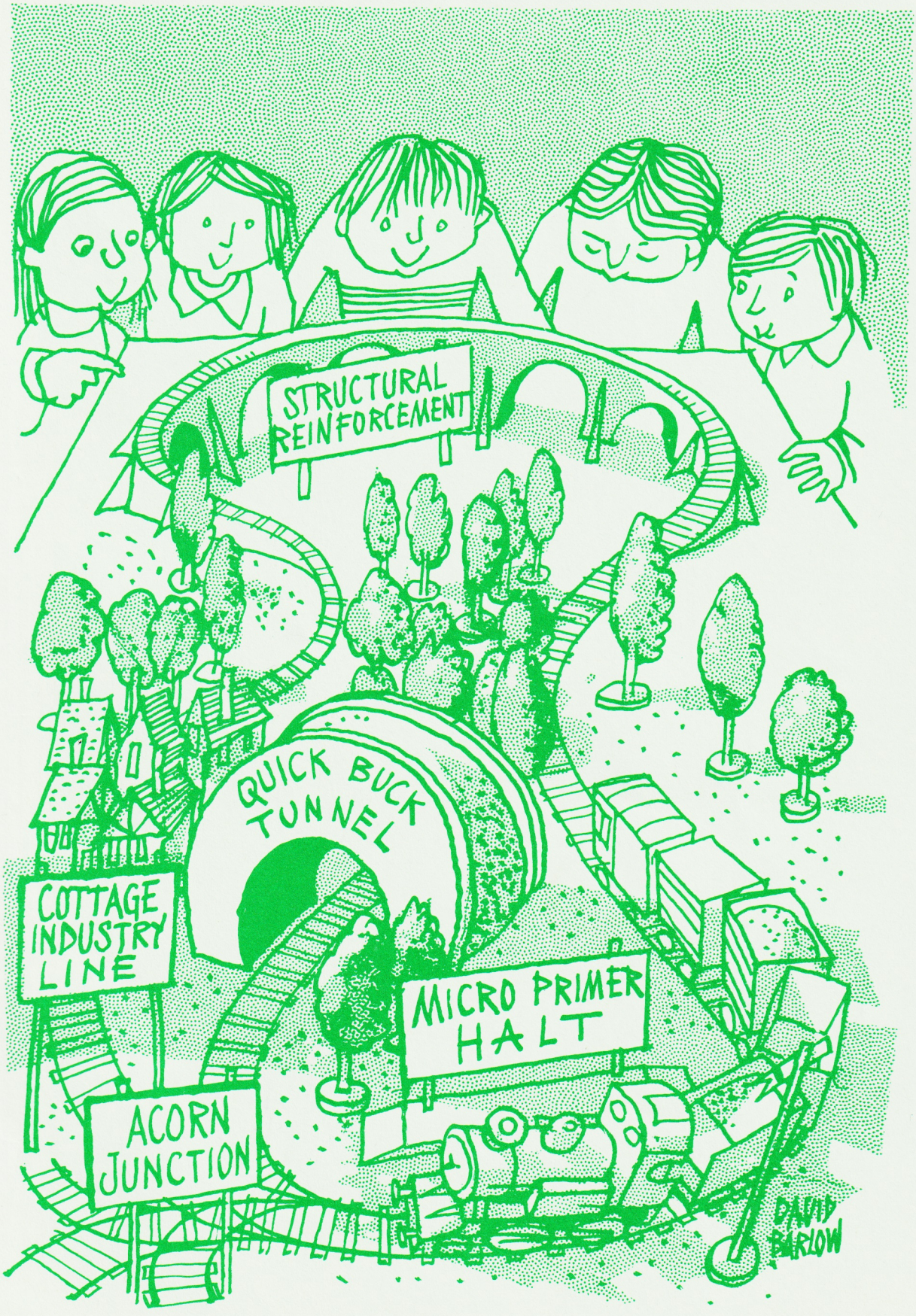
MICRO-SCOPE 9



Newman College with MAPE

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ISBN 0 602 22676 7 ISSN 0264-3847
Sponsored by the Department of Industry

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MAPE (Micros and Primary Education) is open to individuals and institutions.
The current subscription of £7.50 p.a. includes direct mailing of **MICRO-SCOPE**.
Application forms from: Barry Holmes, St Helen's C.P. School, Bluntisham, Cambs.

Reprints
A Compendium of representative articles from **MICRO-SCOPE 1** to **4** is now available.

Individual copies of this (at £3.00), or of current issues, at £1.50 each, from Ginn and Co., Prebendal House, Parson's Fee, Aylesbury, Bucks, HP20 2QZ.

Published by Heinemann Computers in Education Ltd in partnership with Ginn and Company Ltd.

Typeset by Castlefield Press, Northampton.
Printed by Biddles of Guildford.

MICRO-SCOPE 9

Editorial

In the last issue we used the metaphor of setting up a base camp to summon up the prevailing mood. There are new arrivals daily. As machines reach the schools under the DoI subsidy, the expected influx of new MAPE members has begun. It is tempting to move over, relax and make the place comfortable: carpets and curtains for the old LOGO cabin, the tall tales and good fellowship of travellers.

MICRO-SCOPE is content to supply a warm welcome – and cold showers. For this is no victory camp: our efforts so far will not make much sense unless they enable us to go much farther. And if we only wanted a holiday camp, we could have waited for electronic dream palaces to bring it to us. To travel hopefully is better than to arrive. *MICRO-SCOPE*'s attention in the next year will be on the trail once more.

Of course the pioneers ahead will still inspire us. The movement has gained its momentum from the sense of connection to new frontiers. Exotic rituals, mystical incantations and fabulous beasts lie on the mysterious upper slopes.

Some of the routes ahead are already sign-posted. We shall continue to report on new developments in software, now that *Micro Primer* has set respectable standards; on studies to evaluate the use of micros in schools; and on new initiatives in teacher training.

Possibly even more important for MAPE in the next year is the track leading up to base from below. For the pioneers, it was exciting and satisfying despite the difficulties, the lack of equipment and support, the false directions and the boulders in the way. If tens of thousands are to follow, though, we must now make good that narrow rocky path and turn it into a broad, well-lit highway with guides and resting points.

The two-day introductory courses built into the DoI scheme will leave many teachers dissatisfied and searching for help. *MICRO-SCOPE* has recorded the urgent need for substantial extra provision of human resources along with the mere material ones. We hope to document the response of LEAs. We also believe that the growth of vigorous *regional* MAPE activity is crucial to health. Initiatives from the top (DES, DoI, MEP; Inspectors, Advisers, colleges and heads) could become narrow and prescriptive, creating insurmountable resistance, unless they are matched by rapid and thriving development of the grass roots.

At this level, too, the same key issues – evaluation of software and of classroom practice, and the range of in-service training provision – will be central. Nationally, MAPE can act as a communication centre and as a unifying voice: but there is no substitute, especially in the early stages of building confidence, for the face-to-face meetings of teachers sharing common experiences and concerns. MAPE can aim to offer a significant new service locally.

For some, then, our present base is a transit camp on the way up – for others, a work camp whose business is self-education and self-help for teachers.

* * *

Regional groups will no doubt need their own newsletters to announce events. *MICRO-SCOPE* can perhaps best serve for ideas, for reports of exemplary interest and for airing problems and controversies. We urge new readers to contribute.

We are pleased to announce progress on our promised *MICRO-SCOPE Special*. The first of these is devoted to the LOGO language, its current applications and its significance. It will be ready in August, distributed in the usual way to MAPE members and available from Ginn & Co.

This new venture has been generously sponsored by the DoI. We take this opportunity to express our gratitude to Janet Morgan of the DoI – who has now moved on to the Department of Trade, where we wish her luck. Without her imaginative and far-sighted support, *MICRO-SCOPE* would still be a local newsletter.

We welcome back Ron Jones, who was prevailed upon to serve another term as Chairman of MAPE – and so is landed with providing a regular column of news and visions, to our gain. And thanks again to Tony Gray, for the Conference and for helping to collect articles for this issue.

Deadline for articles for *MICRO-SCOPE 10* – 9th September.

MAPE Conference

A view from the bridge

When I agreed to host the 1983 conference, I confess that the enormity of the decision didn't sink in until the next day – fools rush in where angels fear to tread! In the event it proved an enjoyable weekend, even for me: it was good to meet old friends, renew acquaintances and see new faces.

Of course I'm not in a position to comment on the overall success of the conference. The peculiarity of my job is that I only know when things go wrong. However, notwithstanding the two renegades who succeeded in sleeping in the wrong hall (I apologise for being so shirty, gentlemen!); Security locking out the entire delegate body on Saturday night when I had nipped off for a couple of hours' break; the dreaded 'Why haven't we got badges?' controversy (to even the score we'll have them next time and the non-wearers can have their turn to complain); and the almost fatal damage to the timetable caused by the lecture over-run virus; things seemed to go smoothly enough. Mind you, as Carl said to me on Saturday, 'With weather and food like this, the event could be a load of old rubbish and no one would notice!' Perhaps it was and no one did!

Planning a conference is like preparing for a wedding and honeymoon: it takes ages to fix up; you have to deal with a large disparate group of people, many of whom you don't know; you worry in case the accommodation isn't comfortable and you don't know whether it's been successful until it's all over – and then it's too late!

Those of you who stayed the course are to be congratulated on your stamina and stomachs. We were glad to see you. We apologise for anything which we missed and, if we do it again next year, we would welcome constructive suggestions for improvement.

This is particularly important because we are moving to a new and difficult era when the size of our potential conference audience is growing exponentially and the range of expertise widening. Perhaps there is a need to identify even more sharply the 'expert' sessions. I feel that we have a duty to all primary teachers, but the problem of pitching the level of the conference correctly is not going to go away. It may be that the national conference will have to maintain its position in the van of our movement, relying upon regional meetings to introduce our colleagues to the field.

Anyway, whatever and wheresoever the next conference is, I look forward to meeting many of you again and pass on my particular thanks to those of you who didn't ring me at home at 8.00 am to hustle me for a place.

Best wishes,

Tony Gray
Loughborough College of Technology

General impressions

Anyone who came to the Conference for their first experience of micros must have been impressed with their potential after the opening lecture (performance!) by Barry Holmes and Ian Whittington. It set the conference off on the right note with points for experienced and new micro users alike. Using three programs concerned with a search for dinosaurs, a flight simulation and police work they showed how the micro is used for group and class activities across the curriculum. Activities included map work, calculations, decision taking, creative writing, problem solving, analysing evidence . . . one day's use of the police program stimulating two or three weeks' work. Ian's description of this program as dynamic use of a database was a phrase I will remember and use on in-service work with teachers. So at the beginning we were all reminded or made aware of what the Conference was all about. If we had not considered it before, the lecture demonstrated how computer programs need backing up with a wide selection of other resources. I hope suppliers of software took note of this.

1983 — Loughborough University

Tim O'Shea's lecture was in the main more appropriate to an interest group rather than a conference lecture. The syntax, semantics, mechanics and culture of computer languages, such as SMALLTALK, LISP, PROLOG, BASIC, was interesting to those deep into computers but did not mean much to the majority. A plenary lecture on LOGO in the classroom would have been much more to the point.

Norman Longworth's lecture, 'Educating the Information Generation' gave us much food for thought on where the curriculum may be going in the 1980s and very nicely ended the Conference. He criticised computer studies courses, restricted as they mainly are to 'option choices' for selected 14 year olds, and emphasised the need to introduce all children to the changes occurring in society, the processes of information storage and retrieval and the development of thinking and questioning skills. He emphasised his points with reference to employment trends over the last 120 years and the mass of printed information that is swamping us all. Overall, a lecture to set us thinking about the needs of the primary curriculum and an appropriate theme for the journey home and future discussions with colleagues.

The interest groups offered a wealth of interesting topics, but we could only attend three. The comment was repeatedly made that people wished to be in several places at the same time. Without lengthening the conference or having groups meet after dinner the only solution to the problem would seem to be to attend with several colleagues.

Jim Flood's 'Primary Science and the Micro' session was disappointing in that a large amount of time was spent by Jim explaining his philosophy of primary science. Ideal for a DES course on primary science but not for a conference on micros. The specific examples of micro use to control moving vehicles and cranes and to control voice and light activated devices would have benefited from having more time devoted to them.

Although familiar with the *Micro Primer* pack I found Ron Jones's session very valuable. It would have justified a session to the whole Conference. One of his opening comments – that a government was not spending millions of pounds to provide micros in primary schools simply to be electronic blackboards reinforcing the traditional curriculum – was very pertinent. The *Primer* pack attempts to build the new skills on traditional ones. This is intentional as we have a teaching profession trained mainly in the traditional skills. Our pupils will need technical literacy and dexterity, will need to think and express themselves clearly and in the information age will need to access information from databases. So to the 'Three Rs' the pack is adding skills of simulation, problem structuring and solving and basic commercial skills. With a profession that is rapidly having to master the new technologies, he promised us, in the not too distant future, another *Micro Primer* pack on control technology for the primary sector. The mind shudders at the in-service work needed for this new venture before the first round has been completed.

Mark Cooper's session on LOGO, floor and screen turtles was challenging. The fact that junior children who had used the screen turtle for twelve months were unimpressed with the floor turtle when it arrived was fascinating. They could do far more complicated and interesting things on the screen. The floor turtle was introduced to infants with worries that they would not be able to cope with the technology. How we underestimate our children! It was a great success and the floor turtle proved a valuable intermediate stage between self and the more abstract screen. More significant was the way LOGO techniques were transferred by the children from the screen and from the floor into other areas of the curriculum. The use of LOGO in the school had resulted in improvements in:

(a) social development of children;
(b) teachers' willingness to use a range of equipment;
(c) mathematical skills;
(d) gymnastic skills – tremendous improvement.

The 'fringe' sessions were marvellous and I personally had my eyes and mind opened to the value of adventure games with Bob Hart's impressive demonstration of The Tombs of Arkenstone. It will surely not be too long before it is commercially available.

Socially the conference was everything a national conference should be and long may it continue, so that we can go on meeting and seeing the exciting things that are happening across the country.

Peter Johnston

Two school colleagues

Our school, a Nottinghamshire Junior School, was fortunate to have two members of staff attending this year's MAPE Conference.

Our overall impression was highlighted by the opening lecture by Ian and Barry, for here we saw encompassed in a short period of one and a half hours all that we believed about computers and software in the primary school classroom. What a pity it was such a short part of the conference! How ironic that the one lecture, in our opinion, that need not have ended on time was the only one to come within its brief! We think that the opening summed up our beliefs that if computers are to be a force in the primary classroom then the impetus, ideas and programs must come from inside the schools, from practising teachers.

We split our options so that we did not duplicate our Conference experiences, but we found that it was very difficult to make a firm choice – there was so much that we wanted to see and hear.

So far as we are concerned, these option sessions are the meat of the conference and certainly we would rather have undertaken two more of these rather than sit passively through the lectures on Saturday and Sunday.

In the conference literature many option leaders gave a clear outline of what they intended to do. For the future, such outlines should be asked of everyone so that the expectations of attenders match the inclinations of the option speakers.

It was good to be at a conference with a colleague from the same school, especially when reporting back to other colleagues. We have different backgrounds as far as MAPE is concerned, so what follows is a personal impression from each of us.

