 o'clock. There are two games, involving matching the written time to that shown on the hands, and vice versa. When Mr T tells the time and the clock chimes, the colour of the face changes on each chime. I found twelve o'clock hard to take! This package offers a range of fairly routine activities with nothing special to commend them.

One final point – it is possible, as already described, to turn the sound off. You may have all or nothing. The range of sounds incorporated into any one program is amazing: every little action is accompanied by a sound. A child may reach a point where sound no longer indicates anything, it is just noise. These programs, with the sound on, are likely to hasten that process. In a similar way, we all know that the BBC Model B offers flashing colours but we might not need quite the number of demonstrations offered by the *Mr T* series of programs.

Senga Whiteman
Newman College

How to change BRICKUP to a spelling program

BRICKUP is a popular program in the Micro Primer pack. Tom Walsh, of Walsall EDC, shows how you can use the framework and motivation and yet adapt the educational content according to your own needs.

Children so much enjoy shooting their way through the bricks in *BRICKUP* that I felt it would be a good idea to adapt the program to other uses.

I thought that a spelling program would be a good idea, as there would be room for eighty words. I decided to allow the child to see the word for a preset time before it is rubbed out and they try to spell it themselves. The existing program would handle 'near misses'.

After a trial run of the adapted program it was found that children were so excited at hitting a brick that they did not notice the next word. So a further bit of programming allows the child to press the space bar to see the word again.

Program to alter BBC BRICKUP to SPELLUP

```
316Ø DEFPROClapse
3162 CLS:PROCCENTRE("FOR HOW MANY
     SECONDS DO YOU",8,1)
3164 PROCCENTRE ("WANT TO SEE THE
     WORD?", 11,1)
3166 PROCCENTRE("ENTER A NUMBER",
     14,1)
3168 PROCCENTRE("",17,Ø):VDU8,8
317Ø PROCINPT(Ø,2,1)
3172 LET T=VAL(A$):CLS
3174 ENDPROC
82   PROClapse
4ØØ1 P.'TAB(15)Q$(Q)
4ØØ2 PROCpause(T)
4ØØ3 CLS
4ØØ4 P.""ANSWER?";
4ØØ6 PROCINPT(1,11,Ø)
4ØØ8 PRINT'
4Ø1Ø RETURN
4Ø11 DEFPROCpause(T):T=T*1ØØ+TIME:
     REPEAT UNTIL TIME>T
     :ENDPROC
3Ø3Ø P."Look carefully at the WORD which
     you"
3Ø4Ø P."are given – It will then vanish."
```

Alter DATA LINES as follows:

```
6ØØØ big, big
6ØØ1 little, little
```

etc., up to 6Ø79 (80 words).

To allow the child to peep at the word again by pressing the space bar INSERT the following in line number 5Ø just before the word PROCZERO:

```
5Ø      :peep = Ø: look=Ø
```

CHANGE line 4ØØ1 to read

```
4ØØ1 P.'TAB(15)Q$(Q):PEEP=1
```

and ADD the following lines to the program:

```
4ØØ1 peep=1
4ØØ7 IF look=1 THEN look=Ø:CLS:GOTO 4ØØ1
4ØØ9 look=Ø:peep=Ø
3Ø42 PRINT "Press the space to see the word
     again"
3352 If peep=1 AND B-32 THEN look-1:GOTO
     361Ø
2Ø11 PROCCENTRE ("YOUR SCHOOL",
     2,1)
2Ø12 PROCCENTRE ("OWN TITLE",5,1)
```

Notes

Lines 316Ø–3174 and 82: This allows you to set the number of seconds for which you want the word to be displayed.

Lines 4ØØ1–4Ø1Ø: prints the word to be spelled, pauses for the preset time, rubs out the word and allows the child to type in a spelling attempt.

