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MICRO SCOPE

Newman College with MAPE

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MICRO-SCOPE 17

Editorial

MICRO-SCOPE 1 was published in January, 1981. *MICRO-SCOPE* is now five years old, although the association with MAPE only began with *MICRO-SCOPE 4*. I have been looking through the early editions to see what, if anything, has changed. In *MICRO-SCOPE 1* Roger Keeling described the classroom uses of a micro-computer. They were as follows: as an electronic blackboard; as a teaching aid; to give practice in skills; for testing and diagnosis; as a computer (i.e. a fast processor of numbers). Now the list is longer and much more imaginative. We would add the following uses: investigation and problem solving; the provision of a framework within which the children can create their own programs; the opportunity to use the micro to control external devices. The micro is a versatile tool; there are so many ways in which it can be used to enhance the learning in the classroom. At the moment there are too many applications for too few micros.

The first question that the staff of a school need to answer is 'Do you wish to concentrate mainly on one type of use?' and, if so, 'which one?'. There must be agreement! If any application is to be incorporated into the work of the school then the existing curriculum should be examined, the range of learning that the particular use will foster should be identified, and appropriate links made. If one class of children spend all their computer time in one year on turtle graphics what should they do next? Should they build upon that learning and extend their problem-solving abilities or should they be given the opportunity to try something else, word-processing for example? Should there be a selective 'dipping in' to a range of applications whenever there is a match between what the micro can provide and what is happening in the classroom? Is there going to be a problem for teachers? Is it reasonable to expect them to know, in sufficient depth, all the applications? Unless they do, how will they know what is appropriate? During the time that has passed since the publication of *MICRO-SCOPE 1* some of the problems have remained constant (lack of micros, lack of disc-drives, lack of printers, *LACK OF MONEY),* others have changed. There is no longer (even for RML users) a lack of software.

The early editions of *MICRO-SCOPE* were dotted with pages of programming. In John Fair's first lesson, teachers were taught how to write a program to output on screen the words of 'One finger, one thumb, keep moving'! Times have changed but the underlying principle, that there are occasions which can only be saved by a certain level of programming literacy, remains true. There are many tips to help teachers deal with problems. I was going to publish a page in each edition of *MICRO-SCOPE,* but they are so hedged with 'ifs and whens' that they become almost incomprehensible to the people they were intended to help.

There must be many people for whom the name *MICRO-SCOPE* has no meaning. The letters originally stood for the Microcomputer Software Co-Operation for Primary Education. I think I'll launch a competition (one that it is possible to answer this time) to find either a new definition or a new name (readers' suggestions are welcome). Nowadays *MICRO-SCOPE* articles refer to programs in a particular classroom context: the emphasis has shifted from the program alone to include the ways in which it can be used. This reflects the fact that the use of software should form an integral part of classroom activities. Children should not be

leaving one activity to 'have a turn' at an unrelated piece of software, and then return to the first activity. You might say that you must be fair, and define fairness as giving every child a limited number of minutes at the micro. That is certainly fair but it is unlikely that anyone is benefiting from the experience. Certain classes get a micro for one fifty-minute period per week. Where is the value in that? Is it better than nothing? Should fairness occur over a period of years rather than weeks? Is it better to have the micro for half a term every four years than for fifty minutes a week?

There are many questions. What are we going to do about software piracy? (See Mike Trott's article for one opinion.) If we look to the future, where are we going? (See Peter Hunter's article.) Where could we go if we had more money? How are we going to build bridges between the use of micros in the home and in the school? How are we going to begin to compensate those children from financially bereft backgrounds, attending poverty stricken schools, who are missing almost all the opportunities that the use of micros can offer? (Are they missing so much that micro-awareness is a very low priority anyway?) What effect is the demise of the MEP (more importantly the Primary Project) going to have. Will the Micro Electronics Support Unit be able to provide the level of support that is needed? What can/should MAPE do? It is easier to ask the questions than it is to try to answer them, but *MICRO-SCOPE* will provide a forum for debate. One feature remains constant — the plea for contributions from readers. Please write about your experiences, and beliefs and opinions. Articles are always welcome.

Snippets from past *MICRO-SCOPE*S will appear throughout the rest of this edition. *Plus ca change, plus la meme chose.*

Senga Whiteman

Letters

Points of View

Allow me to offer my views on the various issues raised in *MICRO-SCOPE 15*. I believe I can offer an overview of the points raised in various letters and articles.

Firstly the issue of commercial software versus nationally funded projects. I have a great deal of sympathy with Mike Matson's position, and would hate to be without 4Mation's adventures. I was shocked that he should use a Darwinian metaphor to explain the development of the software market. Perhaps, however, he has a point. The government provided half price micros with little or no guidance as to how they should be used and certainly no funding for releasing teachers to study this matter. Indeed a 'vast range of life forms' did flourish and many subsequently perished.

Natural selection evolution is a very wasteful process. The whole trouble with the software swamp is the number of programs available. Ratepayers' money and a vast amount of teachers' time is bound to be wasted if any proper form of evaluation is going to take place.

I would prefer future sofware developments to be led by nationally funded bodies. Take for example 'The New Community'. This is a large suite of integrated programs available free to Scottish schools from the Scottish Microelectronics Development Programme. Software houses can rarely afford to develop such large suites and tend to concentrate on piecemeal, one-off programs.

I believe that the Qwerty keyboard is a wretched device for pupils to use. Alternative input devices are going to remain 'icing on the chocolate chip cake' until a national initiative takes place. The only devices we are likely to see much of otherwise are the Quinkey and the Concept Keyboard. This is because they work with a range of software not specially written for them. Lightpens, rollerballs, mice and touch sensitive screens are going to fail because of the lack of the large range of software these devices deserve. The savage pond environment of the software market will not provide the programs.

I am not kidding myself that we are anywhere near my ideal situation. We rely mostly upon commercial software at the moment. This brings with it the need for evaluation. Evaluation is taking place all the time; 'Well, it was a waste of time loading that,' or 'That worked well, I'll use it again.' This evaluation is rarely shared with others. My interpretation of the Capital Region questionnaire is cruder than Charles Bakes'. I think teachers know how to evaluate software. They want to know, 'Among the hundreds of programs available what are the names of the small number that are actually worth using?'

If MAPE accepts this interpretation then there is something that it can do. A very simple questionnaire can be published in *MICRO-SCOPE*. The question is simple: 'Which

programs do you find most useful? List not more than ten.' Entering the information received into a suitable database should produce a Top 30. I think that for the MAPE member who cannot attend conferences or exhibitions, this is the most needed service that the organisation can render at the moment.

On the subject of conference reports and general discussion of software, will your contributors please let us know, in copious footnotes if need be, the source of the program mentioned and the machine(s) it runs on. Lack of such information makes reading *MICRO-SCOPE* a frustration. I know what LOGO is, so I can follow the discussion of it in your pages. I do not know what MicroProlog is and the magazine leaves me no wiser. The most frustrating example was Don Walton's Road Show report. I would love to try Betty Lumley's programs as 'many infant teachers are looking for these'. Well they are still looking. Please, what machine and what is her address?

I've certainly let fly in this letter and shall now pass on the name of my number one, produced by a full time teacher and part time programmer, Alan Shaw of Pagesoft, 17 Pagefield Crescent, Clitheroe, Lancs. His three suites for the BBC micro could interest teachers wishing to introduce word processing at very early stages. *Scenes Suite* requires the Star Concept Keyboard. The overlays are pictorial and the screen output is double-height text. Output can also go via the optional Votrax type speech unit. For those who know *Prompt* from MEP Blue Files, *Starword* offers a refinement of this particular approach. It is one of the *Stories Suite*, not all of which require the Concept Keyboard. Finally *Pageant* offers the opportunity to create a branching story, or even a simple text adventure.

Number two in my chart after *Starword* is *Granny's Garden* for BBC and RML480Z micros from 4Mation, Linden Lea, Rock Park, Barnstaple, Devon. So I have to agree that the commercial software market has produced some gems. If MAPE follows my suggestion a *MICRO-SCOPE* questionnaire will uncover more. Failing that, members could send in their own top ten for publication. At the same time MAPE is right to push for major national funding for specific packages.

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Betty Lumley's 10 programs on a BBC 40 track disc, together with documentation, can be obtained by sending a cheque for £7 (payable to Betty Lumley) to Betty Lumley, 26A Chamberlain Way, Pinner, Middlesex HA5 2AY.

vorsprung durch software!
(progress through software)

I am grateful for the opportunity to respond to P.J. Mate's review of my program, *The Last Adventure (MICRO-SCOPE 16)*. The rather cursory dismissal of the package on the grounds that it required too much effort, initially brought on familiar feelings of despair. However, I was reassured the same evening by a telephone call from another reviewer (also a primary school teacher) raving about the package, asking for more details and suggesting all sorts of exciting applications.

I know that this may well sound like sour grapes on my part, but it is not. Many software writers can produce ready packaged, inflexible programs and churn out more and more of the same thing with only the numbers or words changed, but this is not my desire. I believe that by doing so I would not be providing valuable material.

During my three years with MEP I was keen from the start to offer teachers flexible software; initially we responded to demand for rather boring (from my point of view) software — matching, sequencing, etc. But I always insisted that, whenever possible, the software should allow teachers to input their own data — without rewriting program lines (remember those days?). Imagine my disapointment to find, on visiting a school, the staff using only the examples provided by the program. Were they geared to the needs of the individual children using the program? I don't doubt it, I know they weren't!

However, there were always a few teachers who found time in their busy day to type in a few words at the computer (instead of writing a banda master) and who encouraged me to persevere. Later, we produced adventure writers, simple at first, like *Your Adventure.* Again, many teachers continued to use our sample games but few said, 'Can we add conditions?' or 'Can the kids create their own pictures?'. It was for these teachers that I wrote *The Last Adventure,* The 'Can we's?' not the 'Why don't you's?'.

I believe that *The Last Adventure* is about as flexible as you can get but its flexibility demands thought and planning. I am sure that many teachers are able and willing to do this because they want to create something more interesting and more relevant than the well-packaged but inflexible material that is frequently offered by publishers.

In case you think that I am just a programmer with no teaching experience I should point out that I too am a teacher and have used the package myself in schools, most recently with 11 year olds, but I didn't write the games, they did

— a five location game, with graphics, conditions, exciting story line, humour and creative writing to bring a warm glow to even the most hardened teacher, such as:
'The marsh is a greenish colour. Its murky waters have enveloped many an unwary traveller.'

All in less than three hours. A great deal of spin-off maths work was undertaken as well. What is more, the children had little experience of adventures, and no experience of the package beforehand.

The point of all this is not that I wish to knock teachers unwilling to try the package; we all have our own styles and interests, which is what makes the profession so strong. But I am knocking those who seek to advise teachers on software yet lack imagination and foresight, and I would be quite happy if both of these groups gave the package a wide berth — if you don't want to drive on mud, ice and snow, or up and down mountains, you don't need a four-wheel drive car.

A final point, I could recommend a course of action for the 'Why don't you's?' suggested to me at my son's parents' evening. The school had recently received a new piece of software and my son's teacher and a colleague were struggling to get into the package. She told me that after some time her colleague said, 'I know. Let's give it to the kids, they'll sort it out'.

Not the ideal course of action in all circumstances, I admit, but I know who's primary school I would prefer my sons to attend. *Vorsprung durch teachers?*

Michael Trott
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Inkberrow
Worcs

To prove that I stand by what I write, I am willing to support the ambitious adventure writer with a *Last Adventure* help line — 0386 792008; 8pm—10pm.

Classrooms of the future

A reply to the last edition's "Viewpoint"

Peter Hunter
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Pondering about classrooms of the future is bound to be something in which members of MAPE are likely to indulge, perhaps more so than most teachers. The last edition of *MICRO-SCOPE* contained Patrick Drewett's musings on the matter and it is to what he said that I now respond. This response, I'm afraid, is somewhat critical of him.

My general feeling is this: computers and education are the two principle elements of MAPE's concern. First of the two should always be education. Mr Drewett, it seems, is rather too bowled over by computers.

MAPE members, by now, should have passed the stage of standing back in awe and amazement at what modern technology can do and should be asking serious questions about the role of computers in schol, the kind of classroom tasks which involve the computer, the nature of children's learning and the part that the computer might play in this. Any 'ideal' school should be one in which such questions are, at least, tackled (not necessarily to be answered conclusively) and in which, as far as the computer is concerned, greater attention is given to software rather than hardware.

Mr Drewett begins his description of the ideal, not with an educational consideration, but with one about computers, and not with a choice of software but with a choice of hardware. He says, 'Given unlimited resources, one 16 bit micro per child would be my ideal'. This, of course, is not an ideal. It is merely as far as he can see. Why, with unlimited resources, did he not request 32-bit micros or a minicomputer each? What about a mainframe in every primary school?

The reasoning that Mr Drewett gives is this: 'Sixteen bit micros would give the flexibility required by top quality programs, and sufficient memory for user-space.' But what programs? It seems to me that, not so long ago, an 8-bit micro was thought to be more than enough for most educational jobs. Indeed for some, it still is. For many purposes now, though, an 8-bit machine is considered too restrictive. What is more, I believe that a 16-bit machine will also prove to be too restrictive.

Let me illustrate my point. On the one hand, there may be some uses of the computer, such as the typing in of the first draft of a piece of text into a word-processor, for which an 8-bit micro would be quite adequate. In the case of this particular example, a compact, battery-operated, portable machine (for example, the NEC personal computer) would seem to be what is needed.

On the other hand, more sophisticated operations, such as scanning that same piece of word-processor text not only for spelling errors

but also to provide advice on sentence structure, choice of vocabulary or compositional style, would require far more computing power than a 16-bit micro could offer. Ideally, the school should offer such a service to aid children's writing, which suggests that a range of computers of differing shapes and sizes may be necessary. An 'ideal' computer might even be capable of 'speech-driven' input.

What of Mr Drewett's views on education? Well, he says, . . . 'the majority of lessons can be taught better by a computer with a well designed program. . . .' Presumably, he means that computers are, or will be better than teachers (although he doesn't actually say what computers are better than). I am amazed at his over-estimate of computer power and his under-estimate of human reason. However, his 'ideal' teaching-machines may be flawed, because, 'where the program fails, the teacher can step in with human expertise'. I suppose that such failures could be characterised as leaks springing in the educational hosepipe.