As this was my first MAPE Conference and I have been using a computer in school for one term, I came to the Conference hoping I would be able to tune in to others' expertise. I was not disappointed. The sharing of ideas formally and informally was prevalent everywhere. Obviously in the lecture theatre and the interest groups and fringe sessions, but also during coffee and lunch, walking to and from anywhere and around the stands and exhibitions and, of course, in the bar. Listening and talking to other pro-computer educators has helped me in putting my own experiences and ideas into perspective.

I soon realised that there were many who had even less experience of computing than my one term, and so I had my turn as an 'expert'. I only felt out of my depth during Tim O'Shea's high-powered delivery of the pros and cons of different languages, but from the parts that I did understand, I have learned so much I felt it was worth the headache I sustained from overload of new information. I believe this lecture will have long-term benefits and that in one or two years' time much of what he said will have more meaning (I took notes). I brought away with me a reassurance that there are many people interested in using computers not to teach children but to help them to learn.

After responding to an advertisement in the *Times Educational Supplement* in January 1981, I made my way excitedly, but unconfidently, to St Luke's College to enter the arena of Microcomputers and Primary Education. I had no experience in such matters and stood in awe and wonder on the Friday evening in particular, looking and listening to the 'experts' and 'enthusiasts'. I thought of that first evening as I enrolled for this year's MAPE Conference.
I came as a headteacher with 1½ years' thinking and looking behind me and 4 months' experience of computers in school; not to see what a computer could do, but to assess the relevance of the software to my school's curriculum; not to stand and marvel at everything I was to see, but to look critically at the way things are going; not to listen and have no opinion, but to listen and express my opinions, to agree and to disagree. I was as involved as I remember those forerunners were involved in 1981.

Stimulated by Friday evening's simulations and late night discussions, I looked forward to the Saturday to enlarge my experiences. I was not disappointed by my choice of options. I was particularly interested in Ann Liddle's approach to the use of computers in her school (for it is so different to mine), and look forward to hearing how her MEP Project progresses. Like all good curriculum development projects one does not have to slavishly follow it to find things of interest for your own school. I feel that the openness that exists in MAPE is so beneficial to the development of the primary curriculum and computers. It was therefore sad that so few teachers were present. The same invitation as I accepted in 1981 is still held open for everyone interested in computers – why not come next year? You will not regret it. Perhaps we will see you there, for we hope to return in 1984 with more experience, more ideas, relevant software and as much enthusiasm.

Janice McQueen and John G. Wilson
Eastwood Brookhill Leys Junior School, Nottingham

HELP!!

'Suddenly there's a whole lot more I know nothing about.' No apology is made for quoting, or mis-quoting, Norman Longworth's closing lecture at the MAPE Annual Conference. As a teacher in a first school about to take the first tentative steps in using computers in the classroom, I've returned from the conference fairly stunned by the amount I need to learn but convinced that, used intelligently, computers could help towards an educational Utopia.

The revelation started on Friday evening with Ian Whittington and Barry Holmes giving an account of a flight simulator. Inside a cockpit – or 'Wendy house for juniors' – pupils use a computer to solve the kind of problems encountered by pilots in real life. They have to use map references, work out speeds and distances, check fuel consumption, carry out difficult missions and land without crashing. The project encouraged all the problem-solving, co-operation, clear, logical thought and exact expressive language any up-to-date teacher could desire. When the pupils are not being pilots, they impersonate police officers using computerised records to help eliminate the underworld of Great Gidding. They have tape recorded 'interviews' and assess and evaluate the spoken word. The skills of reporting clearly and precisely are added to problem solving techniques.

First thing on Saturday morning a group of us played with Bigtraks under the direction of Peter Stevens. Here I was on familiar ground and found it a simple matter to adapt and modify the tasks set to accommodate my five year olds. Peter provided a record sheet so simple that even the youngest child could use it to record programs and check errors. This session built up my confidence, and Ian Whittington had fired my enthusiasm. All was well – until Tim O'Shea's IBM lecture on 'Programming Languages in Primary Education'. The struggle for comprehension sent me chastened and silent to lunch, afraid to comment lest my ignorance should show.

The meal, like all the meals that weekend, was excellent, and thus fortified I went to hear Rosemary Frazer from ITMA on 'Micros in the curriculum'. Here we were introduced to some teaching packs consisting of five modules published by Longmans which can be used as an in-service course or as a teaching resource for primary schools. The programs, covering such things as spelling and maths, could be used in a variety of ways. This session was easy to understand and useful, but my early enthusiasm remained in abeyance.

The Fringe exhibition was varied and stimulating; unfortunately time was too short to see all. I managed to see Stephen Pearson's program *Walk* designed for infants and being sponsored by MEP and felt I would want to buy it. It was simple and unambiguous with well-designed work-sheets using large, clear drawings and print. It introduced young children to the idea and purpose of a plan and encouraged spatial awareness in settings with which most children are familiar, i.e. a garden or a living room. The only instructions required are forward 'F'; backward 'B'; right 'R'; and left 'L'. This seems to be a simple progression from using the directional arrows on Bigtrak.

My enthusiasm was revived by Bob Hart's adventure game *The Tombs of Arkenstone*. The game is designed for 9+ children and is in the form of an open-ended story in which the reader controls the events. There are plans of the tombs on which the children can mark where various adventures occur. The text is full of excitement and gives full reign to fantasy and imagination containing magic, dragons, hobgoblins, touch stones, extrasensory perception – in fact everything to stimulate the most reluctant reader. Here there can be no mechanical decoding: complete comprehension is essential or the game cannot be played. The thrill of controlling the exciting events in this story might well stimulate the players to do creative writing or fantastic art work. Unfortunately, at the time of the conference, no moves had been made for its commercial production.

On Sunday morning, Bill Bailey demonstrated a new electronic toy costing about £50 by Electroplay called 'My Talking Computer'. The diction was fairly clear and not too Dalek-like. There is a variety of programs using overlay keyboards. It is designed for home use for three to seven year olds but some of the programs could have a place in the infant classroom. I could see some possibilities for use when teaching English as a second language, particularly with the programs for picture recognition, word recognition and the early reading activities. The machine is infinitely patient, pointing out when the child is wrong and giving opportunities to try again. There were some number activities, but I felt uneasy about the conceptual gymnastics some of these programs demanded. For instance, immediately after being required to recognise in order the numerals to twenty, the child was asked to solve seventeen minus three. However, there was one ingenious mathematical device by way of a plastic clock incorporated into the machine which will teach time either as 'a quarter to two' or as 'one forty five', etc.

Bill Bailey also gave us a demonstration of a page from a 'talking book' using the BBC model B micro and stereophonic sound. A 'real' voice

read the story as a cursor pointed to the text. This is a project currently being developed by the London Institute of Education. It was pointed out, however, that this project did not appear to be as advanced as the one demonstrated by Allen Carter in the Fringe Exhibition. I did not see this, but apparently the device needs no knowledge of programming language. The teacher's voice accompanies the visual display by means of a dual-track stereo tape deck. The speed of the cursor can be varied as required. Allan Carter's project is being developed at Nene College, Northampton.

The weekend ended with Norman Longworth's BP Lecture 'Educating the Information Generation'. He emphasised the rate of change in the world of technology and pointed out how this change affected the whole of our life today and stressed the implications in this for the school curriculum. Of course he is right, but many non-technically minded teachers like myself need help to make changes of the right kind with confidence, and it is reassuring to know that the services of MAPE exist as we feel our way more tentatively than our pupils who were born into this new and exciting age.

Carole May
Cranfield V.C. Lower School

One year on

A lot has happened since Exeter 1982, both nationally and personally. At the national level, we now have the Department of Industry's offer to put a microcomputer into every primary school at a well subsidised price, and *Micro Primer* – a distance learning pack which has set new standards in program documentation and presentation, and provides a superb book of readings and study guide. Such high quality in such a short time scale is remarkable. At Exeter we were speculating on which machine (singular!) the Department of Industry would back and I was keeping my fingers crossed that it would be the BBC Computer – which I had paid for in January and had to wait until July to receive. Bob Hart (a Hertfordshire Headteacher) was the only person I knew there. We were both absolute beginners and felt a little bewildered – this year we were both involved in the proceedings – Bob, demonstrating his adventure game 'The Tombs of Arkenstone' (which had kept us up until 2.00 am a few weeks before – really gripping stuff!), and I demonstrating 'My Talking Computer' – product of a British firm 'Electroplay', aimed at the 3 to 7 age range, to be on the market around July.

Loughborough was really an opportunity to meet old friends and to make new ones. Barry Holmes and Ian Whittington had been speakers at an in-service course I had organised at London University's Institute of Education, and had talked only a few weeks before on *Mary Rose, Saqqara*, etc, so I was truly amazed by their Friday night presentation. They seem to generate professionally polished simulations faster than most primary teachers produce 'topics'!

The flight simulation program made you want to try it yourself, never mind letting the children near it! Their Dinosaur jigsaw puzzle idea looks really promising – and as for their Police File, well, a lady next to me was really shocked, not by the computer, nor by Barry Holmes. She exclaimed, 'He really is taking his trousers off!' If it had not been for the fact that it all took place behind a screen, and she had therefore made this inference merely by seeing a pair of socks, no doubt the police inspector who finally emerged could have arrested himself for indecent exposure!

Ian Whittington looked more than convincing in police uniform and there was a moment when we half believed that he had really mislaid the key to the handcuffs that were finally locked on Barry's wrists . . . when the computer tracked him down as the arch-villain.

As much, if not more, takes place outside the official sessions at such a conference; like at 2.30 am on Saturday morning I was playing with a program called Rocky's Boots on somebody's Apple. Good intentions of an early night on Saturday went the same way! I had promised some friends who had booked to go elsewhere on Sunday morning that I would show them the 'Talking Computer' on Saturday evening. This then became a 'dress rehearsal' that lasted until 1.30 am!

The trouble is of course that one wants to see everything. There is too much and choosing means you have to miss out on some things. I think we all left with our heads buzzing with new ideas and things to digest later. But then, that is what it is all for. The worst thing is having to wait another year for the next one!

C. W. Bailey

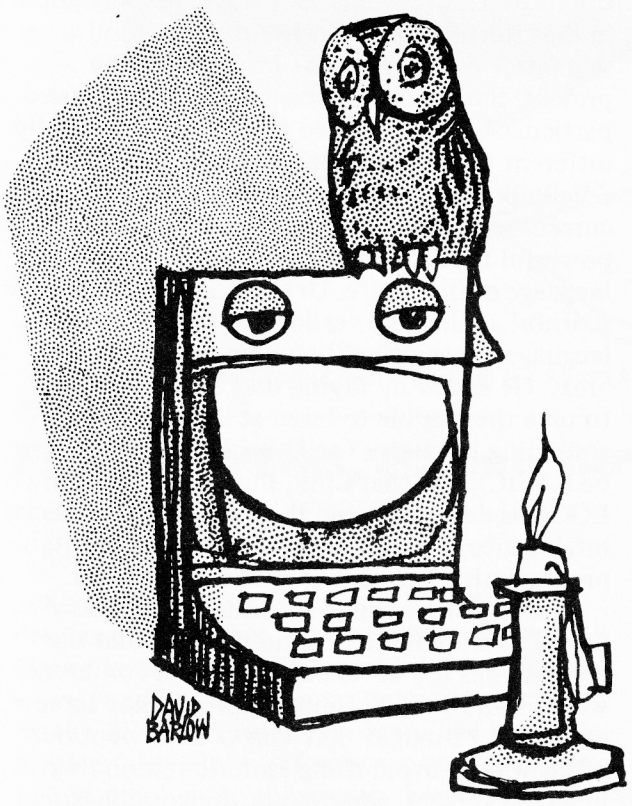
Advances on three fronts

In years to come, 1983 will be viewed as having been a truly pivotal twelve months in primary education. With the sudden advent of a micro-computer in every primary school, massive and unforeseen demands are being placed upon embryonic support resources.

Software availability over the next few months will prove critical to the development and future direction of primary computing. Three main types of software seem now to be emerging, each with a sound underlying educational base, and each of these areas was amply mirrored at this year's MAPE conference.

Simulations

There is an increasing number of good simulation programs becoming available, which when used with imagination and sensitivity can tremendously enrich and extend the learning experience offered by primary schools. Once again, Barry 'It's a fair cop' Holmes and Ian 'Hello, hello, what's all this then' Whittington demonstrated all that is best in primary simulation programs, with their customary 'over the top' presentation. And how refreshing to see imaginative material being prepared for infants to use on a micro.



Terms explained: A dedicated machine

Information handling and retrieval

Norman Longworth's IBM Lecture can have left no one doubting the vital part information handling and retrieval programs should soon play in all primary schools. The prospect of young children assembling their own database and extracting information from it in order to check the validity of their own hypotheses is fast becoming a possibility in many schools.

Programming languages

In his BP Lecture, Tim O'Shea presented an interesting and convincing analysis of the three major computer languages likely to find a place in junior schools.

Programming languages are now becoming available which will enable quite young children to exercise real control over a computer, experience 'process' in mathematics, and enter a realm of problem solving where they themselves can be the masters. This, I feel, extends to us the most exciting opportunity in primary education for decades.

Which (x, x is quirky and inaccessible).

Most of the delegates I talked to at the conference felt there would be no widespread teaching of BASIC to young children. In my experience, many primary children and primary teachers find it quirky and inaccessible, which it is!

Which (x,x is promising but undeveloped).

Prolog may be suitable for use with brighter top juniors, but then only in a database handling context. It certainly has no place with infants or lower juniors in its current form.

Which (x, x is the ideal language for young children).

LOGO seems to be the natural choice. It is a programming language which is accessible enough for a five year old to use, yet is complex enough to challenge adults with its list-handling capabilities. Surely this must be the philosophically 'right' language for most primary teachers and primary children to learn.

Which (x, x is real LOGO).

The current problem seems to lie in getting hold of a proper LOGO implementation. Some of the horrific pseudo-BASIC versions currently being rushed out by avaricious publishers are painfully slow, exhibit reprehensible syntax, employ no local variables and have no list-handling capabilities. Only three proper LOGO implementations are currently available: those for Apple, Texas Instruments and Tandy.

Which (x, x dominates next year).

Perhaps next year, when MIT LOGO is available for the three DoI machines, we will witness the 'LOGO explosion'. Also it must be logical to assume Prolog will be much in evidence at next year's conference. See you there!

Julian Pixton
Walsall

The IBM Lecture

When I was asked to write this view of the IBM Lecture, delivered this year by Dr Tim O'Shea, I thought it might prove difficult. For as well as being a user of a microcomputer in school these past three years, I also have a particular interest in the LOGO computing language, and especially in the philosophy of computer use in education which underlies it. At first I thought that my enthusiasm for LOGO might cloud a truer perspective on what Tim O'Shea said – but I don't think that this is the case. I must emphasise, though, that what follows is a personal view, and the controversy which the lecture stirred up means it left most people thinking.