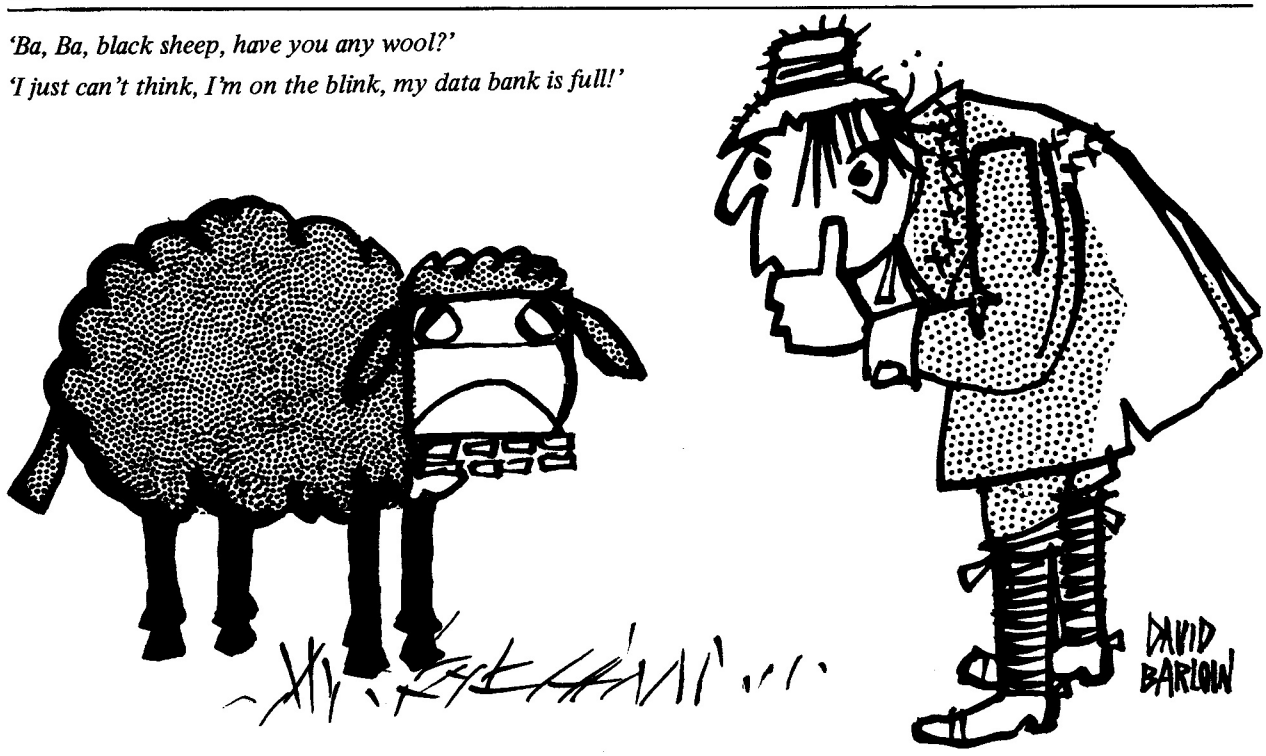
Line 4Ø11: allows a pause in seconds.

Lines 3Ø3Ø–3Ø4Ø: adds an extra instruction at the beginning of the program.

Lines 6ØØØ–6Ø79: These are the DATA lines of the words to be tested. Note that each word should be typed twice on each line. If you think that you can find a way of avoiding this in less time than it takes to type each word twice and still have a program that works, then that's up to you!

The remainder of the program's lines allow the child to have another look at the word. You can also add your own school's name and title with lines 2Ø11 and 2Ø12.

'Ba, Ba, black sheep, have you any wool?'
'I just can't think, I'm on the blink, my data bank is full!'



Book reviews

The Microcomputer in the Primary School
A. J. Obrist (Hodder & Stoughton, 1983, £3.95 – paper, 89 pp.)

The Microcomputer in the Primary School makes up for its lack of depth by making its explanations and metaphors very clear. It sets out to reassure the novice user of the micro in the primary school, and accomplishes this task well.

The opening chapters concern themselves with the micro and the teacher and the micro in the home. The different parts of the machine are related to already-familiar objects: keyboard to typewriter, VDU to TV, arithmetic unit to calculator and computer stores to cassettes.

The chapter on 'The Computer in the School' discusses basic organisation and makes suggestions for the introduction of the machine. An appendix extends this theme usefully. However, it tends to skate over the problems of instituting change in teaching.

I have reservations about some of the material on applications. 'Drill and Practice' programs are dealt with in detail – but then in the same chapter is a discussion of the use of Turtles, Bigtrak and the Buggy. These two uses do not seem to be compatible since they are a quantum leap apart in complexity and philosophy. Again, in the chapter on games, the author coins a subheading of 'guessing games' and includes *Farmer* in this category. There seems to be a conflict here since, as Mr Obrist points out, *Farmer* demands reasoning, and guessing and reasoning do not seem to be related to any great extent.