When it comes to the teaching of mathematics, there is an implied self-contradiction in what Mr Drewett says. First he talks of computers making it more efficient for children to do pages of sums, then he goes on to question such an approach by introducing LOGO into the debate. At this point we have the meaningless statement, 'It is doubtful whether 50 per cent of children educated on teacher-maths are capable of solving problems'. What is 'teacher-maths'? What problems? How does he know this fact about children's capabilities?

Then we are told, 'LOGO covers the maths syllabus'. How do you teach place value to a seven-year-old with LOGO? I am, personally, quite enthusiastic about LOGO, but I am also aware that research into its use, subsequent to Papert's eulogising, does raise questions about what it can do and, especially, about what approach should be taken by the teacher in using it. Even with LOGO on the 'ideal' computer, it may still not be capable of reaching the parts that other (human) teachers can reach.

As for the music curriculum, Mr. Drewett suggests 'community singing with music played by an electronic synthesizer'. And this, apparently, is going to encourage socialisation. I'm flabbergasted!

Now that I have got this far, I'm beginning to wonder whether Patrick Drewett was really writing with his tongue firmly planted in his cheek. I hope he was. Whether he was or whether he wasn't, though, perhaps I should conclude with a few words and predictions of my own about computers in the classrooms of the future.

Notice that I avoid using the word, 'ideal'. This is quite deliberate on three grounds: (i) we haven't yet worked out what an ideal classroom would be like without any computers let alone with them; (ii) the technology keeps changing and just as you think you've worked out what you might like, something else comes along and upsets your plans; and (iii) pipe-dreams don't get you very far.

As we move forward into the foreseeable future, with our present economic plight, we are highly unlikely to get anywhere near one 16-bit micro per child, financed by central or local government, even if that was what we wanted. Therefore, any significant increase in the computer/child ratio in schools will be at the children's (or their parents') own expense. Like calculators, remember?

What is likely to arrive at school in the satchel (or Tesco's carrier bag) will be some portable computer or other, like the one I have already mentioned in relation to word-processing. Such computers will probably have, built into them, word-processing software, database software, terminal software and a language or two, one of which may be a variety of LOGO if the resolution of the liquid crystal (or whatever) screen is up to producing acceptable graphics. The school's problem will be the interfacing of a host of different portables to its own computers and peripherals.

The children will use their own machines for writing with or maybe fact-gathering in the field as well as in the classroom. They will use the smaller number of more powerful machines in school for more complex operations, like further work on their text, printing, collating information from different sources or graphic display, design and manipulation. Additionally, work in groups, with such programs as *Developing Tray* or adventure/simulation games (or even 'real' simulations), may still be based on the powerful, classroom computer whilst for many projects in control technology, little portables will be quite sufficient (What can be done with a ZX81?).

Thus, the range of types and sizes of computers in school will broaden with, perhaps, more varieties of the general-purpose computer actually dedicated to specialised functions. Possibly we will have something sophisticated enough to be described as an 'educational expert-system', a tutorial machine which is genuinely reactive to children's learning difficulties in the way that a good, human teacher can be. Such a machine, I think, is further away than some people may expect, except possibly in a few, quite specific curriculum areas.

A final thought directed more at the editor of *MICRO-SCOPE* than Patrick Drewett: MAPE members and the MAPE journal should be more profoundly critical, in the genuine sense of that word, of the uses of computers in schools, than

other primary teachers. After all, MAPE members are likely to have a much greater awareness of what computers can or cannot do. Some teachers, less enamoured of the technology than some of us, will rightly say that it does not offer a panacea for our educational ills. The objectives of MAPE will be poorly served if articles like Patrick Drewett's pretend that computers can provide such a panacea.

Patrick Drewett replies:

Thanks to Peter Hunter for pointing out the outrageousness of my article. However, some serious points arise both from my article and from Mr Hunter's reply.

1. Should we be content with the present limited resources in terms of hardware and software, or should we be striving to obtain sufficient finance to obtain an 'ideal' classroom/school microcomputer system?

2. Have we formulated an idea of what an 'ideal' system comprises? If not, is this because technology changes too quickly, because we have not given the matter enough thought, or because the issues are too cloudy for a clear perception of the ideal?

3. Do we need to plan for the introduction of the latest technology into schools? Should out-of-date computer equipment be utilised in other areas of education, and is an overall strategy needed for the re-allocation of outmoded equipment?

4. Can children use the computer too much, and have we identified the areas in which the computer is more efficient than the teacher, and those where the teacher develops learning better?

5. Are we content with the incompatability of the hardware and software of different computer manufacturers, and if not, what would be the best course of action?

6. Should as wide a range of microcomputing applications as possible have been experienced by children whilst in primary school, or should a restricted range be experienced in more depth?

7. What are the best ways to use computers for stimulating the thinking processes and developing problem-solving techniques in children? Does 'real-time' problem-solving have any advantages here?

8. Should parents be expected to provide computer equipment for their children's use in school, and, if so, will this lead to inequalities of opportunity?

Any comments?

Editor's reply to Peter's final paragraph

'Viewpoint' exists to provide individuals with an opportunity to present a personal point of view. It is hoped that contributions will provoke debate. Readers may not agree with Patrick Drewett but his article focused attention on an issue which needs exploring. MAPE members will formulate their own ideas about the role and potential of the micro-computer in education.

A person who is a member of MAPE will not, necessarily, have a greater awareness of what computers can do than a person who is not a member. MAPE is an organisation designed to foster mutual support and encouragement. MAPE members are enamoured with primary education, not technology, and try to use micros to promote children's learning.

"voices from the past"

'At the staff meeting on the following day, I proposed the purchase of a computer, which caused a great deal of unrest, guffaws etc.'
(Simon Webb, MICRO-SCOPE 1)

'Of course, many primary teachers still have negative reactions, ranging from caution to fear.'
(John Lane, MICRO-SCOPE 2)

'I really trusted him, Inspector.
That's why I let him run the school fund.'

Viewpoint

Squeaky clean?

Michael Trott

During the last year or so the whizz kids have been at work. Some have contented themselves with earning fame (or infamy) beavering away into the night cracking software protection and writing 'bit for bit' copiers so that it is now virtually impossible to protect software against copying. This has lead to the unbelievably incongruous situation where many teachers, entrusted with instilling moral values in our children, have literally hundreds of 'stolen' copies of software in their possession. However, this is only one aspect of the problem, a new breed of wreckers of the dreams of software authors has recently arisen — the software librarian.

By software librarian, I do not refer to that honest and trustworthy band who work in most teachers' centres and carefully supervise inspection copies, but to those who have decided, against all the threats and pleas on the front of software documentation, to loan software.

Why is it a threat? Why is it wrong? Why do they do it? Who cares? I do, and I'll explain why.

First, why do they do it? I believe that in some cases it is done for the same reason that *some* teachers take pirate copies of software. Education is underfunded, therefore, they reason that it is in the interests of teachers and children that I do this. Wrong. You may see why later. Another is the often popular, 'It's over-priced and not very good anyway'. That one is easy. If it's over-priced, why not ask why it's so expensive. You may be surprised at what it costs to develop and market a program. If you're not satisfied don't buy it, and if it's no good, you don't need it anyway, do you?

A third reason for this new game is that devised by the traditional librarian who either feels threatened by the new technology's encroachment into his territory and possibly fears for his job or wants to show his schools, and bosses, that he is 'up to date'. If this is the reason I hope that when he has finished reading this article he will realise that he is riding on the backs of other people's efforts to his own advantage and to their detriment.

Why is it a threat, and why is it wrong? The two are bound up together. First, there are straight commercial reasons, one sale to a library of a program at, say £10, is obviously worse for a publisher than say, the 5–10, he might expect to sell, as a minimum, to the authority. Publishers have priced their products on an individual school basis and will continue to do so. The loan system abuses this. Publishers do have costs to bear and they hope to recover them (more of this later). In addition, this method of distribution encourages piracy — after all, where do people get the programs to copy? I am not convinced by assurances that 'Our teachers have signed an agreement not to infringe copyright' when many do not recognise that copyright exists and when some teachers tell me that *only* 60% of their programs were from 'other sources'.

A point which is just as serious, but not so widely recognised, is the damage this system can do to an author's or publisher's reputation. This can suffer in two ways: as programs are circulated they are bound to become grubby, damaged and unreliable; this can give a poor impression of the program which is less likely if you obtain the new program in its shiny package. The second problem arises with content-free software, particularly with for example, spell checkers and language programs. In content-free programs what goes in must be accurate if it's to be used. The danger comes when incorrect data is not erased but passed to the next school. The package becomes unusable and the publisher gets the blame. To those librarians who reply with, 'Well if it lets them put the wrong answer in, it can't be any good', my answer is that they do not understand children, teaching or modern software and shouldn't be meddling in this area.

In most cases software is ordered without declaring that it is to be loaned and to be available without adequate supervision. This is dishonest and immoral. Just as the 'hackers' should realise that there soon will not be anything to copy if they carry on as they do, so software librarians need to put their houses in order. Come clean with publishers and either agree terms or do not order their programs.

You will realise no doubt that I have very strong feelings on this subject; it is not just because I am worried about losing money myself, although I do feel that this would not be unreasonable, since believe it or not, my work has cost me more than it makes. I am genuinely concerned that the educational software 'industry' (dirty word there) will die if people are not at least modestly rewarded for their efforts, and more importantly encouraged to produce more and better software.

If your school has no money or if the software

is no good, don't buy it or if you do and can't use it, send it back without copying it (it's no good to you anyway) with a letter explaining why and asking for your money back. And, if the 'industry' dies for these reasons, at least it will have died for honest reasons.

I am sure that my comments will have upset many people and will provoke a flood of protests. I sincerely hope so. I too have been upset, as other authors are, by the loaning of my programs against my wishes and without the agreement of myself or the publisher. I must say that I would welcome the opportunity of a dialogue with those librarians who would wish to work with authors not against them. At the moment, I have more respect for the skill of the 'hacker' than I do for those running unauthorised loan schemes. Come on, restore my faith, we are both working to the same end. Aren't we?

If you reach the end of this with the feeling that the author is out of touch, you might like to know that one of his jobs is as 'software librarian' in a teacher's centre which does not loan software because we believe it is wrong to do so.

Chalkface to Ivory Tower

Bridging the gulf between teachers and researchers

Charles Crook
Psychology Department, Durham University

There has always been a certain tension between teachers and the various researchers who fleetingly invade their classrooms. So, a few months ago and in these very pages, Heather Govier cautioned academics to do some accommodating — if they wished to be taken seriously by the teaching profession. This article is about taking each other seriously.

I am not going to enter debates about which group, if either, needs to give ground. There is quite another approach to harmony; namely, one that identifies a section of ground already held in common and then tries to facilitate more mingling over it. Indeed, the point of this article is to argue that a space of just this kind has been created by our mutual interest in classroom computers. This is not merely to identify a point of shared curiosity. It seems to me that contact with this new technology has, in subtle ways, served to bring many teachers closer to the research enterprise and many researchers closer to a teaching perspective. If I can convince you of this, I shall exploit the situation to make a very practical suggestion regarding one way in which we may now cultivate closer and more constructive relations.

What follows are impressions that emerge from my own contact with both parties. Remarks pertaining to the research community are made with greater confidence because I am located within it myself. My claims about what is happening among teachers are sincere observations but, being made by an outsider, they invite your contradiction.

Briefly, the argument goes as follows. In trying to study the educational applications of microcomputers, researchers have been confronted with real limits in their understanding of, on the one hand, children's learning and, on the other, classroom practice. This forces upon them an orientation to their research that corresponds more to the natural perspective of teachers on the same problems. For their part, teachers using microcomputers have moved into the domains of academics by pestering them for clearer educational theory and for access to the research methods that verify prescribed practices. I shall elaborate each side of this claim in the following sections.

Some bridges from teaching

Of course, the value of theory and research has always been widely accepted within schools. Moreover, any curricular reform is likely to renew such interest in underlying theory and its validation. But the takeup of microcomputers is not like any ordinary curricular reform. In this case, the pressure for clarification seems more vigorous and more confident. Here are a number of factors that may help account for this.

(1) Microcomputers are infiltrating an unusually wide range of classroom activities. Quite simply, they are very hard to avoid.
(2) The resource appears to many in a most unfamiliar, even alien, technology. Thus almost everyone is drawn in to what is happening at some level and many are drawn in with a particularly critical frame of mind.

As it happens, even the most hostile of attitudes will probably not prevent microcomputers entering the school premises — too many authorities have decreed that this much at least must take place. Once they are

accepted in principle, the challenge of finding software creates more opportunities for critical appraisal. Consider these two points. (3) There is an abundance of products but a shortage of purchasing funds. (4) The self-contained quality of much software somehow manages to make very conspicuous the educational goals and philosophies of its authors. So, purchases must be made with special care but the bases for evaluating the products are quite accessible. This is a potent situation for generating debate and for consolidating personal theories about the medium.

Finally, note one other factor in all this. (5) Much classroom software, unlike other curricular materials, is the product of commercial enterprises having no strong association with the educational/academic establishment. This is very liberating: an absence of the usual daunting respectibility can only serve to encourage more confident judgements.

In short, various factors converge to force a strong mood of critical interest among teachers: new classroom resources are getting a particularly close inspection. Within such an atmosphere it is not surprising that central questions relating to educational theory and research are being aired. However, the level of involvement in such issues goes yet deeper among teachers who move from being interested consumers of classroom software to become innovators themselves. This may involve them in the design of programs. There is something very sobering about that activity: it seems to extract a stark account of one's educational principles and prejudices. Moreover, the end product is so embarrassingly public.

This situation is quite exhilarating. Teachers are encountering bold educational theory — some of it perhaps bad theory — both in the design of software and in prescriptions for its application in the classroom. From this, but also from an independent desire to innovate, there comes new discussion of such theory and demands for research that will justify it. Put it from the viewpoint of the academic researcher — there seems to be some muscling in on our action.

Some bridges from research

It is claimed that the new technology has lured teachers into matters academic. The complement of that claim involves an argument that this same technology lures researchers into perspectives closer to that of their teaching colleagues.

Very broadly speaking, two classes of research are involved here: evaluative and innovative. Techniques for the evaluation of current practice are readily available and such ventures are in cautious progress — the circumstances of the technology and its introduction do create especially challenging problems. A common concern for such evaluation should alone serve to bring teachers and researchers into a more sympathetic relationship. However, there is a further bridge from researchers that is a little more subtle than this. It derives from their attempts to advance in microcomputer applications in a more innovative way.