Essentially the lecture was a computer scientist's view of languages and their suitability for learning and for the tasks in education they might be called upon to be used for. Dr O'Shea started by discussing the arguments of why children ought to learn to program computers. He picked out eight main points:

1. Computer programming languages are a medium used in many tasks.
2. They are adaptive to the use to which they are put.
3. Computer programs allow the opportunity to stand back from our own problem-solving.
4. Unlike books, which are fine for describing facts, computer programs are extremely good at describing processes.
5. Computer programs provide a means for visualising problems.
6. Computer programs do not automatically have to be used in text form – particularly with the emergence of features like speech synthesis.
7. Using programming languages equips the user with metaphors for describing functions in the real world.
8. It is possible to have a personalised, playful approach to learning.

Dr O'Shea then went on to consider the characteristics of programming languages, and how by analysing them it is possible to pick out reasons why some languages are more suitable for some purposes than others. Essentially there were five points to look at:

1. Syntax – is it simple, expressive? Does it do different things differently? Does it fit with the syntax of mathematics? Is it easy to check? Is it easy to learn?
2. Semantics – What does a program mean? (Comments mean trouble! The readability must be low if comments are needed.) How much ambiguity is there? Are the error messages friendly and helpful? Are nice modes available?
3. Mechanism – Can it be easily explained how a program works? (There was some discussion within the lecture of this.)
4. Culture – What are programs written for? Is the language mainly technological, scientific or psychological?
5. Practicality – How available is it? Can textbooks or work-sheets be obtained? What is it good for expressing? What is its response time? What are its storage needs?

Next Dr O'Shea went on to discuss the features of four programming languages – BASIC, Prolog, LOGO, and Smalltalk. The only favourable things said of BASIC were its ready availability and ease of learning. Against it were inconsistencies of syntax, and semantics which Tim O'Shea suggested were 'American' in the worst sense and could be bad for your head. He suggested that BASIC, together with the 8-bit microcomputer, might be a transitional feature of the computing landscape. Prolog he thought was a good language for managing data, but was crippled by a difficult system for the user to master. LOGO, on the other hand, was not well suited to handling data, but was especially good in that it had highly consistent syntax and semantics – it offered the best bet for the present. Smalltalk was very powerful, possessed particularly sophisticated graphics, was radically different to other languages. The problem with Smalltalk was it was not available and most current microcomputers were not sufficiently powerful to run it. It might, though, be the language of the future. Dr O'Shea was particularly scornful about fake versions of the different languages, suggesting they represented sterile areas. He ended by saying that everyone ought to take the trouble to learn at least two programming languages (neither of which should be BASIC), and that LISP, the source from which LOGO is developed and the language of artificial intelligence, would be one of the most profitable programming languages anyone could learn.

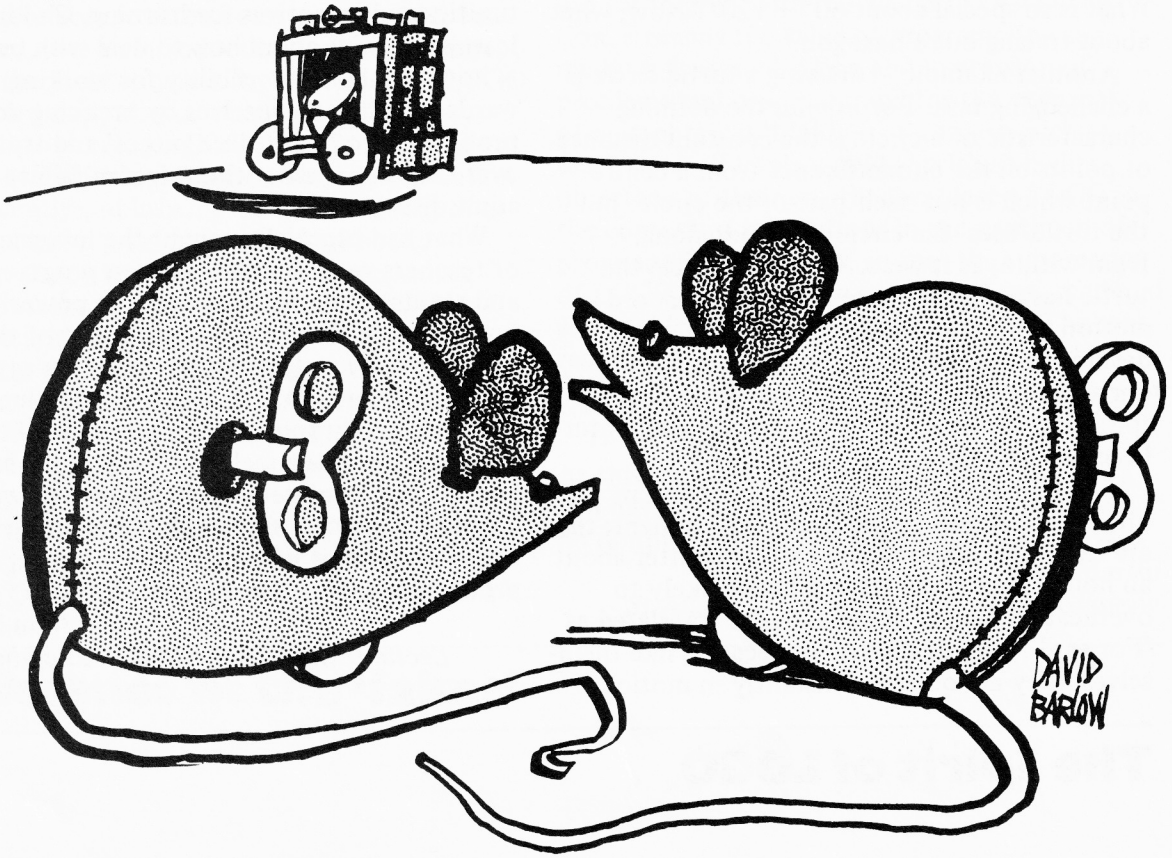
The responses which I heard among fellow delegates were mixed. Some thought that the content was too advanced for such a conference, where some were beginners. I would not agree with this: I thought that Tim O'Shea went out of his way to avoid using esoteric terminology in a vital subject, where to do so would have been very easy. Others thought the subject, as distinct from its treatment, inappropriate –

again I would disagree. I would suggest otherwise it would be a bit like discussing the place of the English novel in school, without deciding whether it should be written in English, Chinese or Swahili. Another criticism I heard was that the lecture exemplified the gulf that existed between the practitioner and the theorist. With this I would generally disagree, for unlike many preoccupied with academic considerations, Tim O'Shea was very positive, even prescriptive, about what he thought we as educationists ought to be doing. Where I felt this criticism might be valid was over his argument in favour of prefix notation (e.g. + 5 4, instead of infix 5 + 4). He developed a strong argument on the grounds of consistency for this, but I cannot help believing that, in an environment where children see the infix version in their arithmetic, the prefix version will prove confusing. But time will tell!

In conclusion I am very glad that Tim O'Shea was able, at such short notice, to come and deliver what I see as a fundamental and stimulating lecture. I am particularly pleased that his lecture added more momentum to the movement to get LOGO quickly and widely used in our schools, and that he forcefully and unequivocally warned against the danger of imitations. I believe he did our conference and organisation a great service with his lecture.

Derek Radburn
Teacher and Chairman, British LOGO User Group

The BBC Buggy: an evolutionary view



'When it comes to tormenting the cat, I think it's a dead loss!'

Floor turtles, screen turtles

Schools seem never big enough to contain the dreams of educators. Most of the audience for Mark Cooper's session had read Papert's *Mindstorms* and had seen the razzmatazz made of it by the BBC Horizon programme. The message seemed fairly clear – if pupils made use of the new technology to think with they could think so effectively and so independently that they would call into question all the arrangements we have made to educate them.

The bearded prophet, with eyes firmly set on the future – 'this is just the first of a whole series of machines to think with, the others have not yet been invented' – was fine in an inspirational way but what of here and now? What did someone who had been working in the classroom with some of Papert's ideas and machines think it added up to?

Mark Cooper was a quiet unemphatic young man, with little of the revolutionary in his manner, teaching in the Wormwood Scrubs part of London. His school was one of those used in the BBC film and he had had more time than most to think about floor turtles and screen turtles as an introduction to the computer language, LOGO.

How did children in his school use these little robots to think? First a demonstration – straightforward, to the point – this is how children first learn to communicate with the machine; single instructions are built up into procedures. Procedures can be repeated, reversed, varied infinitely. Yes, but how about thinking? Example – in order to trace out a path that makes an equilateral triangle children have to think about making a 120° turn to make each 60° angle. What is so special about 60° + 120°? Now, what about tracing out a hexagon?

Another example – drawing a turtle circle is a challenging task. For Euclid, the defining characteristic of a circle is the constant distance of points on the circumference from a centre point which is not itself part of the circle: but the turtle 'sees' the circle as it goes along, from within, as it were. To draw a circle the turtle has to be instructed to relate forward motion to turn and to keep repeating. Having developed the concept of constant curvature one can then go on to think about drawing a spiral and see how a notion of variable curvature becomes necessary.

Floor turtles are probably only found in about ten schools in Britain at the moment; they are expensive, about £300 each, and after about an hour of use the interface box is likely to overheat so that all commands are translated as 'Forward'. Infants love them because, like themselves, they are objects constantly in motion. Junior children soon discard them in favour of the screen turtles that are more versatile.

What benefits did Mark Cooper claim from using turtles? The most striking one was the social development of the children who worked always in groups and had to share ideas, to listen and to cooperate on a task. This is especially interesting as one of the most important points made by the recent ORACLE research on primary schools was that children, even when grouped for organisational purposes, rarely worked as a group in the classroom. More well-structured group activities would seem to be one answer to this problem. Other benefits included, as one would expect, greater grasp of mathematical concepts. For instance, the big numbers involved because turtle steps are very small do not cause serious difficulties – just new opportunities and incentives for learning. Children also learn something about how to deal with problems – how to take responsibility for working towards solutions themselves by breaking down problems into 'mind-sized pieces' and trying over and over again without fear of failure and adult disapproval.

What had especially caught the imagination of teachers watching the Horizon programme and reading Papert's book was the powerful invocation of ideas close to the heart of the progressive educator's faith – children as active agents in their own learning, the individualised interactive environment. Perhaps some of this must remain in the realms of possibility but as Mark Cooper pointed out LOGO is a powerful language that is useful for children to learn. They *can* learn it without turtles – but it probably wouldn't be so much fun!

John Mundy
Lecturer (new to the field), Loughborough University of Technology

The Spirit of LOGO

If the number of invocations is anything to go by, the Spirit of LOGO must have attained a fairly high level of manifestation at MAPE '83. The sacred name achieved utterance through the mouths of celebrants on numberless occasions, from major ritual events such as the IBM Lecture through optional rites in side-chapels to the meditations and discussions of devotees and inquirers in moments of leisure.

Taking the moments of leisure first, participants of a LOGO tendency found themselves party to constant discussion on The Two LOGO Questions – 1. where do I get it? and 2. what does it do?

Answers to the first LOGO Question, being largely factual, could be got simply by questioning enough people. Descriptions of the products available and even printed lists of implementations could be obtained, as well as the opinions and experiences of users; and those claiming foreknowledge of the software publishers' intentions could be persuaded over refreshments to lift the lid on things to come. However, because of the rapidly changing pattern of what exists, such knowledge remains provisional. One hopes that full implementations of the LOGO computer language, as developed at MIT under the ægis of Seymour Papert, will remain on the

scene for a few years at least, but other more ephemeral products, offering usually a sampling of turtle graphics, will no doubt melt away as snow in the sun.

Answers to the Second LOGO Question are a bit more difficult, delving as they do into the mysterious world of educational concepts. The inhabitants of this world (or, one should now say, 'micro-world') behave like energetic salmon, constantly escaping from the grasp, leaving you with the impression that a few moments ago you had something very tasty in your hands and all you've got now is a handful of slime and pleasant memories.

The Conference organisers, in their infinite wisdom, had included among the series of optional activities a number claiming LOGO affiliations, and those grappling with The Questions were able to attend one or more of them. Included were an introduction to the floor turtle, surely the most concrete invitation to the LOGO world, a description of a carefully planned attempt to develop a LOGO programme in a school using turtle graphics, and a demonstration of a recently-published package consisting of a turtle graphics program and a workbook.

Attendance at these events provided some useful information apropos the First LOGO Question, in showing something of what is currently available. The concentration on Turtle graphics was perhaps inevitable, given the present lack of full LOGO implementations on some widely-used microcomputers. Even when these are available, turtle graphics will continue to be an attractive and accessible route into wider LOGO possibilities. In considering the Second LOGO Question, all were agreed that LOGO is a Good Thing, with both mathematical and general intellectual benefits. Proving that LOGO is 'good to think with' is a notoriously difficult business, but the feeling of practising professionals that they have found a powerful tool for their craft should not be seen as insignificant.

The name of IBM conjures up visions of the ultimate; seekers-after-truth were therefore justified in turning to the IBM Lecture for the Ultimate Answers to the LOGO Questions. Devotees longing for a real religious experience were not disappointed, for a prophet had brought down tablets from the Mountains of Knowledge. Part of the text reads:

> Woe unto the false LOGOs!!
> Woe unto the hybrid mutants!!

Denunciation of the heretics aside, the prophet did get to grips with the Second LOGO Question, stressing the value of programming as a medium for visualisation and expression of problems and processes, and for the exercise of metaphorical thinking: all things which teachers at all levels would cherish as higher objectives of their art. He also placed LOGO in the context of its relations in the pantheon of programming languages, so that the suppression of LOGO by something yet greater was rendered acceptable as part of a greater destiny. The text reads:

> MORTUUS EST LOGO: VIVAT SMALLTALK [incorporating LOGO]!

At this moment, however, the Spirit of LOGO still has plenty of mileage on his own, and will no doubt walk abroad at length at MAPE '84.

Allan Martin
St Andrews College of Education, Glasgow

In defence of the 'fakes'

LOGO, it would appear, means different things to different people.

To the purist – the computer scientist – LOGO is a sophisticated, if rather old-fashioned, language for programming.

To primary school teachers, however, LOGO is something entirely different. It is a software tool through which their pupils can learn; not learn to become programmers – there are many in primary education who doubt that this isolating activity is appropriate for young children – but learn many of the skills which have long been at the very heart of primary education.

* Firstly LOGO, as used in the primary classroom, can serve as a focus for teamwork through which pupils may acquire the social skills of co-operation and communication. The Edinburgh study cited by Tim O'Shea has shown this to be one of the main benefits of LOGO activity.
* Next, LOGO allows children to learn to take control of their own learning. New concepts and ideas are introduced to pupils as and when they are ready for them, in response to requests from pupils themselves.
* Through the use of LOGO, children can learn problem solving techniques such as debugging and analysis. LOGO is unique in its power to allow pupils to generate their own problems, which are likely to be far more motivating than those dreamed up elsewhere.

* Using LOGO, pupils can learn many diverse aspects of mathematics. Their activities will inevitably be rich in potential for use of mathematical language, giving pupils a rare opportunity to 'talk maths'. Through discovery and exploration they can find out about space, angle, number, pattern and variables in a natural and powerful way. As Papert argues, LOGO is for teaching children to think mathematically – to be mathematicians – rather than for teaching them about mathematics.