Later chapters examine word processing and information retrieval, but in this again a certain amount of ambivalence creeps in. Are quizzes a part of information retrieval, or are they drill and practice?

The book concludes with a discussion on systems analysis and programming. No doubt Mr Obrist is erring on the side of caution in his discussion of LOGO. I am sure he is aware of the vast difference between a full implementation of LOGO and the various subsets of turtle graphics that are available.

Generally, this is a good book that deserves a place in a staffroom library. The illustrations are clear and in some cases amusing and its simplicity and clarity will reassure the reluctant micro user.

Tony Mullan

Logo Programming, Peter Ross (Addison Wesley, 1983, £7.95 – paper, 249 pp.)

Peter Ross starts his well-structured and authoritative book with a short but interesting history and rationale of LOGO.

Chapter 2 explains turtle graphics with lots of sensible examples and exercises using Terrapin LOGO. Don't panic, this book is not specific to any one machine or LOGO version. There are five appendices which adequately describe each of the following versions of LOGO, making conversion from one to another much easier – Terrapin LOGO, Apple LOGO, TI LOGO, Radio Shack LOGO and Research Machines LOGO. What a good idea.

Procedures and editing mode are introduced in Chapter 3, with plenty of good advice, but turtle geometry is quickly albeit temporarily put to one side in favour of Cartesian coordinates in order to speed up an animation project. Projects on a ticking clock and bouncing turtle (our high point last term), conditional commands and a number of procedures using recursion end this very full and informative section. I still don't really understand how 'doodle' works, but we spent quite a long and happy time investigating different patterns made using doodle.

Chapter 4 broaches the often talked about but seldom explained or demonstrated world of words and lists in LOGO.

Chapter 5 makes valuable suggestions about planning and debugging a larger scale enterprise using two projects (nested polygons and a number base convertor) as examples, warts and all.

'Ideas and where they might come from' follows on, and makes a neat introduction to Chapter 7, where a number of ideas for projects are suggested. Assistance and assurance are given, though you are left to develop these projects which include rotation and reflection, precise arithmetic, tangrams, mazes, language programs, a database, and pattern recognition.

This comprehensive text ends with an appendix containing answers to the exercises and a short but vital index and table of procedures used in the book.

I found this book a powerful source of ideas for introducing both myself and 10 to 12 year olds to Apple LOGO. A totally unstructured approach to LOGO is not well suited to some educational settings, and for those of us who need guidance to enable us to structure and even understand where our pupils are going, this book from Jim Howe's Edinburgh LOGO stable is most welcome.

To quote Peter Ross, p. 10:

> The purpose of this book is to help you develop the knowledge and experience to be able to make the most of LOGO as a tool . . . The power to express your ideas well and to develop them thoroughly is *NOT* a gift – it is something which can be learned and LOGO makes it enjoyable.

There is much food for thought in this, probably the best (and cheapest) British book on LOGO so far. Essential for anyone who wishes to explore LOGO beyond the floor turtle stage. I bought my copy in Boots at Watford. How the world changes!

Henry Liebling

Book news

LOGO: a guide to learning through programming

Peter Goodyear, 206 pp, Ellis Horwood/ Heinemann, 1984; cased £12.50, paper £6.50.

A lively and affirmative account, to be reviewed next time.

Databases in the classroom

D. Daines, 144 pp, Castle House, 1984; £6.95 paper.

Children and computers in the classroom

A. Mullan, 256 pp, Castle House, 1984; £6.95 paper.

MUSE Report on Micros in Primary Schools

The MEP Primary Project team (headed by Anita Straker) have written a report on microcomputers in the primary curriculum.

A large variety of specific pieces of software are discussed – and a useful reference section tells you where to get them. While it will be of interest to the more general reader (parents, all teachers, etc.) primarily the report is addressed to primary teachers, who will find it a valuable source of information, ideas and points for discussion.

This has been produced as a MUSE Special Report (A4 – 24 pp.) and is being mailed to all MUSE members. Non-members may obtain it, for £1.25 (cheques payable to MUSE, please) from: MUSE, PO Box 43, Hull, HU1 2HD.