The truth is that research of this second kind is pretty scarce. As soon as it is tackled, blocks and problems seem to arise. However, it is my claim that the remedy to those problems is something that should bring us closer together. The difficulties can be profitably located in the broader context of artificial intelligence (AI) research, for this will identify the more general class of problems involved.

When behaviourism ruled psychology, the boast was—give me the child until (insert some age) and I shall create for you a tinker, tailor, soldier (and so on). Rather conveniently, ethical and practical considerations never allowed much of a test for these claims. However, behaviourism has given way to the 'cognitive science' framework and that invites a new test of adequacy for psychological theory: will our understanding of a psychological process permit it to be mimicked on a computational device? Developing classroom computer resources from a basis of theory has the quality of this venture.

It is widely admitted that the AI enterprise has, so far, been disappointing. But at least the effort of trying it has woken us to our surprisingly limited understanding of even the simplest real-world psychological function. Such limits are revealed in the fields of educational and developmental psychology as clearly as they are anywhere else. Those fields are the sources for accounts of children's thinking and learning that might inspire the design of computer-based activities. Yet attempts to model or incorporate such theoretical knowledge are scarce and, generally, uninspiring.

There are many ways in which we may fault research traditions in these areas. I would venture one very general shortcoming that underlies the present stagnant position in relation to innovative research: our accounts of cognition and learning have been excessively piecemeal. To put this another way, cognitive processes (facets of memory, reasoning, attention and so forth) have been examined too much in isolation. That is, in isolation from each other but also in the 'laboratory' kind of isolation that separates them from the social settings and cultural practices within which they normally occur.

This reductionist approach is not intrinsically a

bad strategy and it does, of course, conform to the models of Good Science. However, it may not conform to that intuitive analysis underlying a teacher's own models of knowing, learning and instructing. In other words, the style of analysis favoured by classroom observers (researchers) may be significantly different to that developed by classroom participants (teachers). So, if researchers are caught in a mismatch between problems and technique, then the appropriate solutions may well serve to draw their perspectives closer to those of the teacher. The practical message for academics is that they must attend to how cognitive resources are *integrated* and, also, locate their observations more in the everyday contexts within which thinking and learning occur.

It would be wrong to overstate this and imply that the whole tradition of research into children's intellectual development is somehow irrelevant. Neither should it be thought that the knowledge we do have is so fragmented as totally to resist transformation into computer-based activities. But this transformation is difficult. For example, my own experiences led to confronting what may be termed an 'interface' problem. In tackling early number development, I may be able to capture theoretically-derived ideas and embed them in an interactive computer task. However, the realization of those ideas as a *usable* program does demand an unusually broad consideration of cognitive and motivational detail regarding the user. For those accustomed to dealing in controlled and rather static situations, the problems of developing and engineering computer-based activities can be daunting.

A practical proposal

If this new technology prompts teachers and researchers into a more common perspective, then this is surely an occasion to create media for better communication. My 'constructive' contribution is to propose a particular forum for just this purpose. First we might note how such a link could benefit both parties and, then, consider the more exact form that the exchange might take.

Insofar as there is a growing interest in research and evaluation within the teaching community, then there is a need for greater access to certain specialist resources. This requires conveying developments within the research literature and identifying important sources. Where individuals are interested in pursuing research activities of their own, it would be valuable to have a resource for seeking possible precedents and their outcomes. Still more valuable would be the opportunity to seek direct advice on issues of methodology and techniques of analysis from those in possession of such expertise.

For researchers, there is a need to extend the level of their classroom understanding and to draw upon the special insights that teachers derive from such close familiarity with children engaged in computer-based activites. That cumulative experience can be of enormous significance to the guidance of research initiatives. Moreover, there is a special gain in publicising those more formal research projects pursued by teachers in their own schools; they may have very direct influence on the mainstream of research.

What this implies is a media for communication with certain properties. It should document recent developments as quickly as possible. It should be available for the widest range of interested parties to contribute. It should support real debate — that is, a medium where contributions and their feedback can be quickly assimilated. Finally, it should be capable of responding to apparent needs of the users and evolve accordingly.

These requirements are surely met by an intelligent computer bulletin board facility. In fact, I propose that such a resource should be established to meet the needs generated at points where the interests of teachers and researchers overlap. It could provide a selective database of completed and ongoing research as well as a directory of research interests. It might be a resource where 'surgery' advice on research methodology could be sought. Perhaps, most intriguing, it could be a forum in which topics for debate and reflection could be established. For example, one research interest of my own happens to be the various consequences of organizing computer working practices as collaborative activities. I do not doubt that there is a rich vein of experience (as well as formal research claims) on such a topic and that it could be most usefully assembled on this interactive medium. I am sure there are many other examples.

I have a special reason for pursuing such an initiative: my own base at Durham University is and English node for one North American network upon which discussions of research on computers in education is an important topic. Thus, it would be possible to filter and assimilate some of that material and give the activity an international dimension.

If there is a real case for a resource of the kind proposed then, unfortunately, the problem of funding has to be confronted. Any case for funding will be all the stronger if a good level of prior enthusiasm can be demonstrated. I would be most interested in receiving and collating your reactions.

The Line of CITE

David Smith and **Ros Keep**
CITE (Centre for Evaluation of Information Technology in Education)

Educational research isn't exactly flavour-of-the-month for many teachers. Indeed, we sometimes feel when we introduce ourselves to groups of teachers, the same warm glow of welcome that a child molester would get from the Mothers' Union. As far as some people at the chalk-face are concerned, research is merely a form of licensed child abuse. And for all the good which a lot of research has done over the years, they may have a point! So why do we think we are going to be any different?

CITE stands for 'Centre for the Evaluation of Information Technology in Education'. We are a newly-formed unit of the National Foundation for Educational Research (NFER). The Foundation is well-known to teachers, both as the developer and publisher of all sorts of test materials, and also as the source of many authoritative reports on a wide range of educational problems. In fact, NFER is Britain's foremost independent institution dedicated to research into education. The Foundation has great expertise in a wide range of disciplines and subject areas, and a long history of success in its attention to its chosen field. We at CITE are specially concerned with matters to do with educational applications of computers and computer-based information technology, but we have all the resources of NFER to back us up. We are part of a formidable team.

Well, what *are* we doing? Quite a lot of different things, of course, because our field is very wide and it is wide open. But we are concentrating particular attention on issues surrounding software evaluation. Unfortunately, evaluation research seems to be one of those areas where teachers and researchers have got a little out of step. All too often, the things which have attracted the attention of teachers have not interested researchers, and vice-versa. In general, teachers have wanted quick answers to pressing problems. Researchers on the other hand have turned their backs (all too often they have turned up their noses as well!) on this type of work, in favour of 'fundamental' issues. Frequently this means that by the time the research is reported, the problem has gone away! And even if it hasn't, it is usually only other researchers who can understand the reports — and sometimes not even them! But we don't see why research can't serve both the short-term needs and interests of classroom teachers *and* the theoretical viewpoints of researchers. We are trying to develop projects which do both.

And we go further than that. We don't really accept that the reader/researcher division in the education profession is a genuine one. 'Teachers' and 'researchers' describe activities, not membership of rigid castes. We are all (supposedly) engaged in the common enterprise of education, and there is no sense at all in setting up the barriers of a sort of intellectual apartheid.

So, a key part of our approach is that we work *with* teachers, not *on* them. Most people in the Foundation are experienced teachers, but we are generally rather remote from the pressures of the classroom, and so we sometimes lack some of the special insights which develop out of day-to-day practice. On the other hand, of course, we have skills and knowledge which are, in the ordinary run of things, difficult for teachers to acquire. Therefore we like to think in terms of teamwork: an equal partnership between classroom teachers and educational researchers. That, at least, is our ideal, and we're working on it — even if we've some way to go before we get there.

We are trying to develop a method for evaluating IT-based learning media and environments which can be used, refined and further developed by teachers themselves. So far, we have worked up the skeleton of a case study approach which we are now just beginning to flesh out in collaboration with teachers in Berkshire. In fact, apart from trials and pilot tests (well, 'flight simulators', anyway) the first phase of our evaluation project got under way in September 1985.

Our evaluation process has two parts. First there is a review by groups of teachers, subject specialists and (revolutionary this) children. The reviewers use check-lists to say something about the technical qualities of the material. This doesn't refer to the number of 'GOTOs' per square centimetre, but to the apparent potential of the package as an educational resource. We say apparent, because we feel that the value of reviews is limited. In the end, it is not the qualities of a program as a technical object which determine its success or failure. It is what happens in the classroom. Educational resources are dynamic not static: they come to life in use, and they can only be evaluated fairly in realistic classroom environments. This dynamic aspect is

what really interests us most. How does a 'resource' become a learning experience? How can other teachers achieve comparable results? And what sorts of problems arise?

We are aiming to develop a format for the description and dissemination of practical classroom experience which actually approximates to reality. So many 'case reports' seem faintly unreal. You know the sort: 'After five minutes they were all solving Schrodinger's Wave Equation and booking the National Theatre. . . .' Some superb work *is* done, there is no doubt of that whatever, but the glossy reports can be intimidating to that substantial minority of teachers who are still trying to fight their way out of the MicroPrimer. It's like listening to Vladimir Ashkenazy, then being told that all *you* need to do the same is a piano! To most of us, life's just not like that.

We have discussed this with many teachers and they almost all agree that they would like some realistic idea of what is being done. Not (they are most emphatic here) how to do it. Given insights into other peoples' solutions, good teachers have enough imagination and professional expertise of their own not to need their hands held. But they do need information. And it is reliable and accurate information they need, not the computerised equivalent of mediaeval 'Here be dragons' travellers' tales. In fact, what seems to be needed is a disciplined case report method analagous to the one which the medical profession has gradually evolved. That's what we're working on. Naturally enough we're not the only people with the idea, but we believe that with the resources available to us and the goodwill and enthusiasm of our teacher colleagues, we'll at least be able to make a significant contribution to what is undoubtedly a growing movement within the teaching profession.

Over the next year or so, we shall be working to try to get some of the rough edges off our ideas. We've divided our time into three mini-projects, each lasting about one term:

1. Adventure games in primary schools
2. Word processing
3. Conventional CAL software

Each has been chosen both because of its immediate interest to teachers and because it involves particular technical problems of evaluation. For example, educational adventure games pose problems of classroom observation and reporting. At the same time, we are working closely with Berkshire's advisory team in order to consider ways of making information and ideas rapidly available to schools other than the ones which are working with us. In fact there has been tremendous enthusiasm and interest throughout the county, and we are trying to help sustain this interest. All in all, the prospects for the coming year seem very exciting. But this is only a beginning. Our 'mini-projects' are intended to locate questions, not answers. In the long run, we shall be looking to work with our classroom colleagues to refine and develop a practical approach to the evaluation of educational resources and media.

NFER has always tried to be an approachable sort of institution, and we in CITE are proud to be part of this tradition. So why not approach us? We're always delighted to make new friends and thus keep in touch with old ones. We look forward to hearing from you, or better still, to meeting you at the next MAPE conference.

* * * *

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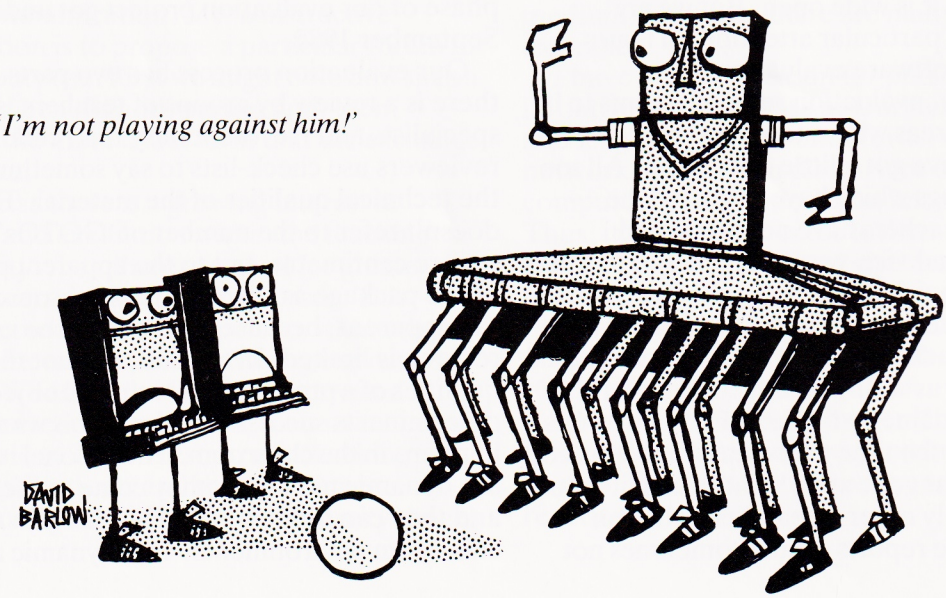
'I'm not playing against him!'



The creation of a topic based resource pack

C. J. Broadbent
Burnley Wood County Primary School, Lancashire

Wouldn't it be nice to be able to go to the school software library and to pick out an appropriate suite of programs to whatever topic you were doing, suitable to your age group and the environment of the school? Very often the software available simply does not fit into the curriculum of a particular school. On top of this there is the age-old problem of expense. A school's capitation is often stretched to the limit without spending up to £30 on one program and its accompanying resources. One way round this is to make up your own resource packs using 'content-free' software available through various bona fide channels.

Some 18 months ago I had the idea of writing an adventure program based on the story of the Witches of Pendle. Anyone familiar with the folklore of Lancashire will know the story and its popularity as a topic in the area. However, my programming ability was not up to producing anything worthwhile so the idea had to be shelved.

Last year I was lucky enough to be seconded to Newman College where I was given the opportunity to pursue my idea. This enabled me to produce a resources pack based on the story, containing five programs and ideas for how the pack could be used in schools.

I was very familiar with the background story and so it was a simple matter to find appropriate programs to be used in the pack. The 'content-free' programs were *Tracks, Tray* and *Mallory* from the MEP Primary Project Language Pack, *Factfile* from the Micro-Primer Pack and finally a simple question and answer program I wrote myself, but *MQuiz* (Micro-Primer Pack) would fit the bill.

The actual conversion of the programs was a simple task, albeit very time consuming. The *Tracks* program gave the children the opportunity to move around the Forest of Pendle collecting evidence which would convict the witches. I walked around the actual locations taking photographs, which replaced the screen graphics of an adventure or simulation program. If anyone has used *Tracks* they will know how complex the use of all 20 locations can be. However, the children who have used the program have re-created some quite accurate maps.