Whatever the arguments for or against teaching pupils to program, there can surely be no dispute over the value of a tool which offers pupils these four benefits. As Norman Longworth pointed out, the current climate of explosive technological change poses teachers the mammoth problem of what should be taught in schools. Communication skills, self directed learning, logical problem solving and certain basic mathematical ideas must be at the core of any consensus on a curriculum for the future.

In theory there is no reason why the two views of LOGO should be mutually exclusive. The four primary objectives outlined above could be met by pupils working with a true, full LOGO language. In practice however full LOGOs are not currently available, are fiendishly expensive, or too complex for young children to use. It is this third point which is most important. In order for LOGO to be a valuable programming tool it must have a very precise structure which allows, for example, distinction between local and global variables. The precision in full LOGO is achieved by the use of syntax and punctuation which is unnecessarily cumbersome for primary pupils. For LOGO to be a valuable tool for learning in the primary school it need not have all the sophistication of full LOGO such as recursion – a concept much too difficult for most children under twelve. It must however be clear and simple, with sets of instructions which are instantly readable and as much like natural English as possible.

This is precisely what most of the 'fake' LOGOs aim for, and some achieve this aim very well. They provide pupils with a software tool for learning the four vital skills. Young children are not expected to learn to play with full sized violins or cricket bats. They are taught using scaled down tools appropriate to their needs. Many of the fake LOGOs fill precisely the same function.

To the computer scientists they may not be LOGO. To primary teachers and pupils – does it really matter?

Heather Govier

'Bighead!'

Telesoftware

The Saturday session on Telesoftware came close to being cancelled. The apparatus had been expected in early January but in fact was not received until 8 days before Conference. Even so, it was not until the third location was tried within the University building that a strong enough TV aerial signal could be found to operate the Adapter. The Adapter is a Field Trial model and some functions are not yet implemented.

The MEP tape/slide programme on Teletext was shown, to start the session. Although the section dealing with Prestel was generally outside the subject of this particular session, it is important to appreciate the differences between the systems, their respective advantages and their disadvantages. The Adapter itself and its connections and controls were dealt with next. A good deal of interest was shown in the arrangement of the chips within the 5 ROM sockets. If the cover and keyboard of the BBC micro are removed, the sockets are clearly seen at the front of the main board on the right. The suggested arrangement, reading from the left is . . . Machine Operating System . . . Disc Filing System . . . Teletext . . . Wordprocessor chip . . . BASIC.

Dealing with the tuning, it was made clear that a strong signal is essential. Intending purchasers are advised to have their aerial system checked. The tuning is very sensitive but it must be said that the manual is very explicit and certainly no-one should find it too difficult to tune . . . subject to adequate signal strength.

Our interest, of course, was in pages 700 to 706 on BBC 1. Five computer programs are currently being broadcast. Each one was called up readily and either RUN or downloaded and saved on to disc. Programs are now preceded in most cases by a page of text about the program. It is best to allow the pages of the program to run through until the first page of the program proper is displayed before typing a SHIFTED/f9 to download the program into memory. The program pages progress once every 15 seconds, though it certainly seemed much longer waiting for them. Though production models will have further facilities, certainly the Field Trial model works very well, is simple to operate and captures the transmitted programs without difficulty. The system is undoubtedly a technical achievement. . . . what then of the programs and the future value of the system to the primary schools?

All 5 programs currently being transmitted were downloaded and RUN. The *Animal* program, part of the *Micro Primer* Pack 1, is well known. Of the other 4 it is doubtful if any primary school will be unduly excited by them. What then of the future? What can we expect to see via the Teletext system? What value is the system likely to have for the primary school? Will a school be able to justify the outlay of a further £200? How many good programs, valuable in terms of good primary practice, could be purchased for such a sum? Is it likely to offer more than just a high speed distribution system? Do the rather vague copyright notes currently transmitted allow a Teachers Centre or an LEA Adviser to capture Teletext programs and distribute them to schools as an Educational Agency? The remainder of the session was taken up with a lively discussion of these and other issues.

We would anticipate:

1. A range of 'quality' programs . . . CAL . . . Simulations . . . Problem solving programs . . . Data handling materials.
2. Computer programs to supplement schools TV programs.
3. Data files of relevance to primary school children.
4. Programs utilising the transient data of Teletext.
5. Opportunity for immediate update of programs and files.
6. A source of 'free' software providing a regular supply of new material.

Some concern was evident about documentation for the programs. Disc system, Econet, Teletext, all eat into available memory. If any documentation required is to be transmitted, even less space is left for the program. If any documentation is to be purchased separately, one might just as well buy the program on cassette also. No-one is in that much of a hurry.

The Primary Telesoftware Project, just launched by the team at Brighton Polytechnic and the BBC in association with some 20 to 30 primary schools, will need to find satisfactory answers to some of these queries if schools are to accept Telesoftware on a large scale. The hope is that the programs transmitted will be of the standard we have come to expect from the BBC. If something like 5 programs are to be transmitted each fortnight, this will soon amount to a very large number of programs . . . can such a very high standard be maintained?

It is an exciting new technology. It has made a good start in that the system is easy to operate for the non-technical classroom teacher. We would all wish the system every success in the future.

Ron Gatfield

The software express

Roger Keeling
Newman College

Most teachers who board the AST (Advanced Software Train) generally commence their journey at Drill and Practice Station. An attempt by Micro East Parish (MEP) to rename the station Structured Reinforcement was over-ruled by the KTBTP (Keep Teaching Behind the Times Party). Even at this stage, some teachers are left on the platform, muttering to themselves about how the biro will be the ruin of handwriting. Others show little inclination to persevere and return to the station singing their newly written anthem, 'Real teachers do it better with pen and paper'.

However, the more open-minded passengers begin to realise the journey is not as hazardous as anticipated (unlike the real APT) – but then comes the Quickbuck Tunnel. This is where most passengers begin to explore several branches in the search for the True Purpose of the Micro (a phrase used by the Maharishi himself, or was it John Lennon?) The distractions include Persuasive Pac-Man, who will trick you into entering the world of monsters, aliens and space invaders. This new drug leads the poor victim into the psychiatric ward of the nearest hospital, waving his joysticks in the air and chanting 'Pac-Man for number 10' (probably just as sensitive as the current occupant).

Then there is the Home Market Line (silver rails and golden sleepers donated by Uncle Clive himself) – only to find we end up back at D & P station; such is the lack of imagination of many of these authors. The third distraction is the Commercial Line (affectionately known as the Cottage Industry Line). This line is peppered with small stations leaping on the bandwagon, and producing inferior software at extortionate prices. I recently took a ride round this line and without any difficulty managed to spend £30 by looking at two programs from each of Acornsoft, ESM and Chalksoft (these are reviewed in detail on pp. 28–30).

An aside: I did hear that most LEA Teachers' Centres would probably buy all software and act as a viewing centre for local teachers. Idea – in a couple of weeks knock together a program that performs some elementary task, just avoids prosecution under the Trades Description Act, and price it at £9.99 (good psychology). Now advertise it to all LEAs and Teachers' Centres and assume sales of 2 per LEA. With a few extra to RICs, colleges and universities, possible sales are about the 250 mark. No-one will recommend buying it – in fact some Centres will be proud of having discovered such a bad program from which they can protect their teachers. Everyone will be satisfied; after all the Centres' task is to purchase both good and bad software. No complaints. Me? Oh! at £9 clear profit I make £2250 for a fortnight's work. Just change the company name and *repeat until* millionaire.

However, back to the journey. For those who have emerged from the tunnel unscathed, the light begins to shine as the Express picks up momentum. Micro-Primer Halt is a major junction through which all lines pass. Passengers now get a feeling for 'sound' software but in terms of demonstrating potential and imagination we have to go further. Past the Sinclair Signalbox, pointing the way to the future, and on to RML Exchange, a fine example of early railway architecture and still going strong. The next stop is Acorn Junction – actually there's nothing there, but plenty of promises that all will be well in 6 months; the maintenance men are geared to move in one week after opening.

If you have survived the journey so far we now find our perseverence is rewarded, and a number of exciting possibilities open up before us. This is perhaps the state of the art at present and it would be amiss of me if I didn't itemise these in more detail.

1. LOGO

One of the most exciting languages in terms of teaching opportunities for young children. *Logo Challenge*[1] and *Logo 2*[2] are poor substitutes for the real thing. *Arrow* and *Dart*[3] are superior versions and drive the floor turtle. Even that doesn't bear comparison against *TI Logo*[4] with the sprites – a complete microworld. RML, BBC/Acorn and Sinclair all promise amazing versions of LOGO on the horizon and are probably well worth waiting for.

2. Simulations

The standard here is improving all the time with Barry Holmes and Ian Whittington setting the pace. Certainly *Mary Rose, Saqquara* and *Treasure Island*[5] are worth viewing to give you a standard to measure against. Also worthy of consideration are *Fox*[6] from Dave Jackson at Newman College and *Siege*[7] from Dave Ellingham at Sheffield – in both cases more for the wealth of information in the resource pack than for the program itself.

3. Information Retrieval

Several good programs are now appearing that enable substantial databases to be built and interrogated; most are an improvement on *Factfile*[8]. *Inform*[9] and *Micro-Query*[3] are more secondary-based, but *PQuery*[10], *Quest*[3] and *Micro-Leep*[11] are certainly suitable for primary applications.

4. Problem-Solving

There are some good short programs useful for developing thinking skills in young children. Generally these are open to abuse if not used correctly, but in the hands of the right teacher children can be stimulated to think and investigate hypotheses in a manner which has not been too common in the past. The best examples in this category are *Eureka, Snook, Ergo, Seek*[12], *Diagramh*[10] or *Animal*[8], *Slyfox*[12] and *Hunt the Thimble*[5].

At this stage the AST may have reached the end of the line, but already the track is being laid for the next academic year and it promises to be every bit as exciting. Prestel and telesoftware will need to be investigated as a means of distributing future software, the BBC Buggy may lead many more primary schools into the field of simple control, and micro-PROLOG promises to give a different angle on databases and logical reasoning. There are also some useful word processing programs in the pipeline that are more user-friendly for primary children.

My real hope for the future will be technology to replace the cassette recorder – if ever anything has been invented to deter the average classroom teacher then this is it. In fact my ideal AST would be an express train running on fuel generated from incinerating tape recorders and C10 cassettes.

References

1. *Logo Challenge* (BBC Model B, Spectrum & 480Z):
   Addison-Wesley Publishers,
   53 Bedford Square,
   London, WC1B 3DZ.
2. *Logo 2* (BBC):
   Computer Concepts, Dept. AC6,
   16 Wayside, Chipperfield,
   Herts, WD4 9JJ.
3. Available from AUCBE:
   Endymion Road, Hatfield,
   Hertfordshire, AL10 8AU.
   Arrow is distributed free to all purchasers of a 480Z under the Dept. of Industry primary scheme. *Dart* is BBC based; *Micro-Query* 380Z; *Quest* 480Z and BBC.
4. TI LOGO involves a memory expansion plus plug-in cartridge to the T199/4A. Details from:
   Texas Instruments Ltd.,
   Manton Lane, Bedford, MK41 7PA.
5. Details of these simulations are available from:
   Ginn & Co. Ltd., Prebendal House,
   Parson's Fee, Aylesbury,
   Bucks, HP20 2QZ.
6. Distribution procedure for *Fox* will appear in *MICRO-SCOPE* 10 (for 480Z users).
7. *Siege* – details from David Ellingham:
   The Holly Resource Centre,
   Holly Street, Sheffield 1.
8. In the *Micro-Primer* pack 1.
9. *Inform* is available from:
   Nottingham Computer Education Centre,
   Eaton Hall International,
   Retford, Nottinghamshire
   (BBC & RML).
10. *PQuery* and *Diagramh* are available from Newman College – for 480Z users.
11. *Micro-Leep* and *Micro-Scan* (RML based)
    Details from John Sherwood:
    ILECC, Bethwin Road,
    London SE5 0PQ.
    Would prefer to licence authorities than deal with individual schools.
12. *Eureka, Snook, Ergo, Seek* and *Slyfox* are all ITMA programs and will be published by:
    Longmans Micro Software,
    Longman Group Resources Unit,
    33–35 Tanner Row, York, YO1 1JP.
    (*Eureka* and *Ergo* are also in the *Micro-Primer* Packs.)

Software evaluation and teaching style

Peter L. Cave
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I read Tony Mullen's article in the last issue of *MICRO-SCOPE* with a great deal of interest; I found the points he made nagging at my mind. It seemed to strike at the heart of the tension that exists between the 'traditional' and 'progressive' approaches to primary education, and to their relationship to the impact of the microprocessor. He touched on many items that all too often fail to be discussed in print.

The strengths and weaknesses of the British educational system are typified in the primary schools; their isolation and individuality have encouraged the changes in pedagogy that have occurred during the period of compulsory education. The absence of an imposed curriculum and concomitant strict supervision has sometimes meant that the dissemination of ideas and practical experience has been fairly slow, at least until relatively recent times. While some establishments may have been slow to make changes, the wholesale adoption of innovation untested

by time has not had any marked deleterious effect. The staff of each school has created its own expectations of behaviour, achievement and relationships that might be termed the culture of the school, and each teacher has developed a teaching style with which he feels confident. Indeed, while HMI indicate that those who use a mainly didactic approach should adopt a range of techniques, they temper this suggestion with advice:

> 'It is not sensible for teachers to attempt to use a teaching technique that is clearly beyond their operational skill and is therefore inefficient . . .'[1]

Investigation as to why the majority of teachers should favour a particular method is beyond the scope of this article and this journal. Most teachers will be aware of the implications of the suggestions.

It is not satisfactory to equate teaching method or style with the curriculum. It is a specious argument to suggest that a didactic style tends to be related to a view of knowledge as fixed; a closer examination should reveal that any method is content free. The teaching approach is the medium through which the curriculum is presented, but the message may well be modulated by the medium. It is the attitude of the teacher to the limits of the material offered that defines curricular spread and the depth to which any item is examined. HMI are satisfied that the curriculum is wide enough for present needs, even though they may not totally approve of the teaching methods.[2] They also suggest that uncontrolled discovery learning is less efficient, and this view is supported by research.[3]

Although diversity of subject matter and approach is given every encouragement by the very nature of the system, British schools seem to be covering more or less the same ground. Strictly speaking, freedom only exists within the boundaries of constraint identified by the individual. All too often the setting of the boundaries is due to circumstances beyond our control. With a wide choice of options the situation is said to be open; with only one option the door to choice is closed. There are many factors which restrict the teacher in his choice of material: the Head, available resources, everything that makes up the school's culture. The over-riding limitations are the experience and intellectual and personal characteristics of the children involved. Every teacher who is sensitive to the needs of the children will be aware of those for whom the freedom of wide choice represents a major threat and who would rather settle down with a nice, secure, closed, escapist storybook.

Adults use their experiences to identify the options available to them, and are sometimes able to extrapolate from this database to create new options and novel solutions. It is said that primary children, with their limited experience and inability to classify a totally new situation, should always be led from the known to the unknown and always, as Piagetian theory suggests, with concrete references available for support. The startling success of LOGO and particularly turtle graphics is due entirely to the limited and easily learned basis of the language. Decisions were made as to which concepts would be identified by children and these were written in at the design stage. The creative part played by children using this language is due to the ability of the child to synthesise from his experience and the potential offered by the LOGO system. Not all children will use the full potential because their experiences will not allow them to recognise the options available. Thus the child who has learned to turn left only will be quite satisfied moving through 270° to go right.