A teacher's warning to parents buying educational software

Pam Fiddy

Teachers at the undervalued 'knickers and noses' level of primary education already suffer from a particular strain of over-competitive parent. Typically, their offspring toil at home through reading schemes and work-books with minimal opportunity for messy exploratory play or for contact with other children. They come into school unable to undo a botton or to sit next to another infant without physically attacking this alien life-form. Now such parents have access to computers and educational software, what can teachers say and do to save their children from the worst excesses of new technology?

To begin with, we can explain why some software is so appalling that no child should be exposed to it under any circumstances. Such programs were designed with the needs of the programmer and the computer in mind. All they have to do with education is that children get tagged on at the end.

Such an explanation is best done by pointing out the remarkable overlap between the type of programs it is easy to produce and a large proportion of 'educational' programs. Computers are well known as number-crunching machines. They are excellent at working out sums. Not only that, but given a few simple rules they can make up sums for themselves ad nauseam. Add a selection of chatty phrases, sound effects and pictures for the computer to produce at appropriate moments and you have the basis for endless maths drills of one kind and another.

Computers are also excellent at keeping lists and comparing one list with another. Hence all those quiz games churning out questions and checking if the user can select the right answer.

The main lessons of these programs is: 'Computers know all the answers, but you, my child, do not!'

Such an approach is like repeatedly shouting simple sentences at foreigners on the assumption that everyone understands English really. Of course it is a stupid and unimaginative way to behave, but people do it. Some parents with the best possible intentions will take this approach to their children's learning. Unfortunately, there are still adults who believe that education can only be effective if it is a bore and a chore, and that endless repetition is the answer to children's learning problems. Teachers have a duty to make these people better informed about education.

It is not surprising if the high-technology aura of computers suggests that the education they offer belongs to the future. In fact much of it is rooted in the past, and should have been left there to wither rather than being transplanted into a new medium.

Not that all educational software is rubbish by any means. There are gems. This is an area of enormously rapid growth. Everyone involved in software development is on a learning curve. The best now available is a great leap forward from the unimaginative monstrosities that once passed for educational programs. We can look forward to continual improvements, but only if market forces keep pushing the quality up. Development is expensive and can only be justified if critical consumers demonstrate a preference for something more than routine tests and drills.

Learning needs to be built on reliable foundations, to rise up wide and strong, not high and narrow. Some children have such foundations and come to school able to make sense of anything the teacher offers. Others are intellectual black holes. Anything going in their direction vanishes without trace. It takes imaginative effort on the part of the teacher to come down to their level, to find out what is inside their heads and what can be confidently built on the little they know. Computer programs designed for educational use at home should be a foundation or buttress for what goes on in the classroom, not a drill that competes with (or, horror of horrors, repeats) what the teacher is doing in the classroom.

At present almost anything is saleable and few people complain when programs prove disappointing or useless. The potential size of the home market is far greater than that of the schools. The influence of parents will affect the products developed for children's use. We owe it to the children to ensure that only the best software survives. The best way to achieve that is to teach the parents why so much of it should be left firmly on the shelves.

This article first appeared in *The Teacher.*

MAPE 'Routeway' for new secretarial services

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As a member, consider consulting your Regional Representative in the first instance.

MAPE Tape Reshape (continued) . . .

Dear Editor,
After some compatibility problems (on more than one cassette machine), we finally loaded and used the MAP Tape. *Mousey! mousey!* and *Canal locks* have been the most popular – especially with the 'submarining' bug left in!

Several faults have come to light in the *Treasure chest* program, however, for which I have devised the following corrections:

1. It is possible for the target green chest to be hidden beneath the initial blue square, so that it remains invisible forever and gives rise to much frustration. *Correction:* add the line:

```
1675 IF(X=650) AND(Y=500) GOTO 1670
```

2. It is possible to have TWO or more rectangles exactly the same size as the target rectangle. *Correction:* amend lines:

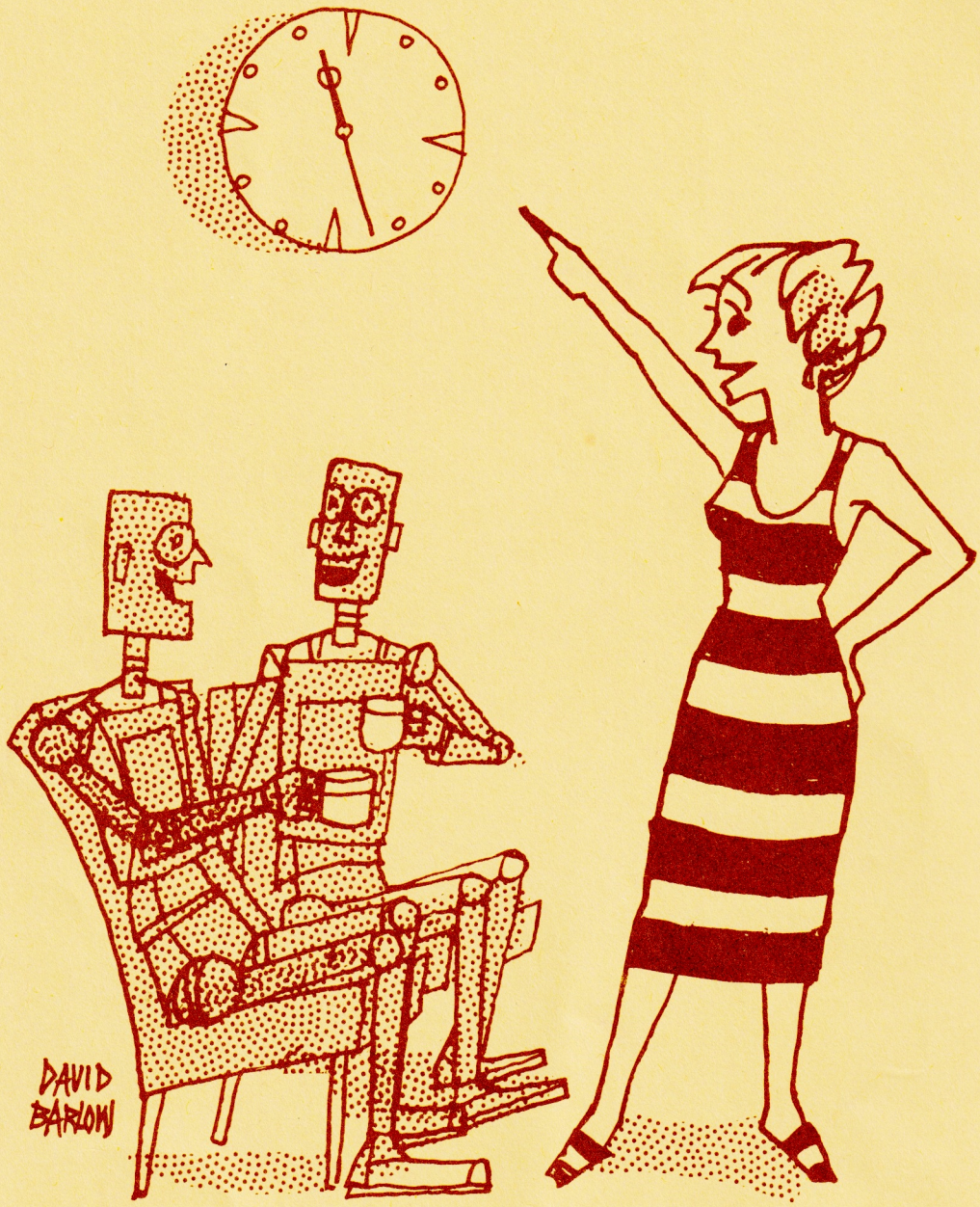
```
1980 LOCAL G
2000 IF W=width (G) and H=height (G)
     THEN FLAG1=1
```

3. In MODE 2 the minimum resolution for positions of lines is in units of 10 anyway, so that rectangles whose dimensions differ by less than 10 will appear to be the same size. I would favour a difference between dimensions of greater than the minimum visible difference in any case. At the least you need to change line:

```
1380 W=RND(30)*10+5:H=RND(32)*10+5
```

Nevertheless, thanks to you and the donors for a tape containing a wide variety of programs. None of my own programs is yet in a state to be submitted, and I must attack the problem of my cassette player's incompatibility with yours. When I have something suitable I hope to write to you again. I assume you would want programs on cassette with listings and some documentation.

John D. Drummond
London N14



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