Mallory was changed to *Read Hall,* a notable location in the story. All the main characters in the story were to be found, with suitable comments, flitting around the various rooms. This was perhaps the hardest program to adapt as the actual data lines of the program needed changing. However, it shoud not present an insurmountable problem for any teacher familiar with program listings. A new version of *Mallory* has been introduced by the MEP Primary Project. It includes a Scene Creation File which makes adapting the program extremely easy. This version is included on MAPE Tape 3. If you are not a memberof MAPE your LEA should have a copy of the updated version, contact them.

Tray only needed a piece of the story to be typed in for 'developing'. After school trials of the pack, this proved to be the most popular program.

Factfile gave me a simple database program which was easy to use and familiar to most schools. The information typed in was about the characters involved and it enabled the file to be used as an 'identity parade' game. The children could add to the file and make up their own questions, both valuable elements of information retrieval.

The fifth program was simply one to test the information the children had found with *Tracks.* If the children answered all the questions correctly, the witches were found guilty and the children were allowed to progress to the next section of the pack.

The pack itself consisted of photographs, booklets, development ideas, specimen work cards, background story and teacher's operating instructions. It included a description of educational aims and objectives.

I'm sure a major problem has already sprung to mind, that of the time element. Where would a busy class teacher find time to produce anything as large as *Pendle*?

The simple answer is that they wouldn't. Not on their own anyway, but there is nothing to stop a group of teachers joining together and creating their own resources pack. The subject matter would be determined by the area of the school and the particular strengths and weaknesses of the teachers. Certainly, my pack would have

benefited from other teacher's ideas and suggestions.

Lancashire, my LEA, are at the moment producing ten *Pendle* packs for distribution to teacher's centres around the area ready for the next academic year. I hope that this will motivate teachers groups to get together and produce similar resource packs.

Introducing a teletext emulator

Glenys Marra
Primary Computer Development Project, Dundee

A number of teletext emulators are available now for the BBC machine. They fall into the category of content-free software and as such have enormous potential for educational use. Having examined several such packages Tayside Region decided to obtain a licence for *Telfax*. Written and developed in Edinburgh by Peter Barker, *Telfax* is a powerful package. In choosing this home-grown product it is important to state that patriotism did not affect our judgement. This is a superb package for introducing children to the power of teletext and has tremendous potential in both primary and secondary schools for the construction of electronic newspapers, reference pages on projects, magazines and notices. The creative medium offered by *Telfax* enables children to explore the real world of electronic communication.

As with any powerful package, documentation is of the first importance. The notes provided with *Telfax* cover all aspects of the package and also included are instructions for setting up a trial database which explores some of the facilities available. It must be pointed out that this is not a package for use by teachers with no previous experience of computers. Teachers must be prepared to familiarise themselves with the package before introducing it to children. Time spent by teachers on this task is amply rewarded later.

The package consists of two main programs—*Putfax* which allows a database of pages to be created and *Findfax* which is used to search such a database. A demonstration database is included with the pack and this gives some idea of its potential. The latest version of *Telfax* now allows pages to be printed out using a *Printmaster* ROM but if this is not available any Mode 7 screen dump can be used.

Using *Telfax* with primary children

In working with primary school children I decided first of all to help them to set up a fairly small database of pages using *Putfax*. The *Telfax* disc contains a facility to print out function key strips for use with the editor. The key strip, fig. 1, is definitely too complex for initial use by primary children and throughout the work with *Telfax* improvised keystrips were used.

In the beginning we concentrated on text only. Using the bottom line of the keystrip we produced our own keystrip, Fig. 2, which was coloured appropriately. This allowed the children to create pages of text using coloured characters and the flashing on/flashing off facility. This meant that only one key press of a function key was needed for each colour change. Technicolour text became the order of the day and many initial pages produced by the children were so colourful that sunglasses were not

CTRL+ SHIFT	Conceal	Contiguous Graphics	Separated Graphics	Reveal	Black Background	New Background	Hold Graphics	Release Graphics	CANCEL Edit (key twice)
CTRL	copy window	Remove Character	Delete to End of Line	Remove Line	Insert Character	Insert Line	Copy Line	Double Height	Normal Height	
SHIFT	Red Graphics	Green Graphics	Yellow Graphics	Blue Graphics	Magenta Graphics	Cyan Graphics	White Graphics			
Save Page	Red Characters	Green Characters	Yellow Characters	Blue Characters	Magenta Characters	Cyan Characters	White Characters	Flashing ON	Flashing OFF	

Fig. 1.

SAVE PAGE	RED CHARACTERS	GREEN CHARACTERS	YELLOW CHARACTERS	BLUE CHARACTERS	MAGENTA CHARACTERS	CYAN CHARACTERS	WHITE CHARACTERS	FLASHING ON	FLASHING OFF

Fig. 2.

inappropriate. This phase soon passed as children gave critical attention to their work. Pages are saved on disc using f0 and children were soon creating and saving pages of text. *Telfax* offers three ways of progressing from one page to another when using *Findax* to view the database. The page links are set up when a page is first written but the page links, which are held in a separate file, can be edited at any time. We experimented with all three methods and the children were soon using *Findax* to view their pages. By this stage the children had become familiar with the fact that a space was required to hold the colour change character and that, although this was invisible on the screen, the character which is over the cursor is displayed at the top left hand corner of the screen. This allowed them to experiment by changing colour while leaving the text alone. This was most helpful in making critical decisions about colour combinations.

Once the children were familiar with these facilities we moved on to introduce double height characters. As can be seen from the original keystrip (Fig. 1) these characters are produced by holding down the control key and pressing f7. The children were delighted with this new addition and confidently edited many previous pages to insert double height headings. Shown here are samples of the kind of pages that were now being produced.

```
Jey no.                                   Page 100

        FACTS ABOUT OURSELVES

        1  Keith Cryle
        2  Paul Cuthbertson
        3  Micheal Palmer
        4  Susan Ramsay
        5  Syed Shah
        6  Charmaine Airlie
        7  Colin Mason
        8  Andrew Reid
        9  Louise Tyrell

TYPE A NUMBER TO FIND OUT ABOUT US
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Jey no.                                   Page 180
                    ANDREW REID

My name is  Andrew Reid.

I am 6 years old.

I live in Blairgowrie.

I have a  blue  and yellow  bike.

1 RETURN TO MENU
2 LOUISE TYRELL          3 KEITH CRYLE
4 PAUL CUTHBERTSON       5 MICHEAL PALMER
6 SUSAN RAMSAY           7 SYED SHAH
8 CHARMAINE AIRLIE       9 COLIN MASON
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Jey no.                                   Page 110
                    KEITH CRYLE

My name is Keith Cryle. I am 11 years
old.My birthday is  November 2nd. I
have one brother. His name is Michael.
My hair is short and curly. It is black
My eyes are blue .I am 1 metre 47cms
tall. I weigh 29kg.

I have lots of friends.At school I play
with Paul,Micky,Syed and Susan. We play
football. At home I play with Dean and
Lee. We play with BMX bikes. We play at
the building site and make a big hut.
We play soldiers in hut. I found an old
helmet but I threw it away.


1 RETURN TO MENU
2 PAUL CUTHBERTSON 3 MICHEAL PALMER
4 SUSAN RAMSAY     5 SYED SHAH
6 CHARMAINE AIRLIE 7 COLIN MASON
8 ANDREW REID      9 LOUISE TYRELL
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```
Jey no.
 We interviewed the janitor and we
 found out that he comes in at 6:30 a.m
and opens up the school,sets the
cleaners tasks for the day,repairs
anything that is broken and has as much
fun as possible.He doesn't like the
school because of the low fencing all
around.
      It is hard work being a janitor
and the hours are long.It is a very
responsible job because he has a lot of
diffrent jobs to do.He has only worked
as a janitor for 1 year and is doing a
good job.He has only been here at this
school for 4 and a half months.He meets
hundreds of peoplle like joiners,
painters etc.He comes back at night at
6:00 sometimes until 10:00.Mr. Mulligan
has been wakened up a few times during
the night for break-ins or just because
the alarms have gone off.He now knows
where most things in our school are.
        Reporter Arlene Scott.
      Whitfield Primary School. 7a2.10
```

Now it was time to introduce background colour. Using another improvised keystrip we proceeded and allowed time for the children to assimilate this new skill. By this stage the children were clamouring to be told how to produce graphics. They were very familiar with CEEFAX and ORACLE pages on television and wanted to add diagrams and pictures to their own pages. Building up Mode 7 graphics, as anyone with any experience will know, is not as simple as it looks and I was afraid that the difficulties encountered might ruin the enthusiasm that abounded. Therefore I decided first of all to begin by using only full squares of colour which could be planned on ordinary 1cm graph paper. Children had to be made aware that a change of colour required a space on the screen but they were already familiar with this aspect from previous work with text. The school emblem, Fig. 3, was produced in this way.

Graphics require use of the shift key and the function key simultaneously but as the colours are produced by the same keys as for text this posed few problems. The copy key then produces a solid character of colour. By planning drawings on graph paper children happily

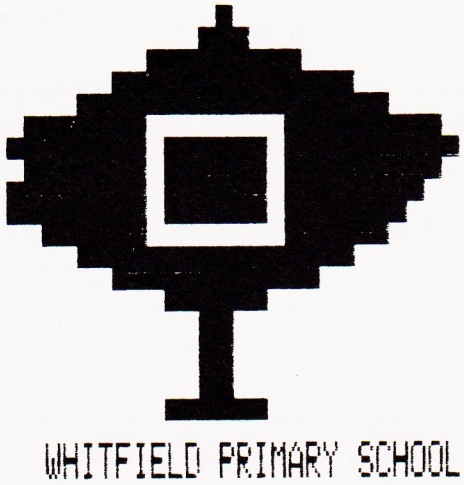


Fig. 3.

tackled this new facility. They quickly realised that by using a background colour they did not have to insert a new colour and could therefore have different colour squares adjacent to each other. This rather simplified method of producing coloured graphics on the screen proved very popular. As the appropriate squares were being produced by one key the actual time needed at the keyboard was not excessive and this permitted groups to complete pages without difficulty. Children were not allowed to plan at the keyboard and quite happily accepted this discipline.

By this time the pages produced by the children were quite professional. Almost complete keystrips were now in use and editing facilities such as — delete to end of line, remove character, insert line, remove line, copy line etc. were now being used. Children with previous word processing experience were particularly quick to use these extra facilities. In developing these aspects it is best if new keystrips are designed for individuals or groups as new facilities are added to their repertoire.

The main issue of full graphics capabilities was, however, still not resolved. It was time to resort to the major cure-all — improvisation. Out with the coloured sticky paper, the glue and the scissors. After a number of prototypes we eventually resolved the problem by making our own dominoes of graphic characters. The key which produced that particular pattern on the screen was written clearly on the back, Fig. 4. As there are 64 graphic characters altogether we realised that by offering all of them at once we would rapidly disappear beneath a sea of sticky cardboard. By limiting the choice initially we were allowing greater definition without too many combinations to complicate the issue. At first we used all the graphic characters which produced vertical or horizontal lines along with the solid block which was already in use. As the

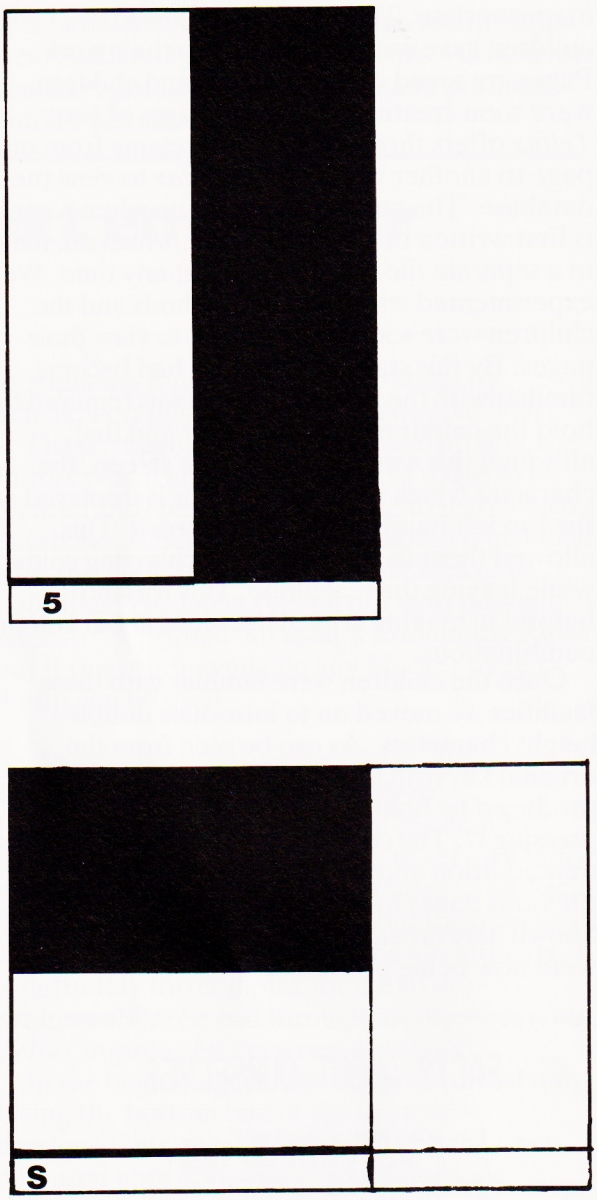


Fig. 4. Dominoes shown actual size. (The little extra strip at the bottom shows which way up the domino goes and we quickly began to use this to include the key which produced the graphics.)

children became more confident with the technique more characters were added. The graphic dominoes were laid out on A3 size planning grids and when the picture was complete the dominoes were turned over to reveal the keys which required to be pressed. These characters were then copied to recording sheets which were taken to the keyboard.