The decision of the child to make the turtle draw a flower or a garden is no more 'real' than the decision to allow an analogue Hammurabi to starve his synthetic population. Both simulations are constrained by the original decision of the programmers to allow the user to perform certain limited functions within the environment of the software. Both allow the testing of hypotheses within a tightly controlled set of variables. This is probably all the vast majority of children can manage. In neither case is it always possible to quantify any learning that has taken place. We are fortunate that the current state-of-the-art microcomputers enable us, for the first time, to prepare such situations.

Turtle graphics, like other computer programs, is a tool designed to do a particular job. It would be unrealistic to use it in an advanced mathematical context when other programs are better suited to that environment. The programs that are available are almost as varied as other tools used by teachers. The wide availability of software covering a particular body of knowledge or range of skills means that a better match is likely to be made between the needs of the child and the program content and approach. To suggest that one type of program is better than another is rather like saying that films or records are better than television. Try asking an ornithologist for his views on a comparison between a book that describes the tones of a song thrush as 'did he do it, did he do it, Judy did' and a sound recording of the same bird.

Consequently, computer programs cannot be forced into a hierarchy as the concept of 'higher' programs subsuming the characteristics of 'lower'

programs is implicit in such a structure. There are merely programs that authors create to be of particular use in a particular way for a particular situation. Some permit a limited response to a stimulus, others are more tolerant (just like children). Some are concerned with exercising a set of facts, others a set of skills, and others are intended to develop attitudes in the nebulous area of the hidden curriculum.

Computers are probably the first innovation to affect the development of the majority of schools in the country within a very short period, Lady Plowden notwithstanding. Little research has been undertaken to assess the quality of the changes that have taken place already where computers have entered schools. Used effectively (and who can say how that is to be?), they could be a Good Thing, but even a GT in ineffective hands can do more harm than good.

No innovation will become a GT unless it, and the school culture, can be adapted so that all changes can be accommodated by the society that maintains the culture. The smaller the impact of the innovation, the more readily an accommodation can be made. Computers and the programs that run on them are no different from any other new teaching tool, and if teachers can lessen the shock of change by identifying trusted virtues, then they are more likely to use the equipment rather than leave it gathering dust with the other failures.

Software will be evaluated using the same criteria that are employed on other media, the most important question being: 'Of all possible methods, is this program the best way of presenting the educational points to be made?' If the program (or even the whole computer-assisted method) fails to provide a satisfactory answer, then it is doomed to redundancy, and rightly so.

There will be teachers who will be quite content to strive for the goals they have set their children, using the computer for nothing but drill and practice. This may underuse the machine but it is not necessarily wrong. But it is to be hoped that, with increasing confidence, many more may experiment with other programs and perhaps become more aware of their teaching style as a whole. Perhaps they may even demand programs that stretch the abilities of the programmers to the full. Whatever paths computing in primary schools takes members of the profession should be trusted to choose and deploy the tools of their craft in the way they feel the most comfortable.

References

1. *Primary Education in England* (HMSO 1978), paragraph 8.16.
2. *ibid*, paragraph 8.67.
3. Gagné, R. M. *The Conditions of Learning* (Holt Rinehart and Winston, 1977), pp. 155–167.

'Just take your time, Madam, and point out the one which made the improper suggestion.'

Software for language development

Helen Smith
Newman College

Great progress has been made during the last twelve months in the development of language software for primary children. Although the range of currently available material is restricted, it is worth looking ahead at the type of software that will soon be accessible to all schools.

Language software in general seems to fall into three categories: practice and reinforcement of basic skills, assistance in writing and the offering of a challenge or creative stimulus. Programs of the first type are undoubtedly the most common. Notably abundant are 'drill and practice' programs dealing with spelling, grammar and punctuation. These areas may easily be tackled by amateur programmers, and the quality of the programs varies enormously. In the worst cases, we sometimes see teachers who would be appalled at the idea of setting children grammar exercises day after day happily allowing children to use 'drill' programs repetitively. Children do not complain because the computer is 'fun' – up to a point. But are they really gaining any more than they would from a routine grammar worksheet?

There is a strong case for using computers for individual reinforcement. You may well find that a program happens to be ideally 'tuned' to a child's particular learning problem. Where children are experiencing learning difficulties, the greater the range of materials you have at your disposal, the better. There is an even stronger case for group work with the micro, as more children benefit, and discussion adds a new dimension. Appropriate, carefully designed material will provide motivation and generate increased confidence. Teachers should be prepared to alter data in these programs to contain their own material. Ideally, programs should be designed to make this as easy as possible to do.

Structured material which follows the child's own development can be very useful. In some programs, the pill is sugared with a 'game' element, which may provide genuine fun and challenge in speed and co-ordination. The danger is in repetitive use. Reject programs which do not accord with your own teaching strategy, and which cannot be adapted to suit your children's needs. Do not feel that the children will benefit because, regardless of the program, they are at least using the computer. It is well worth becoming aware of the open-ended, creative scope that the computer can offer, as an alternative to its restricting, sometimes stifling, 'reinforcement' role.

The second category deals with software intended to aid children in developing writing skills. Word-processing packages come under this heading, such as *Word* (380Z) and *Edword* (BBC) which have been developed for use in secondary schools. There may be a case for using these packages with upper junior children, in certain instances. I have come across a number of ten- and eleven-year-olds who have developed the necessary keyboard skills. Using a word processor means that making a fair copy no longer involves starting from scratch. Errors in the text may be eradicated while writing, or while checking through at a later stage. Ease of editing provides an incentive to check one's work thoroughly, and permits experimentation with different means of expressing a point. A word processor specifically designed for primary children would be a welcome development. Problems may arise over the amount of time individual children would need to spend at the keyboard. A printer would be essential.

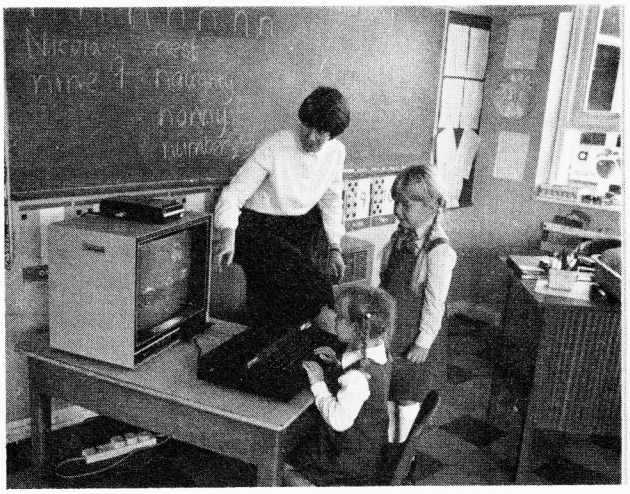
'Writing' programs may, ultimately offer much more than editing and formatting facilities. Programs capable of intelligent analysis of prose have been developed on mainframe computers. Large databases are necessary. Dictionary and thesaurus facilities are present, enabling spelling to be checked and instantly corrected and giving fast access to a list of synonyms for any given word. With developments in miniaturisation, and improvements in the power of the personal micro, such aids to writing will become widely accessible in the future.

In the absence of a word processor for primary children, teachers who wish to experiment at an elementary level with using the micro as a writing tool may like to consider using the program *Clues*. This program, developed by ITMA and published by Longman for the BBC and 480Z, allows teachers to enter a text and 'flag' words which may be coloured, scrambled or replaced by asterisks or by a standard gap when the text is displayed. In entering the text, simple editing facilities are available. The text may be stored on disc or tape, and displayed on the screen or printer using double-height characters. It must be stressed that resemblance to a word processor is at the most elementary level, but the facility is easy to use and the display clear and attractive. I see no reason why the program should not be used for primary children to compile their own texts.

The third category offers to software designers, and teachers, the greatest challenge. Can the micro offer a new learning environment that children themselves are free to explore? Can it serve both as a stimulus and a vehicle for the expression of creative thought? There is currently a great deal of interest in the development of 'Adventure' games as a powerful stimulus to language development. Many people will be familiar with the standard commercial adventure program format. A scene is described; objects, and people, may be present. Directions of possible exits are described. The 'adventurer', with a goal in mind (finding treasure, escaping from the catacombs or merely surviving as long as possible) has to make a decision as to what to do. Communication with the computer usually depends on two-word commands, using a restricted vocabulary: 'get purse', 'follow passage', for example. Adventure games of varying quality and difficulty are available from software houses. Some have been developed for use in secondary schools. At Chelsea College, members of the 'Computers in the Curriculum' project are designing a package which will enable children to develop their own adventure games. Children themselves are responsible for defining the vocabulary to be used and for describing, in graphical language, each scene. Routes through the game, dependent on decisions taken by the players, must be charted. The degree of key-board skill that many primary children have acquired should bring this package within the scope of junior children, when it becomes available.

There are other programs which offer an environment to be explored, encouraging at the same time reasoned decision-making and precise use of language. *Hunt the Thimble*, published by Ginn, is designed for young children. Once the room has been found, the thimble has to be located precisely – it may be near the chair, but is it 'under', 'on' or 'behind'? *Slyfox*, an ITMA program published by Longman, is based on the same idea. However, teachers – or, better still, children themselves – may devise their own scenario. Children work from a sketch of the overall 'arena', and must name the scenes and the objects they contain. Prepositions are entered, which the players searching for the fox must use.

There is no doubt that such activities will appeal strongly to the imaginations of most children, and hence have great motivating potential. In the precise use of language for descriptions and commands, practice in basic skills is gained implicitly. It is unfortunate that such versatile language packages are scarce: the reason is that the development of such a package may take a college team, or group of teachers, up to two years. But it is important to look ahead, and in the right direction. In the meantime, it



is worth looking at what is currently available with an open mind. For example, the newly-published Longman's 'Ladybird' software will be of interest to many teachers. The program *Giant* enables children to build up a word picture of their own imaginary giant. The micro responds with appropriate comments as details are entered; the style is friendly and encouraging. Commercial computer games may be of value – they may also take over! 'Pacman' has been used as a timulus to creative writing, with remarkable results. The skills that children develop in co-ordination, rapid decision-making, designing strategies and interpreting large numbers should not be underestimated.

An MEP Reader, entitled *Exploring English with Microcomputers* and edited by Daniel Chandler, is now available. It is published in association with the National Association for the Teaching of English by the Council for Educational Technology, 3 Devonshire Street, London W1N 2BA. The book contains much material of direct relevance to primary teaching, although it is chiefly oriented towards secondary teachers. It is well worth reading; the scope of current developments in language software will come as a surprise to many.

The photographs show Helen at work in a 'Newman Project' school.

The aims of Micro Primer

Don Walton

Don Walton was responsible for the collection and early development of *Micro Primer* software packs. He is Deputy Head Teacher at Houghton C. P. School, Huntingdon, Cambs.

One year ago *Micro Primer* was just a few ideas on a piece of paper and the machinery which was to be the focus of the project was just struggling into existence. By now many of you will have seen the self tutorial part of the pack and perhaps studied it in depth, but you will not have seen all the software which, when it arrives, will complete the package. Each program is carefully documented, to enable the user to get the most from the software in the initial stages and to suggest extensions. However, there is nothing in *Micro Primer* to explain the overall aims and objectives.

To set the scene, a few words describing the compilation of the software would seem appropriate. An initial trawl was made through the good offices of *MICRO-SCOPE* who inserted our letter asking for specifications for programs. As a result of this advertisement, about thirty individuals sent specifications, ranging from a few notes on a piece of paper to very carefully prepared specifications which, if accepted, could be sent straight to a programmer. In addition to this we were aware of a handful of people who had already done a lot of work experimenting with microcomputers in the primary classroom. We were anxious to see their work and include their ideas if they fitted with the broad aims of the pack.

We wanted to ensure a balance so that the pack would not be biased towards maths or infants or any other particular sector or subject in primary education. In addition it was particularly important that the software should not be seen to be favouring any particular philosophy of education: it is my belief that the computer can support all approaches to education. If the computer is to be the servant of the teacher, then there should be no restrictions caused by biased editing of the software.

In the beginning the software was entered on to a very rough curriculum chart which had four age groups (Lower and Upper Infants, Lower and Upper Juniors) along one axis and subject areas (maths, language skills, logic, etc.) down the other. Of course, this became virtually obsolete when the first line was drawn, as it was apparent that there were to be many more facets to the software than this. The list below indicates the range of approaches, ideas and applications illustrated by the software (it is not a complete list of software available in the pack).

It should be remembered that our main audience was to be children aged five to eleven and teachers who are relatively unsophisticated in the ways of computers and their potential. It was the intention that this pack should be a gentle lead into this new area of learning as well as a useful resource within the classroom.

Title of program	*illustrating:*
Quiz programs, *Animal*	data storage/retrieval
Spanish Main, Shopping, Litter	simulations
Cat & Mouse	small group/ individual program
Eureka	class programs
Vennman, Venn kids	ten minute programs
Spanish Main	a two hour program
Trains	structured reinforcement
Gates	a concept program
Vennman, Venn kids, Shape, Gates	use alongside traditional learning materials
Ergo	a self-contained program
Fraction Snap and *Anagram, Box Clever*	support of traditional curriculum
Spanish Main, Crash	programs which extend the traditional curriculum
Anagram, Shape shoot, shape builder	program designed in the first instance to be diagnostic
Vennman, Venn kids, Shape, Gates	a suite of programs on a particular theme
Fraction Snap, Cat and Mouse	controlling the child's learning behaviour in a narrow sense.
Crash, Spanish Main, Animal	software controlled by the children
Build	some programs are difficult to categorise!

These detailed individual aims are subsumed in the five broad aims of the pack as a whole, as I saw them:

1. To set standards for quality of presentation both on the screen and in packaging and documentation;
2. To raise the user's critical awareness when judging software;
3. To be useful within the classroom for teachers of all philosophical persuasions;
4. To act as a launch pad for further developments in educational software;
5. To illustrate to teacher and child a wide variety of software.

Perhaps this helps put *Micro Primer* into context. The software in historical terms is one year old, a long time in the world of computer hardware development but not so long in software development, which lags far behind. My wish would be to see *Micro Primer* software replaced by a flood of superior material in the next year or two; but I think development will be evolutionary rather than revolutionary. I hope the *Micro Primer* software has been a useful step, a first step for many, in this fascinating new medium for learning.

MAPE matters

Ron Jones
Chairman of MAPE

My turning up again like the proverbial bad penny is something of an embarrassment, expecially after promising in the previous issue of *MICRO-SCOPE* to leave the scene. However, my re-appointment for a further year as Chairman of MAPE will at least give me a chance to help nurture our infant organisation through what could be a critical period.

I thought that *MICRO-SCOPE*'s resident cartoonist David Barlow caught the current mood of MAPE in his cartoon on the cover of issue No. 8, where he depicted the setting up of a base camp. I like the analogy, for indeed it recalled the enormous amount of planning and hard work which has been invested so far to get the expedition on the road, and it offered tempting glimpses for adventurous spirits of the unconquered peaks.

