

Kenneth Lovell (1915 - 1996) :
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Title

First, for those who do not understand my title, here is what the two excellent dictionaries at my disposal record:

'methodist' -

one who observes method;

a person who advocates a particular method or system of procedure;

'pioneer' -

one who is among the first in new fields of enterprise, exploration, research; an initiator of a new enterprise; ground-breaker; innovator; inventor; leader; trend-setter;

....

'mathematics (mathematical ?) education' -

There is no entry under this heading in either dictionary. I shall therefore have to leave it to readers to depend on the meaning they have no doubt already constructed, with or without negotiation with others.

Origins

Secondly, I should state that I have never given a talk like this before - about the life and work of an individual, a former colleague in fact, and his contribution to mathematics education. The suggestion was put to me some months ago that BSRLM ought to acknowledge the contribution made by Ken Lovell to mathematics education research, and that the forthcoming meeting at Leeds was the right place to do that. As someone who knew him reasonably well, and worked with him over a period of time, I was asked, and agreed to speak about this once very prominent figure in the world of mathematics education. It did not occur to me until the day of presenting this paper that I was doing so at the end of a week of remembrance across the country, and this seemed to me to make it even more appropriate. In considering how to do the job, I thought that the best way was to tell the story in a personal way, through my own experiences, and I hope readers will forgive me for choosing that method.

To complete these opening remarks, I am aware that there will be many in BSRLM who have never heard of Ken Lovell. It is, after all, something like twenty years since he published in our field. I should therefore point out that Ken Lovell was very familiar with the work of BSRLM, and indeed that he presented a plenary address at the BSRLM (then BSPLM) weekend conference held here at Leeds in 1981.

First contact - *Educational Psychology and Children*

After graduating in mathematics from the University of Manchester, I travelled to London to study for my PGCE at the Institute of Education, University of London. During that year, I found the compulsory course on educational psychology much to my liking. Indeed, I don't think I have ever got over my surprise that most of my peers did NOT appear to find it to their liking. For me, it was a first introduction to a new and fascinating world, one in which people thought about learning and teaching, researched the problems and issues, reflected on the outcomes, and which was brought to life by what went on in the very classrooms in which my naivety and inexperience were being exposed daily.

Our lecturer, as I remember, was Professor Vernon, himself an acknowledged leader in the field at that time. The recommended text, *Educational Psychology and Children*, with a Foreword by Professor Vernon, was by Kenneth Lovell. I didn't know anything about Ken Lovell at the time. I didn't know that he had relatively recently been one of Vernon's PhD students. Looking back, it was quite a compliment that an eminent leader in the field was recommending as the set text for his course a book which had recently been written by one of his former research students. I think that is a measure of the impact Ken Lovell was making at the time, and was to continue to make across a number of fields. I also did not know that the PhD grounding which Ken Lovell had received included a heavy dose of psychometrics, the use of statistics such as factor analysis which at the time had basically to be carried out by pencil and paper, which says much for his mathematical expertise.

From my point of view, I liked the set book. It was clear, informative and easy to read. I believe it is now out of print, for the books we write all have their season, and no book, with a very few notable exceptions, lasts for ever. It had a very successful and quite long run, and probably influenced the early development of very large numbers of teachers in training. It certainly opened my eyes to issues of learning. And that ends my first contact with Ken Lovell. Not only was it a very indirect form of contact, at the moment you might be wondering where is the mathematics education link? Be patient. After PGCE, my immediate and pressing focus was on surviving and learning to teach in classrooms in a purpose-built comprehensive secondary school of some 1800 pupils.

Second contact - *The Growth of Basic Mathematical and Scientific Concepts in Children*

Within a couple of years of school teaching, and under the tutelage of an excellent Head of Department, who himself went on into teacher education, the interest in issues of learning and learning difficulties initially aroused in my PGCE year re-emerged - and even more strongly than before now that I knew a great deal more about the kinds of problems which were being revealed in the classrooms. We looked around together for books that might help, for our small but growing library of books for staff use. We found the recently published *The Growth of Basic Mathematical and Scientific Concepts in Children*, by Kenneth Lovell. This quite

excited me at the time, because I'd had happy experiences with another book by the same author. In fact, it almost seemed that he was becoming a friend.