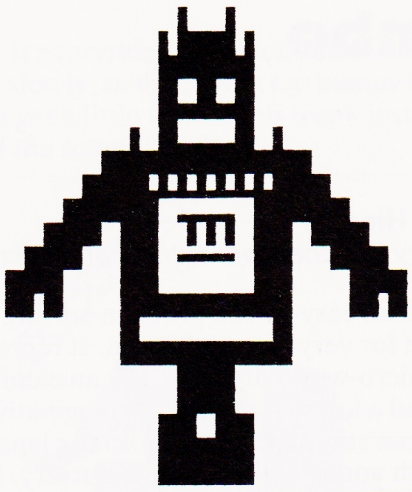
Given this concrete aproach to the work I believe that eventual transfer to the use of the traditional teletext planning sheets will be accomplished with few difficulties. For anyone wishing to make their own dominoes I would advise the use of coloured card and black wax crayon — no glue! By choosing appropriate colours of card all the on-screen colours can be

used. As the children had been involved in making the dominoes they quickly grasped the idea of the variety and scope available and they became increasingly aware of the graphic effects that were presented on CEEFAX and ORACLE. This link with the real world was yet another important aspect of the work.

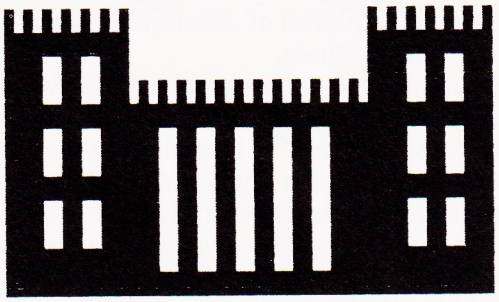
In addition to the features mentioned *Telfax* also contains some powerful editing facilities which are of particular interest to the teacher. Pages or windows from any *Telfax* files may be copied into the current database and edited to fit the user's requirements. This copying facility can also be used with any file which contains images of Mode 7 pages, in particular CEEFAX, ORACLE, PRESTEL or *Edfax*. If a window within a page is being copied it may be copied one or more times into a page as it is edited. This facility is of particular use in situations where pages carry a standard heading, message or graphic as this means that it needs to be typed in only once and consequently cuts down the keyboard time considerably. It also allows graphics which have previously been created to be used many times with appropriate editing.

Several primary school classes in Dundee worked on the package and it was exciting to see the range of work produced. I must stress again that this package is not for the beginner or the faint-hearted but experience has shown that primary pupils can reap many benefits from such a package. Teachers who worked with me have expressed great interest in following up this initial work. In the session 1985-86 we will be working on several new databases which will be built up on project material researched by the children. It is envisaged that, when completed, these databases of information will be catalogued into the School Library to become valuable resources for the pupils. Some staff, inspired by the work done on Domesday are keen to produce a similar type of *Telfax* database covering the local environment. They are keen to exploit the fact that graphs, pie-charts, histograms and pictures can be inter-mingled with text. Children in the Partial Hearing Unit which is situated in Hillside Primary School in Dundee have worked with *Telfax* during this session and the staff are keen to continue. Children with hearing difficulties have particular problems with vocabulary and many ordinary textbooks are inappropriate. It is hoped to set up a number of *Telfax* databases for the children's use in which the vocabulary is specially tailored to their needs. By involving the children in the process of creating the pages the motivation and enthusiasm to use the finished product is high.

Telfax is not simply a software package but a truly flexible learning tool which can be used to explore the world of electronic communication. I have no hesitation in recommending its use.



ROBOT

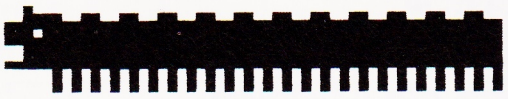


CASTLE OF DANGER

CATERPILLAR ON A LEAF

Funny little caterpillar
Black and green and juicy
Little legs frilling
Squirming over a leaf

Eat quickly little caterpillar
Chomp up all the leaf
The blackbird is watching
With a hungry beady eye



MY TOOTHBRUSH

References

Telfax is available from:
P. J. Barker
45 Priestfield Road,
Edinburgh
EH16 5HX
LEA licence from £100 depending upon the size of the LEA.
Individual copies approx £30.

Jumbo

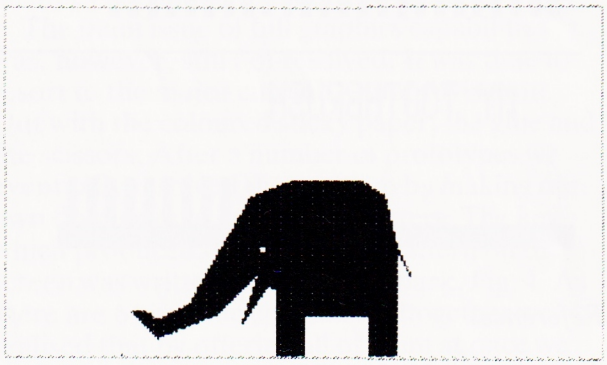
Pauline Higgins
Advisory Teacher for Mathematics, Ealing

Jumbo is an easy-to-run problem-solving program for very young children. It represents a small 'micro-world' inhabited by an elephant, a crane and a lorry. If used in an imaginative way *Jumbo* can stimulate a lot of exciting language, even with young children in the nursery. I have been fortunate in being able to use it in many schools with children of different ages and from various backgrounds.

I generally use the program with the whole class but ideally a group of about six to ten would be best. I start by asking how many of them have been to a Zoo. Fortunately, most have seen animals on the television or pictures in books, but this does not always give them the true concept of the real size of an animal in relation to themselves. We talk about very small animals and then go on to very big ones, I have been given chimpanzees as examples of both large and small. Eventually we get on to discussing elephants and how big they can be: how many could we get into the classroom?; is the door big enough to let them in? I have been told quite a few times that an elephant is as big as a double-decker bus. At least all the children in this area have seen a double-decker bus.

After this sometimes lengthy discussion on the size of an elephant which brings in a lot of mathematical language, I tell them about poor Jumbo, the elephant with a very sore leg.

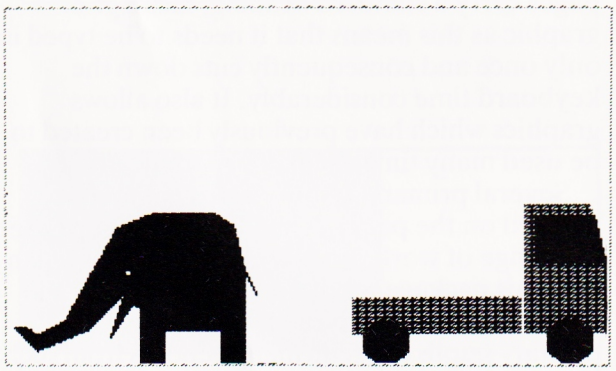
Press E



```
>> Elephant
>>
```

How can we get poor Jumbo to the Zoo vet? (This often entails explaining what a vet is.) Many weird and wonderful suggestions are given including an ambulance, car, make him walk, carry him . . . etc. Eventually the idea of a lorry will come, especially if at first you can give good reasons why certain ideas will not work, for example, an ambulance would be too small or Jumbo would be too heavy to carry. The children then start to think up reasons why another child's idea will not work.

Press L



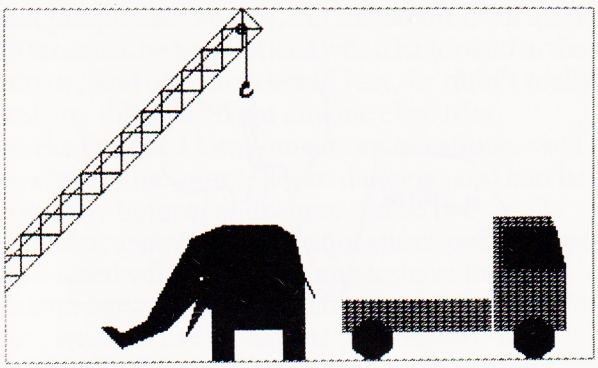
```
>> Elephant
>> Lorry
>>
```

Two kind gentlemen have let us borrow their lorry. But how are we going to get Jumbo up on to the lorry?

This is when the fun starts. At first the ideas are very conservative, but once they realise that Jumbo definitely cannot walk and is much too heavy to lift, even by two or three men, the more imaginative ideas come:

Use a hot air balloon; build a platform under him and then get a hundred men to lift him up; use a fork lift truck; (a good idea but we haven't got one!) Surprisingly enough the idea of a crane does come to some of the children without too many hints. I have never actually had to tell them that a crane would probably be useful.

Press C



```
>> Elephant
>> Lorry
>> Crane
>>
```

Now the problems start. How are we going to attach Jumbo to the hook of the crane:

by his trunk — would you like to be lifted up by your nose;

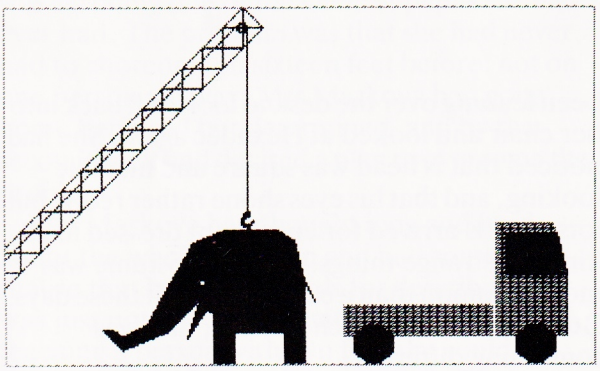
tie it to his tail — (from another child) you might pull his tail off and elephants look funny without a tail;

tie string round him — the string would break;

Use chains — they would hurt his tummy;

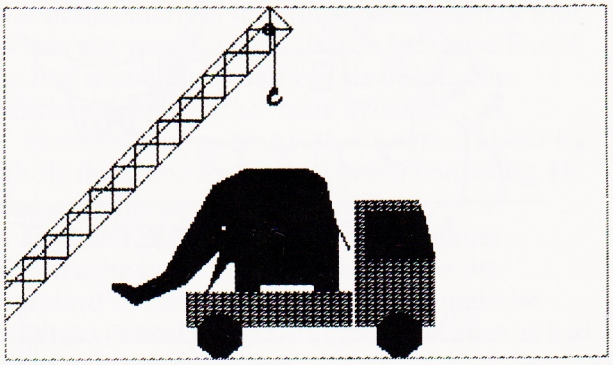
Wrap something soft around his tummy, then tie that to the hook.

Press D — to bring down the hook
Press T — to attach the hook to Jumbo



```
>> Crane
>> Down
>> Tie
>>
```

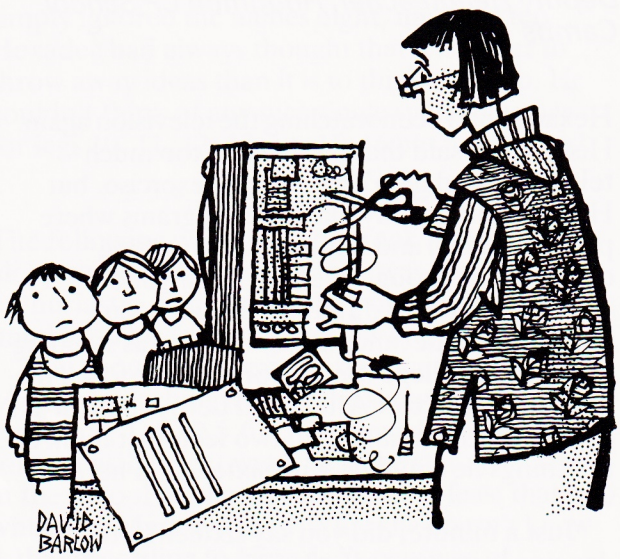
The children then have to get the correct sequence of events, in order to get Jumbo up on to the lorry and then unhook the crane before the lorry can drive off to the Zoo vet. If anything goes wrong then you get a cross look from Jumbo. If everything goes well Jumbo is driven off very slowly, so that it isn't too bumpy for him, and you get a little wave of his trunk just as he goes off the screen.



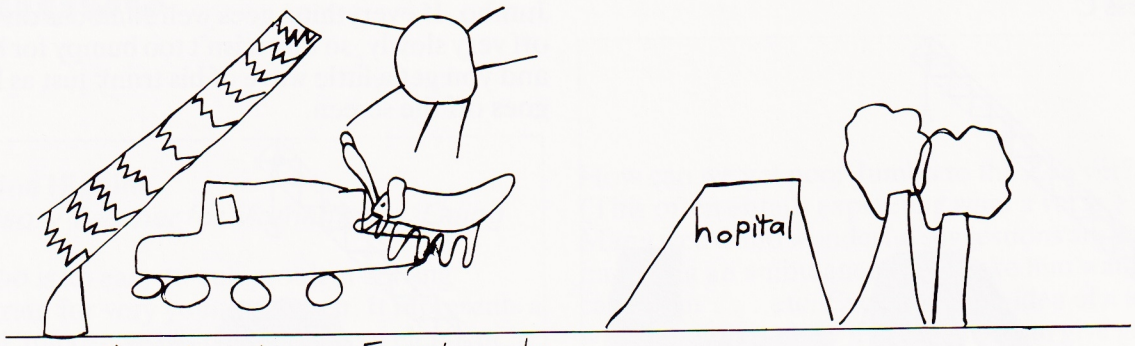
```
>> Down
>> Release
>> Up
>>
```

There goes Jumbo still smiling

This program really does stimulate a lot of thinking and discussion even with very young children and this can lead to more problem solving, drawing and creative writing. On page 20 is one example of some writing a six year old did for me after seeing the program.



What aren't micros made of?
What aren't micros made of?
String and sticks and things we can fix
That's what micros aren't made of.



Nellie the Elephant

Nellie fell over and broke her leg and She didnot no how to get to the hopitail She tour and then She had an I dear She whent to find a tellephon box and then She Phond them up then the lorry came and took him and wen he went he waved.

How Hexadec found his feet

Don Walton
Deputy Headteacher, Houghton CP School, Cambs

Hexadec had been watching the television again. His mother said that he watched too much television and didn't get enough exercise, but Hexadec only really liked the programs where people danced and felt that just watching dancing was enough exercise for anyone.

This time it was different, he had been watching 'Fame' and that is why he was standing outside the college waiting for a chance to see the dancing instructor. After all, if Leroy could do all those fantastic things with two feet, just think of the things he could do with sixteen. So here he was. . . .

'Just a minute, did you say sixteen?', the dancing instructor asked as Hexadec was filling in his form at the table.

'That's correct', Hexadec answered and shuffled uncomfortably. It sounded rather like a stampede when he shuffled his sixteen feet. When the noise stopped the instructor, who had been leaning over the desk to look, fell back into her chair and looked at Hexadec again. She had noticed that is head was square and metallic looking, and that his eyes shone rather redly, but lots of kids arrived for enrolment dressed in all kinds of strange things. A robot costume was more common than a cowboy's outfit these days. But sixteen feet, which worked, that was something different.