I feel that this next year is a vital one for MAPE. We must establish a firm base which is well prepared to receive those teachers and interested parents who are just joining our organisation – for they will need a good deal of help, advice and support if they are to make positive contributions to the use of micros in our classrooms. We also have to support those teachers who possess a strong spirit of adventure and wish to climb those distant peaks, and yet keep open the tenuous line of communication with the base camp. Our regional organisation may play a vital role – for who knows where the exploration will lead? There is certainly an exciting, yet challenging, year ahead of us.

This feeling of excitement of the unknown, based upon the confidence gained from two years of experience as an organisation, was reflected throughout Conference '83. I must take the opportunity provided by this column to record on behalf of all those attending our thanks to the Conference Organiser, Tony Gray of Loughborough University, and to his efficient and pleasant staff. My thanks also extend to members of MAPE's East Midlands Regional panel for their hard work. No tribute would be complete without a mention for our 'star turns' of the opening night – how we will ever match it next year I shudder to think! MAPE's Secretary Barry Holmes and his close collaborator Ian Whittington really gave us a marvellous introduction and an interesting slant on the use of simulations!

The two key lectures pointed us towards the future, hinting strongly as to the routeway we should begin to follow. Tim O'Shea's IBM Lecture, which covered so much ground on programming languages, sent shivers down my spine when I read of the number of publishers promoting elementary programming courses for young children. These courses, based on work-cards, hide under the banner of 'Problem-Solving'. The last thing we need in the primary school sector is a watered-down version of the GCE O level syllabus in Computer Studies. Personally I cannot think of anything worse, and I do hope that teachers will resist this influence. We need a much broader 'across the curriculum' approach which will include new skills as developed by Norman Longworth in his excellent and thought-provoking BP Lecture.

Sometimes at conferences you wish that you could divide yourself into several parts, to attend as many activities and workshops as possible. This was especially so at this year's MAPE Conference where so many tempting options were on offer. Unfortunately I was able to attend only three sessions; these I found stimulating and challenging in completely different ways. The session by John Smith of Loughborough University on using the micro for control raised many interesting challenges – some of which I hope to be able to take up

when we begin work on developing a package for primary schools based on Control Technology. This work is currently being planned as a joint venture with the National Centre for School Technology at the Trent Poly by DoI and MEP – but more of that in a later issue of *MICRO-SCOPE* when the primary teachers involved will perhaps give us an interim progress report. John Smith based a good deal of his session on using a very simple interface board to drive a very large plastic crane – it stood well over a metre high, and cost under £20.00. It opens up all sorts of possibilities when used with primary children.

I also spent a fascinating hour as an urban fox! I could hardly believe the experience, for within five minutes of the start I, with forty other people in the room, experienced through a very clever simulation the trials and tribulations of a fox living on the outskirts of a city. It involved using all my faculties to search for food and water and survive the many hazards. This powerful simulation has come from Newman College. The program, which is still being developed, and the beautifully produced support material points to all kinds of possibilities for the extended use of the microcomputer. It would, for example, provide an excellent vehicle for the World Wildlife Foundation, as different versions could easily be made on the lives of endangered species. The program really stimulated my thinking processes. It also showed the importance of encouraging 'fringe' events at the Conference.

. The third session, on data-handling, involved the use of the micro with top junior children in social studies. Alistair Ross showed us just what the children in his class were capable of achieving using high technology as a tool. It was obvious that the children responded well to an imaginative teacher, thoroughly at home with the technology, so that they were able to use it in a creative way. I was struck with the stark contrast between the comparative drabness of the information retrieval package being used and the software developed by Alistair himself where he wanted to highlight certain features through the clever use of coloured graphics. It was the result of a classroom teacher recognising a need within his own class of children, and doing something about meeting the need. Many other Conference members I am sure enjoyed similar experiences in many of the option sessions.

Comparing the work being pioneered at Exeter two years ago with the uses on show at Loughborough '83 serves to illustrate the rapid rate of progress being made in the use of the micro in primary schools. MAPE must ensure that these examples of good practice are brought to the notice of as many primary school teachers as is possible, especially now that the DoI/DES Micros in Primary Schools Scheme is well under way in most Local Authorities. As that scheme, admirable as it is, begins to take effect, we must continue to pressure Government and LEAs for more support and provision, if the momentum is to be maintained. This I feel will be another important task for MAPE to undertake during this coming year. One computer per school is just the start, enough to whet the appetite: it is obvious that more than one is needed. In many small schools this extra provision goes beyond self-help. The provision of disc drives would be a step in the right direction. It would bring the DoI package up to the standard provided in secondary and special schools, and would also enable the use of information handling packages to be extended. *Quest*, produced by AUCBE at Hatfield under Dr Bill Tagg, and INFOM/INFILE, produced by Ken Atkin's team at the Nottingham Computer Education Centre at Eaton Hall International, Retford, are examples of such packages which will enable schools to take this next important step in the use of quite sophisticated yet open-ended databases.

Alistair Ross (who unfortunately for 95% of primary schools in this country uses an RML 380Z micro) has shown the high quality of imaginative and investigative work that can be achieved when using an Information Retrieval package. Such programs should be within the experience of every child in this country. A few years ago I would not have thought beyond the humble tape-recorder in primary schools – how things change in so short a time!

A true story which I heard from a colleague just the other day illustrates the rate of change and perhaps the pervading influence of the BBC Computer Literacy Scheme (incidentally, do get hold of a copy of the latest BBC publicity leaflet on forthcoming Radio/Schools TV broadcasts in Computer Studies – there are some excellent programs scheduled for next year). Back to my colleague's story – he arrived home to find his three year old son playing 'computers'! He had 'wired' his Jack-in-the-box toy which has two plastic buttons (his keyboard) to the skirting board with a long piece of wood (his connecting cables) and was happily computing! Those 17 year old 'Whiz-kids' had better watch out!

My final point, at least for this edition of MAPE Matters, is that 'IT' has finally arrived – indeed IT arrived today, but as I have to sit and write this article to meet *MICRO-SCOPE*'s deadline I have not been able to open the parcel. IT is my 'BBC Buggy'. I will get it into a school within the next few days, and let you know the teachers' and children's reactions to it in my next MAPE Matters. I feel that it takes a step into the future – into the world of 'Robotics' and Artificial Intelligence.

Children using a word processor

Julian Pixton
Hillary Junior School, Walsall

Walsall Education Authority was one of the first LEAs to invest resources and effort into promoting the use of microcomputers in primary schools. One of the consequences of being a pioneer in this field was the small choice of hardware available, even three years ago.

The selection of the TRS-80 model 1 is not that surprising when you consider that Tandy Corp. has its UK headquarters in Walsall.

Many local authorities are standardising to one particular machine or make of machine, but I feel this could be a bad thing. We have four different microcomputers in our school – a TRS-80 model 1 16K cassette-based system with a Line Printer V11, a TRS-80 model 1 48K double disc drive system, a 48K Sinclair Spectrum with cassette storage and a BBC model B with Microvitec monitor and single disc drive.

Each of the machines has its strengths and weaknesses. We use our 48K Tandy for data handling, information retrieval and (hopefully) soon, record keeping. Our Spectrum has a wonderful version of LOGO (running almost bug-free!). Our BBC runs some excellent simulation programs. This variety, although creating something of a nightmare for LEA backup facilities and in-service training, gives us access to a wide variety of excellent software. This will be denied to those users who are restricted to one type of machine.

Although the graphics limitations of the TRS-80 are well known, this versatile and user-friendly machine has a wealth of software available. In particular, there is an excellent word processing package called *Scripsit*, which gives the TRS-80 most of the capabilities of a dedicated word processing machine. There are both disc and tape based versions – the disc version being the most versatile – but initially I have concentrated on using the tape version with junior children.

After attending a one-day word processing course at our local Education Development Centre one Saturday in mid-1982 – courtesy of the hard working Mike Attewell – I returned to school itching to have a go!

We had been producing a school magazine, *Focus*, for 12 months, as a vehicle and platform for our children's written work. We had used a battered old typewriter to prepare text for the printers, but shortly after my word processing course I set about 'obtaining' a Tandy line printer V11 and the Scripsit package.

I found the documentation accompanying *Scripsit* remarkably easy to understand. After two weekends of frantic, sometimes frenetic, activity I found myself reasonably adept at inserting and deleting characters, words, lines and paragraphs; using the tabulation facility; exchanging words and paragraphs; blocking pieces of text; saving and loading documents on tape; line spacings; window size; justification of text and printing documents.

At the beginning of the new school year in September 1982 we started work on our next issue of *Focus*. I was amazed at how quickly the children (aged 10–11) mastered the commands available and were able confidently to handle the package. I restricted the commands I taught them to the fundamental ones necessary for our purposes in producing the magazine:

G – Control Key.
Z – Word.
X – Line.
C – Paragraph.
S – Insert.
D – Delete.
E – Exchange.
R – Repeat.

BREAK +

S – Save Document To Tape.
V – Verify Document Saved.
L – Load Document From Tape.
P,P – Print One Page At A Time.

As the work progressed, it involved a large number of children, both as contributors and illustrators, and as editors and page planners.

It was fascinating to see the development of the children's ideas about punctuation and literary style. Some members of the editorial team seemed determined to rewrite their own contributions in a savage, almost Fleet Street manner after reading and criticising the work of other contributors.

The fact that suddenly children whose handwriting was deemed 'untidy' or 'poor' were able to produce work of an identical standard of presentation to that of their neatest peers gave a fundamental boost to their confidence and self-image. Instead of a 'Do that again' or 'It's dreadfully untidy', teacher and pupil attention was focused solely upon the content.

The combination of a feeling of mastery and control the children obtained over the written word by using the machine, and the fact that they were using it for a reason, with a specified

end product in view, created an intense and powerful learning environment. Many teaching points were thrown up in the production of each single piece of work. The use of commas, full stops, semi-colons, question marks, apostrophes, speech marks, exclamation marks, hyphens and paragraphing all came alive for the children.

Several things immediately became clear. We had concentrated mainly upon a mechanical approach – i.e. converting work that had already been written using a pencil and paper into typescript suitable for photo-litho printing. The prospect of using the word processor as an alternative medium for the initial draft/editing and rewriting stages implicit in the production of quality factual or imaginative written work seemed very exciting indeed.

The ability to swap the order of words in a line, exchange the order or modify sequences of lines, exchange the order of paragraphs, and then put it all back again easily if it wasn't as required, gives children access to a learning domain which involves manipulating their own thoughts in a powerful and pleasing manner.

After several weeks of intensive work at all available times of the day (playtimes, lunch-times and after school), the magazine pages were laid out, illustrated and ready to pass to the printer.

Our normal run is 250 copies, which are snapped up in school after 2 or 3 days at 10p each. The enthusiasm of the children is such that the next issue is already underway even before this one is back from the printer.

I am being cajoled into borrowing a letter-quality daisy wheel printer for the next issue, or at least something that generates true descenders, as the more vociferous members of the editorial team (shades of 'Dame' Harold Evans and Jocelyn 'Piranha Teeth' Stevens here!) feel our current technology falls somewhat short of their presentation requirements!

In-service courses

MICRO-SCOPE has frequently recorded a concern for the quality of preparation available for primary teachers to meet the challenge of the micro. Here are two very different accounts – a lively report of an introductory course, and planning for work at a specialist level.

1. AN AWARENESS COURSE FOR BEGINNERS

C. W. Bailey

Since the Department of Industry offered every primary school a microcomputer at half price, an enormous head of interest has been generated. If each school were to accept this offer and send two teachers on a local authority in-service course, over 50,000 places would be needed. *Micro Primer* goes a long way towards getting teachers started, but local education authorities are already swamped by the demand for training.

Last summer Vincent Rosewell, the Head of the University Centre for Teachers, asked me if I would put on a 6 week 'short course' – one evening per week – at London University Institute of Education. 'You can get your friends from MAPE as speakers'! I had never organised anything like this before but am not very good at saying 'No'. Anyway I was interested and started planning.

At the time we had so few micros available that it would not have been possible to provide 'hands-on' experience for more than about 10 people, so I decided on an 'awareness course'. The main question the course set out to answer was: what sort of things could you do with a computer if you got one? Running through this was an intention to show teachers software that is compatible with a decent philosophy of primary education. When I phoned people and asked them if they would participate, I said I thought there would be about 50–80 people on the course – maybe it would be just over one hundred.

The course was called 'The Use of the Microcomputer in Primary School'. The blurb said 'no previous experience with computers would be assumed' and no hands-on experience would be offered.

My own experience of attendance at microcomputer events has been of a preponderance of men, and of monitors. Trying to read print on a screen 30 feet away is not easy, and since there have usually been several video-monitors around the room, it must be disconcerting for a speaker to have his/her audience looking in at least four other different directions.

This looked as though it would have to be the pattern for this course too, until I discovered the Eidopher.

I had sat through what I thought were films of videotapes being projected from the back of our largest lecture theatre – the Logan Hall – for a couple of years before I learned that this magic machine was actually projecting from the videotape directly! So, if the Eidopher could project a signal from a videotape recorder, would it project from the video signal put out by a microcomputer? No one knew, so we set it all up to see. Our technician, Warwick Smith, typed in a sine wave program into a BBC computer, and to our delight, it appeared on the screen; the print was legible and it was as large as a cinema screen. It was a black and white picture, but this was a small sacrifice for such a large scale projection.

The largest number we had on a University Centre for Teachers short course so far was 130. This course soon broke that record and went on to nearly 250 before we decided to 'close'. Who were these people? I had no idea, so we decided that we would ask them on arrival to fill in a questionnaire. Nearly everyone did so: they came from 131 different schools and represented 24 different local authorities, and to our surprise 70% of them were women. The majority had teacher's certificates, rather than degrees, and were teaching 7–11 year olds. Fifty-eight computers were in their schools (yet only 21 people said they had used the computer). Of these computers 18 were BBCs, 16 ZX81s with 3 Spectrums, 6 were RML 380Zs and 1 was a 480Z. Vic-20, Tandy, Pet, Video Genie and Apple were the others represented.

So, the group seemed to be fairly representative and were almost all beginners.

We started off with an introductory session, which included videotapes and an outline of the DoI, DES and MEP initiatives.

The second week Bryan Weaver talked about the ILEA primary project, and reported on work using TXED – a wordprocessing package – cloze procedure, *Circlestitch* (a maths program) and *Micro-Leep* – a file-handling program from which some interesting social studies work has been developed using census data.

In the next two weeks we concentrated on simulations. Barry Holmes and Ian Whittington showed a whole range – *Hunt the Thimble,*

Saqqara and *Adventure Island* on their first session.

Up to this point all the equipment had functioned perfectly. We could only use the Logan Hall for the first evening and, since the Eidopher is a permanent fixture in the projection room, it looked as though we would have to use monitors for the rest of the course in the Jeffrey Hall. Then our Media Department came up with another magic machine – the Vior – which also projects videotapes, but is portable. This too took a micro input, and produced a large screen picture, but you needed the lights out to see it, and it had to sit near the screen; we arranged the seating in 2 wedges so that no one was looking at the back of the Vior, but the thing proceeded to be temperamental.