Mrs Markova, that was the name of the dancing teacher, told Hexadec he would have to take his costume off if he was coming to the dancing class. Hexadec didn't understand this and said so. Mrs Markova looked rather impatient and told Hexadec that dancing in fancy dress was not allowed, unless it was part of a performance. Hexadec told Mrs Markova patiently that it wasn't fancy dress, and that he had always been like that. Mrs Markova leaned over the table again and counted one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen. Yes, there were sixteen feet. She slid back into her chair again looking at Hexadec closely.

'Are you a robot?' she thought, and then she asked Hexadec the same question. Hexadec said that people said he was, but that apart from a few differences he had noticed when he looked in the mirror, and of course his 16 feet, he didn't really feel any different from anyone else. Mrs Markova asked him some more questions, such as why did he want to learn dancing, and had he done any before, and where did he live. . . ? Hexadec answered all the questions politely and wondered when he was going to have his first lesson. Mrs Markova told him to come along next week at the same time and they would begin. Mrs Markova had forgotten to remind Hexadec to bring his class fee as well. She shouted after Hexadec to remind him about it. He turned slightly to say he wouldn't forget and as he did so, the foot third from the front on the left hand side was tangled with the foot fourth from the back on the right. Hexadec tripped and another dent joined lots of others on the bottom of his casing. Mrs Markova put her hands to her ears as a sound like a lorry-load of cans filled the hall. She asked Hexadec if he was OK and he said he was. Mrs Markova looked a little worried as Hexadec left the hall.

Next week soon came around and Hexadec arrived at his dancing lesson promptly. The first lesson was, understandably, a bit of a struggle for Hexadec had never been to a dancing class before. Mrs Markova was a dancing teacher of long experience and didn't normally have any problems with students who were keen. Hexadec was certainly one of the keenest pupils she had ever had. The problem was that she had never had to choreograph sixteen feet before; not on one person anyway. Mrs Markova had gone home bemused but determined, and by the second week had devised a plan to overcome the problem.

Mrs Markova had thought long and hard about the whole situation and had come to realise that her set of words for describing feet was just not up to the situation. If she was teaching a person with two feet she could call them the right foot and the left foot. That was perfectly satisfactory, but one person with sixteen feet was a new problem. Mrs Markova decided to number Hexadec's feet, and with this in mind she bought a tin of paint and a brush.

Hexadec was rather suprised when he saw Mrs Markova with the brush and paint but when she explained what it was for, he soon agreed to have them numbered. Mrs Markova started and made the numbers as big as possible. 1, 2, 3, 4, 5. Mrs Markova had a lot of trouble with the number 6 as Hexadec was particularly ticklish on that foot. There was a lot of leaping around and clanking and Mrs Markova had to wipe off a few attempts with paint thinner but eventually number 6, 7, 8, and 9 were painted on clearly, so that she could see them from the back of the hall. The problem was 10, 11, 12, 13, 14, 15 and 16. They were two digits, and she couldn't see them from the back of the hall. Also she found that shouting sixteen was not as sharp as shouting nine or eight or four. When she was shouting sixteen Hexadec found he had moved foot number six before Mrs Markova came to the 'teen' syllable.

Hexadec was getting rather worried about the whole thing and found it all rather confusing. He had gone home very depressed.

It wasn't that he hadn't made progress, because he had, but he was not up to the standard of Leroy, and Hexadec thought he ought to be twice as good at least, because he had eight times as many legs.

It wasn't until Hexadec was clearing out his book cupboard and saw his favourite Alphabet book that an inspiration suddenly whizzed through his chips. There were two surprises here. The first was that he had been given to understand that he would never have a good idea because of the way he was made, and the other was that it was such a good idea.

The idea was that when Mrs Markova got to 9, she simply began painting his feet A, B, C, D, E, F.

Why, you might ask, did Hexadec not put letters on all his feet and that would have been a very good question. Mrs Markova asked this question too. The reason was that Hexadec had always wondered what to do with his legs over ten because he didn't need them for counting. Octopuses, he knew, only counted in eights because of this and called their counting 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 20 but they simply ignored the names eight, nine and ten. Hexadec had always thought that it is easier to throw away ideas than it is to think them up. He couldn't think of any nice single syllable names for legs 10, 11, 12, 13, 14, 15, 16 but now he had.

1,2,3,4,5,6,7,8,9,A,B,C,D,E,F

The following week Hexadec took his ideas along to Mrs Markova and she was very enthusiastic. She got out the pot of paint and numbered his feet with the new system.

You should see Hexadec dance now and Mrs Markova teaching him. If she shouts the sequence, 1,A,D,5,6,6,4,5, Hexadec is able to follow easily. Next week he is the star attraction at the school public performance, at least that's what Mrs Markova says. What she doesn't know is that according to Hexadec's new way of numbering 6+6=C. He thinks this system of using numbers might come in useful one day but in the meantime Hexadec has really *found his feet*.

Children's Competition Number 2

Roger Keeling

As promised this competition is based on three programs in the MEP Primary Project Maths Pack, namely *Boiled Eggs*, *Bounce* and *Blocks*. Entries should be from individuals aged 12 or under, and accompanied by a teacher's signature to confirm that the work is solely that of the pupil. Entries must be sent to the Editor (Comp), *MICRO-SCOPE*, Newman College, Genners Lane, Bartley Green, Birmingham B32 3NT by first post on March 14th. The first three all-correct entries selected will receive one of the MEP Primary Project Packs for their school; a choice between the Problem Solving Pack, the Infant Pack or the Control Technology Pack. The three individuals will each receive a £5 voucher for themselves. Now for the questions:

Q1 Based upon *Boiled Eggs*

Write down the sequence of instructions, where possible, in order to boil the following eggs. One of the three cases is impossible. State why.

	Red timer	Green timer	Egg
a)	9 mins	6 mins	5 mins
b)	8 mins	5 mins	9 mins
c)	9 mins	7 mins	15 mins

Q2 based upon *Bounce*

a) If the ball is fired at 45 degrees, how many bounces does it take for a table of width 42 units and height 28 units?
b) If the aim is to sink the ball so that the counter reads 11, give one set of possible dimensions of the table (the height must be at least 3)
c) If the ball is fired at the angle shown below, how many bounces will it take on a table of width 24 and height 18?

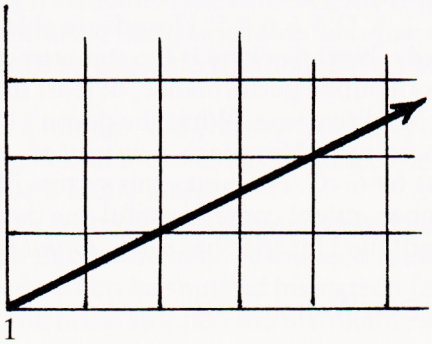


Fig. 1

Q3 The following grid shows part of a game of *Blocks* between players A and B. Player A has shaken the following numbers, 6, 2 and 2. Write down all the combinations that will give him a winning move.

0	1	2	3	4	5
6	A	A	A	10	B
12	13	A	15	B	B
18	A	A	A	B	B
24	25	26	27	B	29
30	B	32	33	34	35

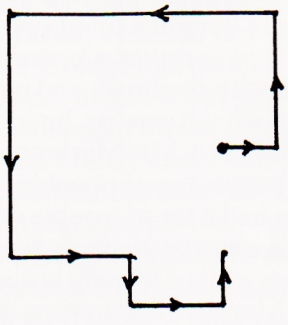
Fig. 2

Now for the answers to the last competition

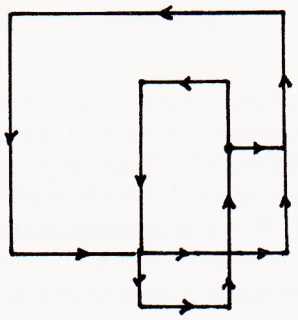
Q1 One route round the network is shown below. There are other possibilities. In fact there are many other possibilities and I apologise for asking for *all* of them when I should have asked for just *one*. In fact a supplementary competition for adults (or children) is to write a routine which outputs the number of different solutions.

ABD

ABDGH



ABDGHALGHB



A B D G H A L G H B C E F L K C D E

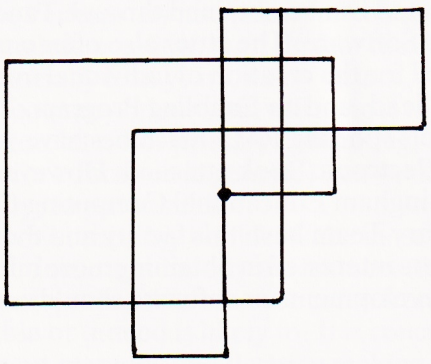


Fig. 3

Q2 Here is the graph. If you do not understand the answer perhaps you should ask your teacher.

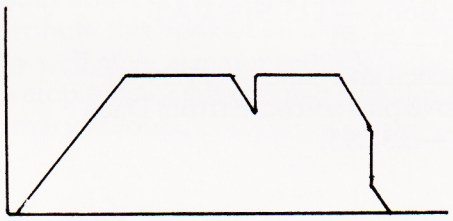


Fig. 4

Q3 The first number grid is shown below and is the only answer to the problem. The second grid is only one of many different answers.

4	5	6	7	8
7	10	13	16	19
10	15	20	25	30
13	20	27	34	41
16	25	34	43	52

Fig. 5

16	15	14	13	12
11	16	21	26	31
6	17	28	39	50
1	18	35	52	69
-4	19	42	65	88

Fig. 6

Results of the last competition

Although we weren't inundated with mail from the competition in *MICRO-SCOPE 16*, we did receive a number of interesting entries. Douglas Hill of Robinsons End Middle School, Nuneaton managed to find 50 routes round the network; class J3 of Wanborough Primary School near Swindon produced a very well presented entry with strip cartoons to accompany the Eureka problem and Anne Piggot and Beth Watson of Westgate Junior School, Lincoln successfully produced a computer printout of their Eureka graphs. Two other very good entries came from Kirstie Bell and Gregory Gibbs also of Robinsons End School.

However the first correct solution opened came from **Ian Eggleton** (age 11) of Sandhurst CE School, Sandhurst, Gloucester with the runner up prize going to **Andrew Wain** (age 10) of Townsend CP School, Bucknall, Stoke on Trent. Well done to all those that entered!

'Is that the Editor?' Every time I try to take a bath, some kid rings me up about that competition?'

Reviews

The Tandy Electronic Book

A number of recent television programmes have featured an add-on to the BBC micro, manufactured by Tandy and called the Electronic Book. This peripheral, to all intents and purposes, appears to be an ordinary loose-leaf folder, connected to the Beeb's analogue port via a cable. However, like most apparently simple devices, it has hidden depths and offers intriguing possibilities in the primary school classroom.

When the book is opened a series of twelve numbered pads can be seen on the back leaf, a small junction box connecting to the BBC cable, and the usual metal rings for holding file paper.

Now a wealth of software is appearing and revealing this books enormous potential. With suitable programs, it is possible for ordinary A4 sheets of paper containing teachers' or pupils' drawings, writing, or pictures, to be placed into the ring binder and for these creations to be pressed in response to questions or instructions from the computer.

Using common materials, the teacher can design useful teaching exercises for children with a wide range of abilities, and tailor this material to specific problems and personal needs. In addition to this the book negates the need for slick keyboard skills and allows the child to work at a more practical level where he/she is able to press pictures rather than abstract symbols arranged in an unfriendly way on small lumps of plastic.

The pads are arranged in the book in three columns containing four pads each. The pads are the size of a small child's fist and are extremely sensitive — sensitive enough to detect a press through at least twelve pieces of laminated paper. The book is also attractively manufactured, and whilst not carrying a lifetime guarantee, because it can function at a distance from the computer keyboard (on the child's desk for instance), should outlive all but the most ferocious tantrum.

The MEP Semercs, Tandy, Daco Software and others are producing a variety of software that extends the scope for this book in the primary school classroom. Some of the more recent software will be reviewed in the next issue of *MICRO-SCOPE*.

People who have *heard* of the Electronic Book tend to make comparisons with the Concept Keyboard, against which, for most applications, it comes a poor second. People who have *seen* the Electronic Book in action tend to dismiss such comparisons as so much nonsense. The Electronic Book is a different beast, requiring different software and satisfying different applications.

The Electronic Book is sold at an attractive price and can be obtained through Tandy or Daco Software. The latter also offer a useful stencil for the creation of individual overlays, a BBC lead, and an Enabling Program. Those schools sporting RML machines have yet to see the Electronic Book attached. However, Birmingham Educational Computing Centre Primary Team have this facility and those readers interested in obtaining more information on developments or software should contact them.

Geoff Turrell
Primary Computing Support Team, Birmingham

Prices

Electronic Book — £15.50+ VAT.
BBC Lead — £5.50.
Overlay stencil and paper — £1.25.
All the above plus software (from Daco Software) — £31.95.

Addresses

Daco Software,
59 McKenzie Rd.,
Moseley,
Birmingham B16 4EP.
(021) 449 2253

BECC Primary Team,
BECC,
The Bordesley Centre,
Camp Hill,
Stratford Rd,
Birmingham B11 1AR.

Tandy Corporation (Branch UK),
Tameway Tower,
Bridge St,
Walsall,
W. Mids WS1 1LA.

Report review

MEP's softly softly swansong?

Computers in the Primary Curriculum.
MEP's Conference Report, 1984

Has anyone seen it yet?

Some months ago a small buff-coloured A5 booklet of some 40 pages appeared on my area of the desk with the note, 'Have you got a copy of this?' Well, I hadn't — I wasn't even aware of its existence. Perhaps, by now, many of you are in a more fortunate position, but I do fear that in these financially lean years, many others, possibly too many others, still will not get to see it until it is too late. For primary computing, (and probably for education in general) that would be a great pity, to put it mildly.
In many ways, this tiny booklet is the most important document for anyone connected with primary computing that has ever come from the MEP stable or indeed is likely to. It is concerned with **current planning and decision making** so that today's children can grow up to be confident users of the new technology' (p 2). The paucity of MEP's funding (and that of its future offspring, the MSU, too) is serious enough. That sufficient money could not be found last year or this to distribute this booklet on a far, far wider basis may well mean a major setback to the effective development of educational computing in primary schools.

The contents

The booklet itself is actually a summary of high-level discussions, between members of the MEP, the HMI, LEA advisors, lecturers and teachers, which took place during the early part of 1984 at Elcott Park in Berkshire. The views and recommendations expressed, however, are not to be taken as representing those of MEP or DES. (Indeed, curiously, there is nothing about any editorial responsibility as such. For some obscure reason there is not even an index either, although the paragraphs are numbered as in other HMI reports.) The document has been sent to LEAs, teacher training establishments and regional centres with the express hope that it will be widely read by all those concerned with policy making in the primary sector — and to this end it may be freely copied (please note!) for use in schools and colleges. The authors are fully aware that there are no easy answers and that new developments may well modify their recommendations. Nonetheless, what they offer is a concise, clearcut contribution to the present debate on the role and implications of microcomputers in primary schools. Constructive comments are given on a whole range of topics, from the limitations of current equipment to management implications at all levels. The list of the ten chapter headings shows the ground they cover:

1. General considerations in using the computer to support good primary practice.
2. Changes in primary education.
3. Implications for teacher education.
4. Special needs for infant and first school children.
5. Content free software: a toolkit for learning.
6. Information storage, retrieval and manipulation: an example of a software tool.
7. Computer support for the teaching and learning of mathematics.
8. Computer support for creative uses of language.
9. Primary science and control technology.
10. Important issues.

The tone, throughout, is positive, constructive and realistic. Good primary practice is continually stressed, with the emphasis on computers **not** being used as a substitute for direct, firsthand experiences, neither replacing human contact nor taking over the teacher's role. Indeed, the theme of the very first chapter is underlined with the cautionary note that the:

'introduction of the new technology should be approached in a manner which pays due attention to the known needs of primary aged children.'(p 1)

The 'toolkit for learning'

One of the most striking ideas put forward is that of the 'software toolkit'. A key problem faced by teachers (and children) is reaching that plateau of software satiation, of 'what should we try next and how do we choose?' To overcome this plateau, the concept of a software toolkit is suggested, a common core of powerful, content-free programs which would include:

— LOGO (or at least Turtle graphics)
— a wordprocessor
— a hierarchical database (such as *Animal*)
— a relational database (such as *Factfile*)
— an adventure-game maker.

Such a 'toolkit for learning' might be extended by adding a Prestel emulator, a spreadsheet, a control package, a graphics package, *Developing Tray* and so on. Whatever is selected, all primary schools are recommended to seriously consider building up a 'toolbox' of five or six such programs, spreading expertise among all the staff and concentrating at this stage on developing the application of at least one of them throughout the school. However, such powerful and flexible software tools are neither cheap nor easy to gain expertise in, and the booklet again makes a plea for necessary financial and vitally important in-service support. (5.2).

All with one micro?

The increasing realisation (or, indeed, evidence) that one micro between many is likely to result in its superficial and fragmented use, prompts a recommendation in the final chapter that further systems are essential. At the very least, all primary schools need 'as a minimum, disc drive, a printer and a floor turtle' as well as some control technology for older children (10.2.1). (Indeed, one might wonder if the current DTI offer on software is not rather out of step for many primary schools who really need more hardware as well. Often, the better, more powerful software tends to demand more computer time, not less, meaning fewer opportunities for 'hands-on' experience for the rest of the children.)

ELSE what?

Another striking feature of this booklet is its softly softly approach. Many of the statements and recommendations contain such conditional phrases as 'if micro-computing is seen as important, then . . . ', 'to make effective use of . . . it is necessary to . . . ', 'a planned provision should be made if . . .' and so on. Indeed, the final conclusion (page 38) provides a prime example:

> 'If the potential of the microcomputer in the primary school is to be fully realised by as many teachers as possible then continued interest and support from LEAs, central government and other agencies will be essential, and will require coherent long term planning'.

All very true and crucially important notwithstanding, but what is missing is the spelling out of the implied 'ELSE . . .'.

'IF the effective use of the micro is to go forward THEN we need resources and planning ELSE it doesn't go forward.'

Presumably it was felt that we can supply our own ideas or that the ELSE part is all so obvious it need not be said. Of course, whether or not this approach will 'catchee monkey' only time will tell. Cynics might need convincing that those with the power to make such decisions are indeed fully aware of the implications. Might it not be that for some decision-makers and purse-string holders, the 'ELSE . . .' does need in fact to be spelt out in no uncertain terms. But perhaps that's being too critical of a document that was only intended to serve as:

> 'a contribution to the continuing debate about the place and purpose of microelectronics in primary schools' (p1).

Whether it achieves that aim depends on its reaching the right quarters. Be that as it may, anyone concerned with primary computing should be very thankful that this document does at least exist and that it frames the whole debate in such a sensible perspective. It is really worth studying very closely indeed, and if you still haven't seen it I would seriously urge you to get hold of a copy. With any luck, it might even provide the very first agenda item for the new MSU to get stuck into, as well. Stranger things have happened.

Barry Wake
Primary Computing Support Team,
Birmingham.

Every LEA and MEP Regional Centre has a copy of this booklet. Contact them for details about how to obtain it.

Software Reviews

Title: **Some more Lessons in Mathematics with a Microcomputer**
Publisher: Association of Teachers of Mathematics, Kings Chambers, Queen St, Derby.
Machine: BBC Acorn B (disc), RML 480Z (disc).
Price: £15

This suite of six programs follows in the footsteps of *Slimwam 1* which was more secondary orientated due to there being more ATM experience in that area. The idea behind them is to provide open-ended programs which can be used with a wide variety of age groups.

The documentation is very well organised with yellow pages for getting you started, blue pages of program details, and white pages describing some lessons with each program. These are not presented as exemplary but show how teachers have used the programs in very different ways with various groups ranging from infants to secondary classes. A short section at the end raises some interesting questions.

Counter quite simply counts. When it starts it is set to count in the usual way. It displays each number on the screen at a fairly sedate pace. The counting can be speeded up, or slowed down, or controlled, solely by the space bar, and the gap between the numbers can be changed by altering the variables STEP and INCREMENT. The starting number can also be varied. Decimals and negative numbers can be used. Two different counting sequences can be displayed simultaneously and you can have the option of sound linked to any combination of the hundreds, tens or units digits too.

An example is given of using *Counters* with top infants when it was linked with percussion instruments to stimulate interest in number patterns. Details are also given of a lively 45-minute discussion it stimulated for a class of eleven year olds. A teacher of thirteen year olds set a problem giving the children two starting numbers, and asking them to find step sizes so that they would, at some time, display the same number. The children were asked to predict what number that would be. Half a dozen additional suggestions are made for its use. *Counters* links the visual with the aural in an unusual and motivating way, and has the potential to provide a variety of numerical experiences through the use of its wide range of options.

In *Digame*, between two and four players take turns at (running a simulation of) throwing a die. On each turn a player may throw the die any number of times, the proviso being that if a 'one' is thrown the accumulated score for that turn is lost. If the player quits before throwing a 'one' the score for that turn is added to a cumulative score. The winner is the first to reach one hundred or more. The program is designed to raise ideas concerned with strategy at a variety of levels involving concepts of randomness, fairness and, later, investigation of the best number of throws to have in order to maximise the chances of winning.

Tilekit allows the creation of tessellations similar to those which might be created with a turtle graphics package. The language is similar but even simpler as a number of different polygons of various sizes are available for immediate use. It is also possible to build looped sequences of commands. The position of the arrow can be changed using several different commands including 'turn slightly' which rotates it 15 degrees and 'move round' which moves the arrow to the beginning of the next line of a shape. The software lends itself to the setting of a variety of challenges, such as the production of tiling patterns, moving certain commands (such as the two mentioned above) around within procedures and observing the effects, constructing rings with various shapes and observing the 'hole' produced and the numbers of different shapes required to form a ring. The general exploration of regular and semi-regular tessellations would also be assisted by this program. As loops cannot be edited the children are sometimes forced to record their work and to work more economically. If used with a group, *Tilekit* introduces the language of shape and geometry and stimulates a lively discussion about outcomes.

Maze is suitable for upper juniors and older children. Mythical and historical connections give it great cross-curricular potential. Mazes can be randomly generated by the micro, or it is possible to opt for the famous Hatfield House or Mollett mazes. These are drawn in perspective. It is also possible to see the plan of the computer generated mazes. Both a map of the maze and the path taken can be printed out. Some interesting problems can be posed from these starting points, for example, can the maze be reconstructed from a record of the path taken? Translating 2D plans to 3D images is a valuable activity, as is linking plans to models. *Maze* could stimulate a wealth of research on the origins of different types of mazes.

After setting the options for the grid, the volume, the timer and the scoring, *Monty* then

displays one of nine possible grids for the time set (0 to 200 seconds). The screen is then cleared and *Monty* (the python?) appears (looking for the numbers that have vanished) and eventually comes to rest when he has found one. The basic task is to work out the other numbers on his body. However, the sample activities lead to the use of the calculator, a discussion about possible shapes for *Monty*, the formulation of rules for number patterns within certain *Monty* shapes on specific grids, the invention of weird number patterns on grids, and finding the minimum number of questions to identify the whereabouts of *Monty*.

Spiro simulates the spirograph and allows the user to create spirograph-type patterns on the screen. The number of teeth on both the inner and outer wheels can be varied. Ample opportunity will be needed for experimentation, but *Spiro* would naturally lead to close observation of the results of altering the variables, and investigations of the patterns obtained, involving the use of factors. Some teachers have successfully linked *Spiro* with the use of the Spirograph itself.

To summarise, this set of programs is an excellent addition to any school's library of problem-solving software. They all prompt the development of strategies, and several should lead to extensive work away from the keyboard. Children will naturally be led towards devising their own methods of record-keeping and notation. The simple starting points will undoubtedly prompt further problem posing, and in making problems on their own, children will develop positive attitudes to mathematics. The authors are well aware that technology is all too often limiting our models of teaching and have striven hard to prove that it has an important role as a springboard for more creative approaches.

Sarah Wells
Manor CP School,
Uckfield, Sussex.

Title: **Flowers of Crystal**
Publisher: 4MATION Educational Resources, 'Linden Lea', Rock Park, Barnstaple, Devon EX32 9AQ
Machine: Acorn BBC B, RML 480Z
Price: £17.65 + VAT, disc, £16.00 + VAT, cassette
Reviewed on: RML 480Z disc (no cassette version for RML 480Z available)

During the last nine months several of the better simulation and adventure programs have begun to arrive for the 480Z. One of the latest in this line is *Flowers of Crystal* from 4MATION, programmed by Staffordshire Educational Computing Centre (*Dragon World* is also available).

The package consists of six parts, the disc, an audio tape, an illustrated booklet, teachers' notes, a map, and examples of worksheets.

The program is intended for use on a 480Z stand-alone machine. There are four parts on the disc. These are the story, the adventure program parts one and two, and a utility program to produce worksheets on a printer. The audio tape contains the story and is intended to be used as a class introduction. The illustrated booklet also includes a copy as a class introduction. The illustrated booklet also includes a copy of the story for further reference. The teacher's notes are very comprehensive. Amongst other things, they include 'Notes for the Busy Teacher' which give a guided tour through the program, an activity which could take many hours of trial and error at the computer. There are also 'Ideas for Workcards' and 'Ideas for Project Work'. Many of the ideas would probably occur to most of the teachers who are likely to use a program of this type, but they are useful nevertheless. There is also a copy of the map (A3 size) which is an integral part of the program, and further copies can be purchased if necessary. The last item of the package is a selection of worksheets which are suggested for recording progress. (These worksheets can also be printed out using the printer option on the disc.)

All in all then this is a comprehensive package for teachers who want to base several weeks' work around an adventure game.

This program is undoubtedly aimed at an older group of children than either *Granny's Garden* or *Dragon World*. It is most suitable for the upper juniors/middle school age range. To succeed with the adventure it is necessary to keep quite detailed records of where you have been, what you were carrying, what difficulties you met, etc.

The program is best used by children in small groups of say two, three or four, with each new move or happening being recorded carefully. After each group has had a couple of sessions a bringing together of the information gained helps progress and at the same time shows that co-operation is necessary for success. The program is in two separate parts but each part is quite complex. It is not possible to save your position in either part, instead you have to start from the beginning using the knowledge you have gained to progress further. There are no passwords, as there are in *Granny's Garden*, so a considerable time is necessary to complete either part even when you know the answers to almost

every problem in the part of the adventure that you are attempting. Either the inclusion of passwords or the division of the program into more sections would have helped the management of the computer and the program in the classroom.

The program follows on well from the story and a lot of discussion is desirable before the program is attempted. The graphics are good but they still leave *scope* for imagination and creative work be it written, spoken or artistic. There are also many more factual topics which can be drawn from within the program on the subject of conservation, plants, or weather for example. There is plenty of work which can be done away from the computer in many different subjects.

Flowers Of Crystal is an exciting and stimulating package for children in the 9 to 13 age range.

Michael Job
Newman College

Materials received for review

Software

Dragon World (RML 480Z)
Box of Treasures (BBC)
4Mation Educational Resources, 'Linden Lea', Rock Park, Barnstaple, Devon EX32 9AQ.

Cars — Maths in Motion(BBC)
Infant Farmer (BBC)
Cambridgeshire Software House, The Town Hall, St Ives, Huntingdon, Cambridgeshire PE17 4AL.

Hunt the Treasure (BBC)
Hilditch Software, 4 Church Rd., Felixstowe, Suffolk IP11 9NF.

Micro Viewdata (BBC)
Tecmedia Ltd., 5 Granby St., Loughborough, Leics LE11 3DU.

Books

Microworlds: Adventures with LOGO, Richard Noss, Clare Smallman, Michael Thorne, £4.95; ISBN 0 09 1611113. Hutchinson Education, Tiptree Book Services Ltd., Tiptree, Colchester, Essex CO5 0SR

MAPE Tape III

The following amendments should be noted:

1. There is a mistake in the documentation. On pages 3 and 4 three references are made to "FirstBt", the file name is, in fact, "FpageX". Please change the name in the documentation from "FirstBt" to "FpageX". Copying and loading will then go smoothly.

2. *Front Page Extra:*
The documentation is ambiguous with respect to saving a page of text in the BBC version. At several stages in the program the page is saved automatically (always under the file name you have given at the start). The correct procedure is to press 'Return' to position the cursor on a new line and then press f0. Pressing 'escape' should have the same effect, but it doesn't because of an error in the program 'FirstP1'. In order to fix this, LOAD "FirstP1" and remove the word REM on line 10. Then SAVE "FirstP1".