By the time Barry and Ian were demonstrating a simulation of the raising of the Mary Rose we had real problems. The Vior was giving a slightly blurred picture, which half an hour of prior fiddling could not cure, the 'search' part of the program was up and running, the lights were out and Ian was talking. I was shining a bicycle lamp on the second computer which was supposed to be loading the 'Diving' program. We kept getting those infuriating messages that said " ", "Data?", "Rewind tape".

'Don't worry, once you stand him up, Ian will go on for an hour,' said Barry. When a change of cassette recorder gave us the same messages we were flapping. We finally solved the problem, but not without the audience realising that there was something wrong.

The next week we had an evening on LOGO – Beryl Maxwell brought the turtle, and Heather Govier talked about the work which had emerged in Croydon's LOGO project.

How do you show 250 people a turtle drawing shapes on the floor? One idea was to use a live video camera and feed it into the Vior. Catch 22 is: if you illuminate the turtle so that there is enough light to film by, then you will not see the screen because of this lighting! In the end we decided on 'theatre in the round' and set the chairs 3 or 4 rows deep round three sides of the Hall.

Beryl seems to me the ideal sales person for computers in primary schools because (a) she teaches in one, and (b) she comes across as just an ordinary teacher who happens to have discovered LOGO and seen its potential. I think the teachers present really appreciated this.

On the final evening we had Ian Stewart from the College of St Mark and St John, Plymouth to talk about the software that the ITMA project has produced.

Was the course successful? I like to think so: the speakers were really good, they seemed to pitch things at the right level, and the attendance held up over the weeks. Some people thought we could have packed more material in (I had planned twice as much and been advised to cut it down!!), others that we could have done more on the computer itself and how it worked (I deliberately played this aspect down, no one saw a word of BASIC – so as not to frighten them off!)

One person 'did not like *The Mary Rose* at all', 'could not see the point of *Saqqara*', could not see the Turtle (literally!) and thought we should not have had so many people on the course; 'and as for that Vior thing . . .', and 'LOGO was a waste of time after the Horizon programme' (I was presumably expected to know last June that it was coming out during my course!) Who was it said 'You can't please all of the people all of the time . . .'?!?

On the other hand, many more people made appreciative comments. Perhaps we should have finished with a follow-up questionnaire.

I have promised to run another beginners' 'awareness course' in the autumn term. This time we will have the Logan Hall with its good projection facilities, will do more on the hardware, and we will try to do a complementary course; so that anyone who came on this one and wants more will not find there is much overlap. Barry and Ian learned ages ago that a smooth computer show has to be a double act. I am lucky to have Brian Lienard, our lecturer in Educational Computing as my partner.

Every time I do anything along these lines and have 4-way monitors, micros, cassette recorders, videotapes, octopi of leads everywhere, overhead projectors and microphones etc, I keep muttering: 'There is a lot to be said for chalk and talk.' Just to walk in with only some lecture notes . . .

One day the technology will be tamed, but in the meantime – one broken lead and the whole show collapses. We must be mad!

2. AN IN-SERVICE DIPLOMA COURSE

Peter Johnston

At the Gwent College of Higher Education we have recently had validated, by the University of Wales, a part-time in-service diploma course for teachers, 'Microcomputer Applications in Primary Schools'. It is due to begin in September 1983. This is a description of the principles on which the course is based, and a brief outline of the content and assessment.

It was written by myself (involved with secondary and primary science teacher training), Alan Fear (involved with teacher training in the areas of geography and environmental studies) and John Jenkins (a computer specialist).

At the outset the Gwent LEA was approached and supported the proposal. The county's two

advisory teachers for computers and microelectronics will contribute to the course and help with facilities that may not be available in the college.

When deciding the content the following points were used as a basis:

1. The main emphasis is on the use of the microcomputer in the primary classroom, evaluating its influence on the curriculum – traditional and new trends. It is *not* a computer studies course.
2. However, children in our primary schools are growing up with the new technology all around. A growing number may have home computers and many are reading computer magazines instead of comics. Some computer science must therefore be included so that teachers can talk to the children and appreciate the wider implications of computer use and information technology.
3. The course will *not* be training 'teacher programmers' but some programming must be included for several reasons:
   (a) teachers may wish to modify existing programs to suit their own requirements;
   (b) teachers must be able to talk confidently with programmers and so need to know the principles of program design and development;
   (c) programming is yet another point of contact between the teacher and the children's activities at home.
4. Control technology will make more and more of an impact in primary schools, and so the course will prepare teachers for this development in the curriculum.

Structure of the course

The attendance pattern is the normal one for university part-time in-service diplomas, namely three hours a week for two years (six terms).

Time Allocation

The micro in the classroom	60%
Programming	20%
Computer studies	20%

Content and Teaching Scheme

Term 1: Hardware familiarity
Program types
Teaching strategies
Classroom management
User documentation

Term 2: Word processing
BASIC (part 1)
Program design and development
Computer history and architecture

Term 3: Control technology
LOGO
Electronic programmable 'toys'

Term 4: Teletext, Prestel
BASIC (part 2)
Special education
The micro and primary science

Term 5: Specific curriculum areas
Use in testing and diagnostic work
Record keeping
Administration

Term 6: PILOT
Telesoftware
The role of the teacher leader
Social and economic implications of computer use

Terms 4 and 5 will include a number of visits to increase awareness of computer use and various resource agencies – e.g. computerised supermarket, electronic office, industrial computer use; computer centres, MEP Regional centres, SEMERCs. The visits are in these particular terms, with no course work assignments, as this is the time when students will be concentrating on their school based projects.

Assessment

Course work 30%, e.g. documenting and modifying programs, correct use of hardware, word processing.

Three essays 30%: these will centre on the wider computer awareness reflecting private reading.

School based project 40%: this will be an evaluation of an aspect of microcomputer use in the classroom.

The project may involve evaluating a commercial program, some aspect of control technology or a programmable toy, or occasionally writing and evaluating a program. For this reason a full range of topics is covered in the first year so that the variety of project possibilities is appreciated. It is anticipated projects will be mainly developed in terms 4 and 5.

BASIC programming is in two sections, recognising that not all teachers will want to go into it deeply. This allows part 2 in term 4 to be optional and the alternative here will be to concentrate more on program specifications.

Although not mentioned specifically in the broad outline, topics such as sources of software, new developments in the curriculum, pupil motivation, micro/pupil interaction will be covered when appropriate software is being discussed.

Reflecting the advice of our own and neighbouring LEAs, we shall be mainly using BBC(B) machines but students will also have some use of the 480Z and Spectrum.

We are looking forward to assessing the reaction of teachers to the course and, more importantly, the effect it may have on the way the new technology is used in our local schools.

Software reviews

Primary Science: DENSITY and CIRCUIT for BBC Model B (Acornsoft/ESM Education 1982)

The brief history of the use of the micro-computer in primary education shows that some subject areas, like mathematics and language, have a more obvious application of micros than others, like science. That is not to say, however, that just because software is easy to develop in a particular area it is necessarily always appropriate.

The fundamental question when judging the application of a microcomputer must be to ask if the micro is making possible things which would otherwise be impossible, difficult, dangerous, time-consuming, unsatisfactory or less motivating. If the answer is clearly no, then there is no justification for the software, which must be regarded in fact as a disadvantage. Just because the computer is 'hi-tech' and has a current fascination, this does not mean that it has the right to assume the role of an unwanted visitor. In fact to use the micro in this way is a bad advertisement for the use of a micro in general and obscures the new dimension that micros make possible.

Primary science is a subject based inexorably on the direct, first-hand interaction between the child and the environment. The child is firstly the observer and interpreter of his or her environment and secondly the experimental investigator of his or her environment. Any primary science software must be judged in the light of this basic principle.

The program DENSITY is divided into two modules. The first consists of a demonstration in which objects are seen to float or sink in a bath of water. Objects sink at a rate dependent upon their density. After the demonstration more objects are displayed and the child is asked which sinks fastest and which floats. The next part of the program displays a frame of information about the meaning of density, followed by a series of tables in which the volumes and masses of a variety of materials are supplied. The child needs to input which material has the highest density.

The second module is a simulated card game played between child and computer in which the value of a card is the density of the object or material named on that card.

It is perhaps worth mentioning at this point that if your 32K Model B has an Econet interface (as all Beebs supplied under the DoI Scheme have) the operating system will terminate the program about half-way through the game with the message "No room at line 3000". If you do not know how to cope with this problem, you might seek help with the small piece of paper which passes for documentation. But you will find no help there! If you have an Econet interface then the following commands will enable you to run the program. Type BREAK, then

```
PAGE=&1900 ↵
*DISC ↵
CH."INDEX" ↵
```

Using the BREAK-SHIFT KEY autostart facility makes it impossible for the program to run since the BREAK key sets PAGE to &1BOO and, although the program loads, it eventually runs out of space, no doubt due to the creation of temporaries above the program area.

Given that there is no documentation with the disc, one is forced to ask how DENSITY could be used. The frame giving a definition of density occupies the position of an enormous leap in cognition between an elementary exercise in watching things float or sink to making calculations which have as a well-established prerequisite the concept of density. Educationally it is very bad indeed, even though the graphics, colour and sould jingles are pleasant enough. One also wonders why the author chose to mix materials like iron, milk, alcohol and the sun in his list for the tables. There is a terrible mix-up here between breadth of content and the under-lying concept of density. The slow iterations of this part of the program are in addition very tedious since the text is wiped out backwards each time instead of disappearing and being displayed rapidly. It could perhaps be argued that the card game is more useful since the computer 'knows' the values of each card and can run the game more easily than a teacher, but I remain to be convinced of its validity. Why is it useful for a primary child to know the difference between the densities of the sun and a bone?

CIRCUIT also consists of a teaching and a testing part. The teaching part of the program starts with an incredibly slow graphics display of the transference of charge from one side of a cell to the other through a tube corresponding to a wire. The child is then presented with a sequence of circuits involving lamps, short circuits and breaks in the wire. He or she is asked which lamps will light up and needs to get every frame right before moving through to the last part of the program. This consists of a test of increasing difficulty, in which a series of

circuits is presented. Each time the child has to say how many lamps will light in the circuit.

CIRCUIT is marginally a better program than DENSITY. If one were able to ignore the demonstration part then the program might be used as a test about the knowledge of electrical circuitry. But it should only be used in this way after a significant amount of practical work has been done with a real circuit, hopefully without the short circuit features that are encouraged by the program!

The design of both DENSITY and CIRCUIT is based roughly on Skinner-type learning theory. However, traps (like the floating bottle in DENSITY) contravene the theory, and huge leaps (like the concept of density) totally ignore the theory's fundamental principle.

In summary DENSITY and CIRCUIT are examples of programs which have little or no place in primary school science. On the one hand they attempt to replace important practical investigations and on the other they do virtually nothing which could not be done equally well or better without a computer.

Mike Negus
Newman College

The ANGLE suite of programs

The ANGLE suite of programs is produced by Chalksoft Ltd and runs on a 32K BBC micro. The four programs cost £8.95, from 37 Willowslea Road, Worcester.

ANGLEA demonstrates the concept of angle as a turning motion and then relates this to degrees. A good introduction, but I feel that the progression from turns to degrees would be much too fast for most primary school children. *ANGLEC* goes through the procedure of using the 180° and 360° protractors. An angle is drawn and a protractor is superimposed on the angle. The program tries hard to overcome the old problem of which direction to read the angle, but as the protractors drawn do not include two scales nor the extra plastic strip as on most 180° protractors, it is not too successful. No chance is given in this program to estimate any of the angles – a pity, as I feel it would be most useful at this point. The colour choices, particularly for this program, are very poor: in some cases the text could barely be read.

ANGLEB and *ANGLED* reinforce and check what has been learnt in '*A*' and '*C*' respectively. *ANGLEB* has a robust keyboard routine; however some of the possible multiple choice questions are ambiguous. *ANGLED* is the poorest program of the four. An angle is drawn and the child is expected to measure the angle by placing a protractor on the screen. I have my doubts as to the success of this method especially with the curvature of some of the screens available.The angle is given as correct if it is within 5°, whatever the size of angle. If three wrong answers are entered the message 'Ask for help' appears. The input for degrees will accept as answers letters as well as numbers. If the angle is typed in correctly you go on to enter A, B, C or D to name the type of angle. This second input accepts any amount of letters, and also announces them as correct provided that the first letter is the one required. Only upper case letters are accepted for A, B, and C when correct although D accepts upper and lower case – and all the other lower case letters of the alphabet, including the RETURN key! Finally, the 'Try again' response to a wrong answer appears too soon on the screen before the input is ready to accept the next answer – if the user responds quickly, his first digit may be missed.

As 'Computer Aided Instruction' programs *ANGLE* has some good points and I could find a place for it in the classroom providing most of the faults mentioned are corrected. The program shows a certain naivety about what young children key into input routines: it seems a shame that these routines and colour choices have not been sufficiently considered when they can so easily be corrected and improved. I have written to Chalksoft suggesting some possible changes and I will let you know if they take note of my suggestions.

Bert Askins
Newman College

'Pairs' and 'Splitter'
(ESM, Wisbech, Cambs.) for RML 380Z Diskette – ES540

Is 'cared' a valid anagram for 'raced'? The computer, programmed to play *Pairs*, says that it is not. If you disagree with the computer then *Pairs* has just been evaluated and rejected on the grounds that it is educationally unsound. Only those who agree with the computer's decision need to read the next five paragraphs. (Incidentally, the 'right' anagram is 'cedar'.)

Pairs is an anagram game. As it runs the user may choose to see the instructions. These are written entirely in upper case and scroll up until the screen is full. They are continued when the space bar is pressed. Displaying a paragraph at a time (in upper and lower case) would have aided readability. The instructions contain this statement, 'The computer has only been given one pairing word for each of the words it will give you. You may find alternative answers which are perfectly correct, even if it tells you otherwise!'

The program could be used as a game for two children or as the basis for a class activity.

Before either of these options starts the user sets the display time for each word (between 1 to 9 seconds) and also the number of words required for each complete game (between 10 and 59). Program management would be easier if these figures were set outside the main run and remained constant until reset.

If a two person game is selected the players type in their names (in upper case – nothing appears to happen if lower case is used). A word (in enlarged, low resolution lower case) is displayed on the screen for the set number of seconds. The appropriate player types in an anagram. The 'right' word is wrong unless it is typed in capitals. There is no check on the length of the word typed in, alphabetic and numeric characters are accepted until the machine limit is reached. If the anagram matches the one that the computer has been programmed to accept both words are displayed and the player gets a point. Any other word is rejected as 'wrong!'. In that case the other player gets one chance to type in the 'right' anagram and gain an extra point. If both players fail to match the word the computer displays the solution. Each player has a turn until the set number of rounds has been played. The final display reveals the finishing scores.

If the option for class use is selected then words are displayed in sequence (the teacher controls the delay between words) until the set number is reached. Each word is then re-displayed with its paired word. Thus all the children could write their own anagrams and these could be checked against those in the second display.

It is always pertinent to question whether the computer contributes to an activity. As far as I can see the only advantage in using the computer to referee a game of *Pairs* lies in the fact that the computer does the marking and thus frees the teacher to listen to two children complaining about the unfairness of the computer, or, in the class lesson, to listen to thirty-five children complaining about the unfairness of the computer.

Splitter is a game for two players. A word is put up on the screen and each player takes it in turn to give another word (of two or more letters) which is hidden in that main word. The letters of the hidden word must be adjacent, thus, for example, 'car' and 'art' are hidden within 'cart', but 'cat' and 'tar' are not. The sequence of alternate turns continues until all the hidden words have been found. The computer tells you how many there are. A point is awarded for each correct answer. The user governs the length of the whole game by setting a winning score. The game ends when one of the players reaches that point.

The remarks made about the screen display and input routines in *Pairs* apply equally well to *Splitter*. They are, however, beside the point because *Splitter* crashes. If the user types in an unacceptable word the program may crash. When the first player has just completed his turn the program may crash. I don't know what happens at the end of a game because I've never got there.

Splitter is not robust: in my opinion, it should not be offered for sale. If the law protects the customer from porous umbrellas should it not also protect the customer from programs which do not run? If *Splitter* were robust it could then be rejected on the grounds of poor presentation! If we, as teachers, are prepared to accept programs like *Splitter* and *Pairs* we do both education and computing a complete disservice.

Senga Whiteman
Newman College

Book reviews

Structured Programming with BBC BASIC
Roy Atherton (Ellis Horwood/Heinemann, 1983, £6.50 – paper, £12.50 – cased)

This book is different from the ever-growing list of BASIC books for a number of reasons. It may well be received with a mixture of interest and shock, as the author has been for many years a vociferous opponent of BASIC and has rightly preferred to advocate Pascal and, more recently, Comal 80 as more suitable block structured programming languages.

Roy Atherton's change of heart is at the very least a reflection of the improvements in structure made to BASIC for the BBC machine.

The book is clear and full of practical examples, and exploits the excellent graphics facilities and improved control structures in a well-organised introduction to structured programming. It starts at the very beginning and assumes little or no knowledge of maths beyond the primary level, yet many examples are not trivial and demonstrate some real potential uses of the BBC micro. Procedures are introduced through shapes, decisions through user-defined characters, logic and control through colour, and all the ideas are used to conceive, specify, build and develop a program. Line numbers are missed from listings, giving a non-BASIC look to the book. The cover bears the words: repetition, modularity, decisions and logic.

A very useful and important book in the best tradition of British compromise.

Roy Atherton closes the Preface with these words about the BBC micro and BBC BASIC: 'Professional integrity requires that certain details be criticised, but, if the good features are used, this system could represent considerable progress.'

Henry Liebling
Newman College

Microcomputers in the Classroom
Alan Maddison (Hodder & Stoughton, 1982, £3.75)

This book aims to introduce the use of microcomputers in schools. It should give the reader enough information and confidence to enable him/her to start gaining practical experience.

The book is divided into three parts. The first lays a general foundation. It introduces the microcomputer, explains what it is and gives a brief description and analysis of its related parts. It goes on to deal with software, mentioning some computer languages on the way, and describes the types of programs that are available and useful for schools. Attention is drawn to program presentation, style and design.

Part Two covers the role of the microcomputer in the classroom. Computers are placed within the context of the curriculum. Possible applications are discussed. These include computer aided learning, computer aided instruction and the computer as an electronic blackboard. There is advice about choosing and caring for your computer.

Part Three explores the place of the microcomputer in school administration and suggests specific areas in which it could provide an efficient service. It goes on to discuss more general applications including word processing, mailing lists and library cataloguing.

There are three appendices to this book. The first offers a list of points to consider when choosing or assessing programs. The second refers the reader to further sources of both information and programs. These two are particularly useful. The third describes some computers currently (late 1981) in use.

This book is easy to read. The design and layout are clear. Each chapter is followed by a summary. The author has assumed no previous knowledge on the part of the reader. Technical terms and their abbreviations are explained as they are introduced. The contents cover a wide area of information and the stated aim, that of providing an introduction, is achieved. Books relating to computers are usually rather expensive: at £3.95 this book is a bargain. I'd recommend it to any teacher wondering where or whether to begin.

Senga Whiteman
Newman College

Beginning micro-PROLOG
Richard Ennals (Ellis Horwood/Heinemann, 1983, £6.50 – paper, £12.50 – cased)

This well laid out and timely text is aimed at the non-specialist trying to explore the jungle of diverse computer languages that might be relevant to education.

The book describes teaching material developed to assist the interaction of a new computer language, children and teachers in a classroom situation. The obvious enthusiasm of the children, extending both themselves and their teachers, pervades the book.

In the foreword, Bob Kowalski, founder of logic programming, indicates the validity of PROLOG as a programming language, specification language, and language for database definition and query, but stresses that the real value of logic programming for education lies in its contribution to the teaching of logical thinking in all areas of the school curriculum.

Richard Ennals seeks to justify this last point before embarking on the central section of the book. This takes the reader at a steady pace (using examples derived from work at Park House Middle School, Wimbledon) through the easy beginnings of simple sentences in PROLOG on to queries, the excitement and difficulty of making rules, lists, the dreaded but vital recursion, and ends with operations on lists.

This work was developed for use with thirty 10–11 year olds for two 70 minute afternoon sessions a week, using one micro and a large monitor, during what would have been maths and activities sessions over a one year period.

The last section of the book deals with the 'Logic as a Computer Language for children' project, describes numerous examples of logic across the curriculum, and concludes with PROLOG for greater things.

With a title like *Beginning micro-PROLOG*, the first appendix on simple PROLOG instructions for use could have been more explicit and longer. It would be helpful to know the meaning of "&", ".", "?" and "1.", and the significance of the difference between upper and lower case commands such as "LIST ALL", and "List All". Admittedly these points are explained in *A micro-PROLOG Primer*, free with the language.

Answers to all the examples are given in the second appendix and Appendix 3 gives details of the availability of micro-PROLOG in the dim and distant days of last September.

A detailed description of the language can be found in the micro-PROLOG Programmers' Reference Manual, also free with the language.

Micro-PROLOG is currently available from Logic Programming Associates for all Z80 based machines with a CP/M operating system, it is

ready and working (I've actually seen and used it) on the Spectrum, and due to be released for the BBC machine soonish!

Bearing in mind that micro-PROLOG 3.0, with editing facilities and a more friendly front end (easier to use), is fast being extended with facilities such as Derek Ball's graphics, including lightning fast turtles, and the proposed 'query-the-user' facility, I strongly recommend anyone who is serious about using computers in schools to look beyond any novelty or band-wagon effect at the power, potential and extensibility of micro-PROLOG.

This book is the only non-specialist book on PROLOG (it had to be for me to read it), there are only five books on PROLOG anyway, and as such it is a must for computer libraries and computer centres amidst the plethora of books on BASIC (enough said).

Henry Liebling
Newman College

ALSO RECEIVED

Nineteen Eighty-Four
George Orwell (Secker & Warburg, 1949)

Optimistic.

Education in the Microelectronics Era
John Maddison (OUP, 1983, £4.95 – paper)

A wide-ranging, civilized and humane account, full of useful references and discussion of principles and trends. Not technical, not primary-centred.

Teaching Humanities in the Microelectronic Age
Anthony Adams and Esmor Jones (OUP, 1983, £4.95 – paper)

'Statistics, statistics! That's all you fellows want nowadays, isn't it, dearie?'

Letters

1. Commercial note

During the recent MAPE conference at Loughborough it became evident to me that teachers are becoming more critical of software available for use in their schools. Not only are they looking for program content: they are also looking at such things as back-up materials, 'crash-proofing' and visual impact. I found this very encouraging. At the Exeter conference in 1982 the greatest concern was, without doubt, the merits (or otherwise!) of the various micro-processors available and teachers were worried about 'which one was the best'.

This year I had the opportunity of discussing with many teachers their attitude towards the software we produce. It is not for me to comment on these pages on their reactions other than to say I left Loughborough feeling quite pleased! However, the reason for my writing is that I am concerned that, when asked 'What kind of software do you want?', very few teachers were able to offer any concrete suggestions. Many thought that simulations were the answer but were not sure whether they wanted topical simulations or games simulations or simulations that dealt with only one subject. Others thought that good 'skills and drills' software was the answer to all their problems.

As a commercial software housing dealing almost entirely in the primary software market, we spend many hours sifting through ideas before we even attempt to start putting a program together, not to mention the resource material produced by our publishers, Ginn. We are, of course, grateful for 'user feedback' and I would like to thank those of you who have bought our programs and have taken the trouble to write to us about any aspect of them. Criticism (constructive or otherwise) is always treated by us most seriously. Only the teacher confronted with a class of children is in the ideal position to know whether or not software is achieving his or her aims.

If any of you would care to write to us putting some of your thoughts down on paper as to the type of software you feel would be most useful to you, we will be only too pleased to listen. I should perhaps add that this is not a request for all the brilliant ideas that you may have as regards program content, but simply the opportunity of putting some of your concerns and interests forward as a possible basis of new software!

Brian Richardson
Cambridge Software House Limited
The Town Hall, St Ives
Huntingdon, Cambs, PE17 4AL

2. Home and School

In this rapidly progressing world, the gulf between home and school is in danger of becoming wider and wider. Children return home from school and, when asked what they have been doing, do not expect their parents to understand, especially if they have been using computers. The gap between home and school, parents and children becomes wider, leading to ever more social problems and the breakdown of families.

As a trained teacher, but not employed, I decided when my son was born two years ago that I would not allow this to happen in my family. Among other things I began to investigate computers. I realised that I had to start early to learn about them, to teach myself, in order to help my son.

I started with the BBC Referral Service and magazines. Through the BBC, I heard of MAPE and joined. A great deal of investigation led to the purchase of a Texas Instruments TI 994A micro; I wanted a BBC 'B', but finance would not allow this. It is a long slow process to learn the techniques, and the more I see, the more I wish I could have afforded the BBC – not because we like it better (we have had one on loan from my husband's firm), but simply because everything seems geared to the BBC machine.

I was glad to see that there is to be a *MICRO-SCOPE Special* for parents. I think that there could be more coverage of other machines, as this would help many parents who cannot afford the more expensive micros, yet are determined to help their children into the computerised future.

Perhaps besides local co-ordinators there could be specific machine groups, or a parents' group; or age range groups (up to 5, infant, junior and secondary). I would be willing to help with any of these. My knowledge of computers is not extensive, but by getting together perhaps we can all help each other.

Perhaps parents who have tried to keep up by purchasing a micro (but not a BBC) might be made to feel that they are not just 'playing' at computing, because of the very great emphasis placed on articles and programs for the BBC micro.

Mrs Ann Simcock

3. INOUTOFFPUT

I am in the process of preparing some material relating to the uses and abuses of micro-computers generally and to the crazy things they say in microcomputer manuals specifically. If any of your readers has a relevant funny story or can point to specific instances of gobbledygook in manuals I'd be delighted to hear from them.

Dr Michael Thorne
Maths Institute
University College, Cardiff

Notices

Regional News – MAPE Scotland

Scottish MAPE members are invited to a one-day 'seminar' plus discussion session. This notification is an early warning to keep the day free in your diary! The intention is to combine formal presentation with informal discussion sessions, according to the interests of those attending.

Cost: £5 (including coffee and lunch)
Time: 10.00 a.m. Saturday, 22 October 1983.
Place: Dundee College of Education.

For details/attendance forms contact:

Russel Wills,
Computer Education Department,
Dundee College of Education,
Gardyne Road,
Dundee, DD5 1NY.

or telephone Margaret Johnstone at 0382 – 453433 ext. 484.

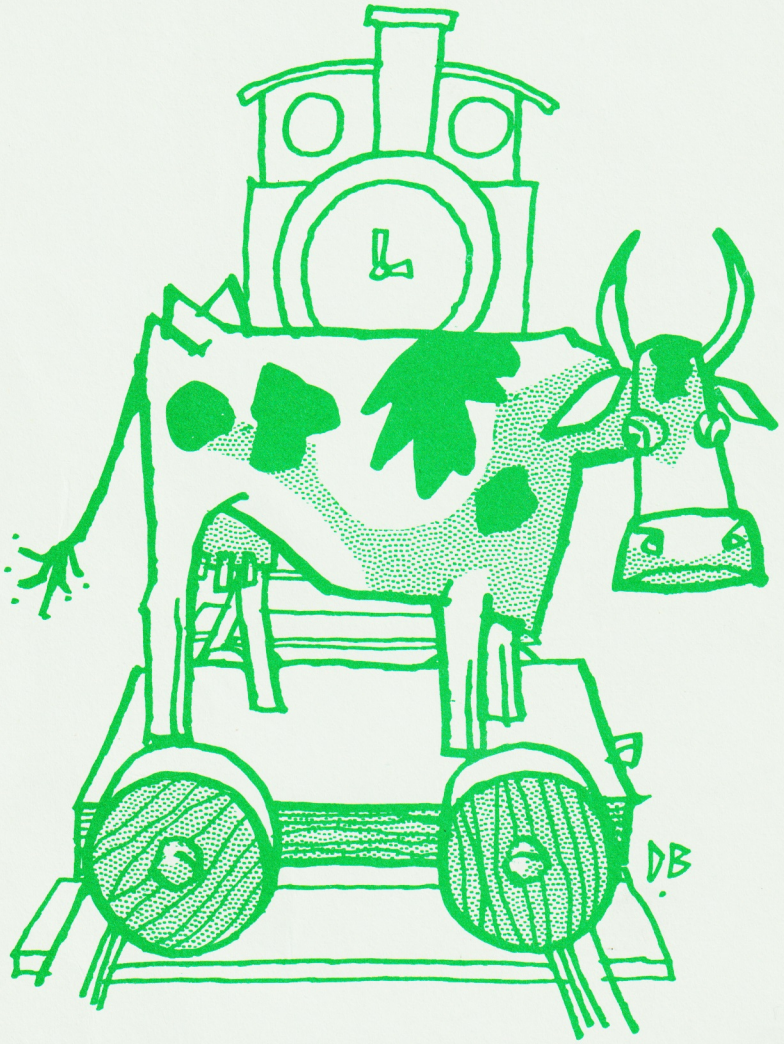
Diploma in Computer Applications to Education, 5–13 age range

Applications are now being accepted for the full-time Diploma, commencing September 1984, at Newman College, Birmingham. It is a one-year course validated by the University of Birmingham and carries DES approval.

The course aims to equip teachers to understand, initiate and guide developments relating to the use of microcomputers as a teaching aid across the primary curriculum. It will enable teachers to assess critically possible applications and to participate in software design and evaluation. It is also intended to prepare teachers to lead colleagues within their own schools and local education authorities.

The College has a specially equipped Computer Centre with approximately 30 micros (RML and Acorn).

It will be possible to provide accommodation on the campus. Further details and application form can be obtained by writing to The Registrar, Newman College, Bartley Green, Birmingham B32 3NT.



Jointly published by

Ginn and Company Ltd
Prebendal House
Parson's Fee
Aylesbury
Bucks, HP20 2QZ

ISBN 0 602 22676 7

Heinemann Computers in Education
22 Bedford Square
London WC1B 3HH

£1.50

ISSN 0264-3847