3. All RML programs:
The list of programs below shows the relevant line numbers that may need changing if the program is not set up correctly for your printer.

Picture Builder	lines 9000 and 9020
Front Page Extra	line 30
Pattern	line 30
Crackit	line 15550
Mallory	no printer routine
Triple	no printer routine
Makeit	line 4550
Mall	line 16010
Edmal	line 16010

Most of the programs are currently set up for an Epson parallel printer (ie PRINTER 3: PR=1). A serial printer would need to read PRINTER 4,4 (or 4,6 depending on baud rate) and PR=0.

Late MAPE News

Wales Region
Micro-Computer Roadshow,
University of Wales, Cardiff, 5th March 7–9pm
Gwent College of Higher Education, 17th April 7–9pm
Contact Patrick Drewett (address inside back cover) for further details.

News from the National Treasurer

Hello and welcome to 1986 which I hope will be a more prosperous year for teachers than 1985 was. Certainly I anticipate a good year for MAPE. It is the year when membership will top 4000 and approach the magical figure of 5K. Please encourage others to join by passing on the application forms. Membership has increased by 15% over the year and now stands at 3400 worldwide. Fig.1 shows how we have grown in just 4 years. (Yes, I was one of those original members — No. 38 actually.)

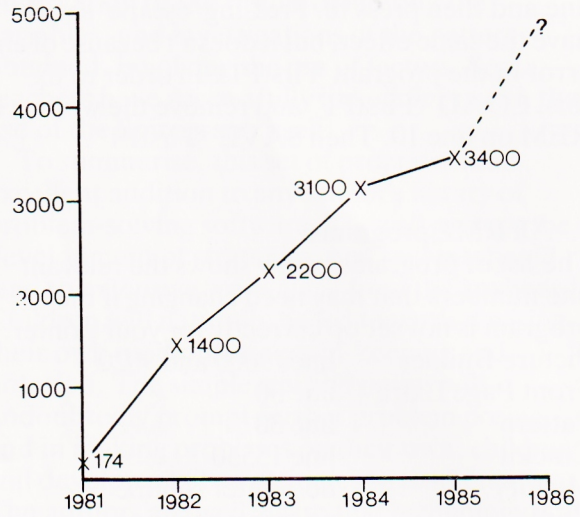
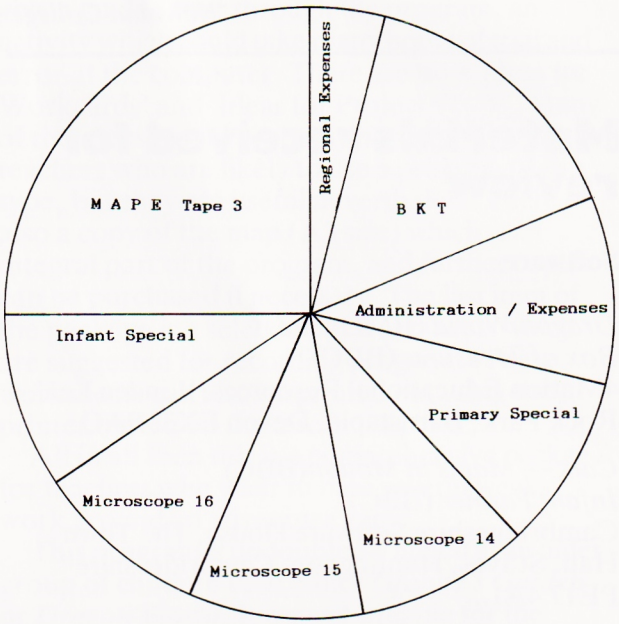


Fig. 1

I am a Warwickshire teacher having served 15 years (of my sentence!) and am still seeking further promotion. My main contribution to computing in my school is knowing where to hit the BBC micro when the keyboard seizes up (long live our two Spectrums) and putting the wheels back on the trolley when they drop off! I have now completed my first year as your treasurer and I have endeavoured to fill Ron's shoes and to keep up his good work. There have been problems and some eye openers. I went to a caviare and wine open evening at our bank in May and discovered how the other half lived. I certainly felt very small in that room full of businessmen. More recently I was asked to visit the bank manager concerning our charges. I was proud of our assets, including £6000 in the current account at the time, but was soon brought down to earth when told that we should be paying substantial charges to them when, in my naivety, I thought they were going to pay me.

You should have received five magazines in 1985 and MAPE Tape 3 during January 1986. This represents excellent value for your subscription. We have actually spent just over £10 per member. Fig.2 shows how your £10 is spent. Our only source of income is normally from your subscriptions but this year MAPE Tapes 1 and 2 were offered under licence to 120 LEAs and over three-quarters have taken up the offer. The profit from this venture will maintain the quality of our service to you during 1986 by offsetting the effects of inflation. Our reserves are well invested and provide a useful additional income.



Publications	-	46%
Mape Tape 3	-	25%
Regional Expenses	-	4%
B K T	-	15%
Administration	-	10%
Cost per member		£10·50

Fig. 2

The main problem of 1985 was the Royal Mail who managed to lose 40 cheques sent by recorded delivery to the Yorkshire Bank. This

system of posting cheques was only a temporary measure to avoid prohibitive bank charges but as a result of this small disaster we changed banks. If anybody knows how to get compensation from the GPO for the resultant extra postage and telephone calls, not to mention time and effort, then please let me know. My letters are now being ignored! If you were one of those whose cheques were lost then please accept my apologies. Although your membership is secure, if you have not sent a replacement cheque we would be grateful if you could send one to BKT.

The biggest headache of the year was direct debiting. Someone at a Council meeting thought that this would be a brilliant idea. So did I while drinking coffee at midnight. After all it saves writing cheques each year. Without going into details about the legal implications and insufficient collateral, suffice it to say that we have more chance of hitting Halley's comet with Giotto controlled by a ZX81 with RAM pack wobble than we have of implementing a direct debit service.

Quite a few members only paid £8.50 for 1985 due to an administrative error at BKT. If you did not send an extra £1.50 then you were given 10 months membership. Contrary to popular belief we have not yet computed a metric year, just given you a pro rata membership. It helps to keep down hefty postage bills if you send cheques on receiving your first renewal notice. My own postage came to nearly £50.

If you have a membership query then contact me and I shall try and sort it out. By the way, please support the activities of your local region, despite teacher 'action', as they cannot fulfill your needs without you.

P.S. Did I really calculate 26, 244 solutions to Children's Competition No. 1 or am I being exceedingly dense as usual? My HI group wanted me to write a program to output all the solutions for them — what faith children have!

Keith Whiting

MAPE News

Report on:—
South-West Region

Simulations Day

This event, held at the college of St Paul and St Mary in Cheltenham, on Saturday 19th October, was, considering the teacher's action, very well attended. Those who did take the time to attend certainly were not disappointed.

The morning session consisted of two seminars, the first by Brian Richardson and Ian 'Chief Constable' Whittington from Cambridgeshire Software House, the second by Mike Matson of 4MATION Educational Resources.

Cambridgeshire Software House demonstrated two programs; *Cars* — whch allows you to control a Grand-Prix racing team and to race at any of about 12 different race circuits around the world, and a *Police Simulation* program which has an underlying crime to be solved. In order to do this you can use recorded statements of eye-witnesses and decide what action should be taken. It also has a facility for '999' calls to interrupt during the day and decisions have to be taken on how best to deal with these.

Mike Matson, as well as finding some very interesting new things that Podd can do, demonstrated *Box of Treasures*. This package comes complete with a beautifully narrated audio tape and follow-up suggestions for the teacher. It is essentially a program in four parts. The first part is intended to act as a stimulus for creative work, the second part is blank and allows you to create your own graphics or posters, the third allows you to create your own box on the screen and the last part lets you plan, create and colour boxes of your own design.

The afternoon session moved us away from the comfort of the Conference Hall, into the very well equipped computer centre. This session was, for me, the most valuable. It was not an organised demonstration session, but rather a time when we could look at, and use, the software demonstrated in the morning sessions. There were ample machines made available to us and the software manufacturers actually trusted us to load, use, and replace their software after use. This meant that we could look at and evaluate the programs for ourselves without the pressure of having a rep breathing down our necks. There was no hard-sell: the manufacturers were happy to answer questions raised, but were equally happy to take a back seat during the session. When, after the session had finished, one of the manufacturers was asked why he hadn't brought along lots of things to sell, he replied that he didn't consider it fair to bring along pricey software to this sort of

meeting and tempt teachers to pay for it out of their own pockets. He said that he would sell just as much by having those same teachers going back to school and saying that they had used this piece of software, and they felt that it was just what they needed in their classrooms.

If only more software manufacturers and course and conference organisers shared the insight of those responsible for this very enjoyable day!

Janice Staines

* * * *

Advance Notice

Joint MAPE/BLUG LOGO workshop.
Saturday 10 May, 9.30–4.30, College of St Paul & St Mary. Write to Reg Eyre, address as back cover, for further details.

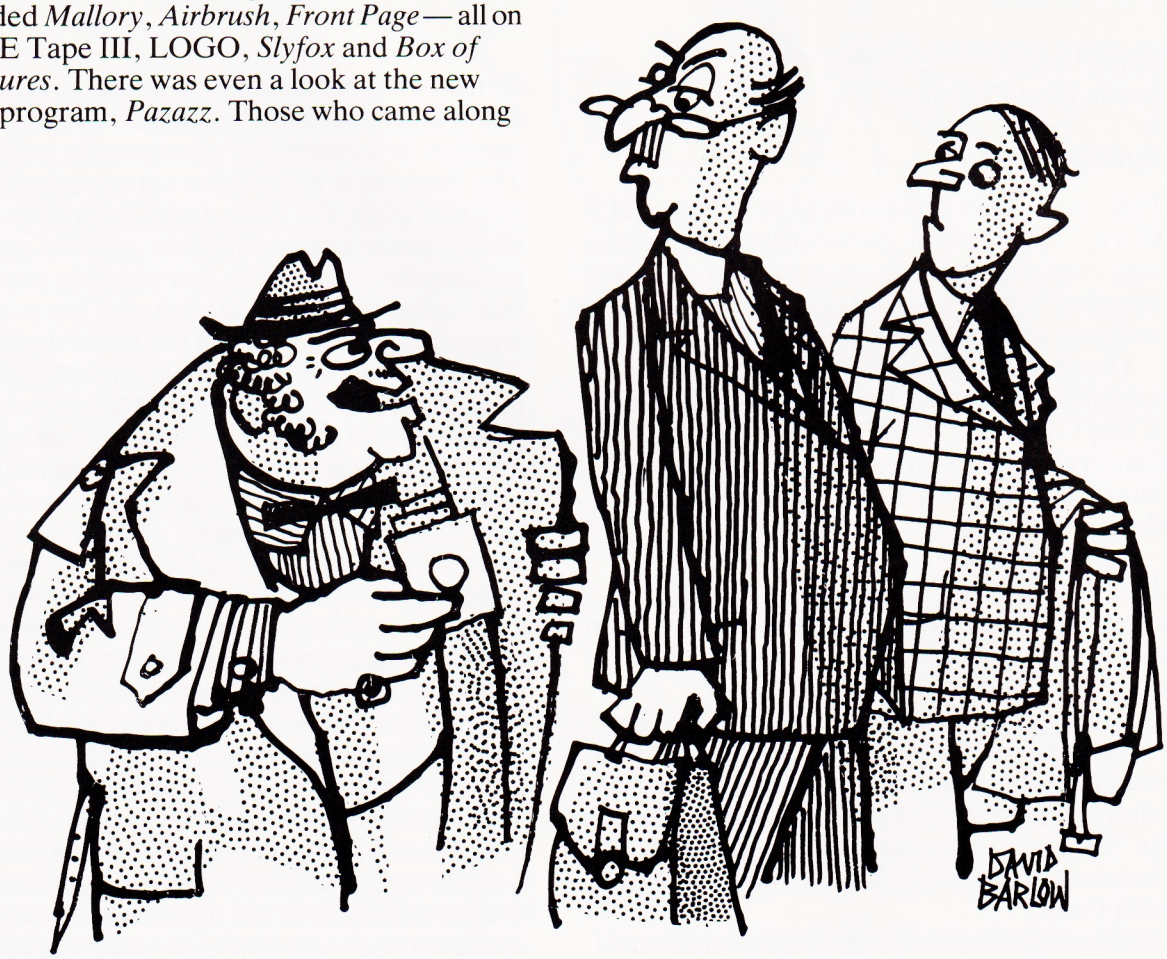
Capital Region

A Cheese and Wine evening was held in Croydon on Thursday 14 November. Di Wailing and I gave a presentation to show how widely available programs, both commmercial and MAPE, could be used as a basis for classroom work on the theme of Christmas. The programs used included *Mallory*, *Airbrush*, *Front Page* — all on MAPE Tape III, LOGO, *Slyfox* and *Box of Treasures*. There was even a look at the new ASK program, *Pazazz*. Those who came along were able to make copies on two discs (BBC and RML), containing not only the datafiles we had demonstrated but also two programs, a wordsearch puzzle generator and a spreadsheet.

The evening was most successful (the buffet and wine excellent) and it is a pity that the attendance was so disappointing. Out of the 270-strong membership we mailed, we received 28 replies with 19 attending on the night. Both Di and I would be interested to hear from members who know of alternative venues to Croydon, nearer Central London perhaps, that would be more accessible to the majority of the Capital membership. Also, if anyone has any suggestions for themes for future events, please let us know.

Finally, members may be interested to learn that a badge-making machine, purchased by MAPE, is currently housed at Croydon. This produces 55mm button badges. It is available for hire by schools, clubs, and societies etc. for fund-raising activities and we can also arrange to make badges on your behalf — the designs either being supplied by you or being drawn by the graphic designer who has recently produced the new MAPE logo and posters. If you would like further details about the 'badger', please contact me at the Davidson Centre in Croydon.

Charles Bake



'You buy very floppy disc?'

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SCOTLAND REGION
To be appointed.

Code 20

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Tel. 0522 754408

Anita Straker, "Mundays"
St Mary Bourne,
Andover, SP11 6KY

Have you booked yet?

The 6th MAPE Annual Conference

This will be held at the All Saints Campus of Manchester Polytechnic from 25 March to 27 March 1986. Further details available from Dave Whitehead, 550 Whitworth Road, Rochdale, Lancs.

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Wellingborough NN8 3UW