To me *'The Growth ...'* seemed an amazing book, of just the kind that I thought teachers ought to be able to benefit from, and such as I had until then concluded just didn't exist. In fact, it may not have been unique, but there certainly were not many books around which provided those kinds of insights for ordinary classroom teachers. Nowadays, there are many such books, but then there were very few. Perhaps its relevance was more obviously for primary school teachers, but one thing I had quickly learned as a teacher was that there is no clear divide between primary and secondary. So what the book did for me was to open up even further this new world, one in which serious studies of children's learning in mathematics were exposed. Looking back, it seems to me that this was a pioneering work, and that many other authors since have followed in the footsteps. First published in 1961, the book discussed the learning of number, substance (mass), weight, time, space, length and measurement, and area and volume. The enormous amount of detail included within its chapters was wrapped around by more general discussions of concept formation and children's learning in mathematics in the opening and closing sections.

Third contact - MEd studies

By the time I had completed 5 years of teaching, and as a newly appointed Head of Department, I had decided I wanted to study for the degree of MEd. At that time, I bought my own copy of *'The Growth ...'* a later edition than the one we had bought for the school some years before. It was around this period that I realised that not only had Ken Lovell written this book, as a single author, but he had been actively involved in some of the research studies which supported the text of the book. I found references to ten major research papers published between 1955 and 1962, covering space, time, substance, weight, volume, speed, geometry, logical thinking, logical structures and intellectual deterioration. To produce ten such papers within eight years, plus a major innovatory book, now seems to me to have been a very considerable contribution to mathematics education within a very short period. After all, it must be remembered that Ken was fundamentally an educational psychologist, and was therefore involved in a wide range of other research projects at the same time. During these years and the rest of the 1960s, he published papers on intellectual disability (known as 'backwardness' at the time), reading impairment, and gifted children, to name just a few which I know about, as well as other papers in learning mathematics and science, such as in ratio and proportion.

Of course, he had co-authors in some of the ten research papers referred to above. The knowledge I have now suggests to me that they were probably all his research students, possibly all serving teachers completing part-time degrees, though I had no idea at the time. Only after he wrote and published a paper based on my own MEd dissertation did this particular academic game become clear to me. But this doesn't detract from the contribution which he was making at the time, in fact it

2

also highlights just how many teachers completing higher degree dissertations he was supporting through what is known as 'supervision'.

In due course I enrolled on the MEd course at the nearest university which offered one, which was Leeds, and of course I soon discovered that I was going to meet this man, as one of my lecturers. I was not disappointed, in that Ken was a good lecturer, and that was what mattered in days when lecturers were only judged by their students on their lecturing prowess. He was quite the best lecturer on the educational psychology course, and the most informative on the whole MEd. It was clear he knew an enormous amount, and was able to introduce us to a selection of his knowledge intelligibly, but of course in a very formal way. One listened, and wrote, and at the end one had copious notes to take away, reflect on, and follow up from the books recommended. He was supremely articulate, eminently clear, but in no way did you expect or try to ask questions, or engage in discussion, except on his terms, occasionally perhaps towards the end of a lecture. It was many years later that I finally had to admit he was not comfortable in open discussion situations, and found the kinds of questions which one often gets at the end of education lectures difficult to handle (some seem to demand speculation, others suggest misunderstanding, and so on). I have never fully understood this, but there is no doubt that he liked to be in control. And if you allowed him to remain in control you learned a great deal. One of my more extrovert former colleagues once likened his style of delivery to a sermon. But at least one was listening to someone who had something to say.

Fourth contact - PhD studies

After completing my MEd, I clearly remember vowing that never again would I undertake part-time studies, that is, studies alongside a full-time teaching job and growing family commitments. Within two years I was back at Leeds, however. A combination of new career aspirations and the interest that had always been there from my PGCE days took me back to Ken Lovell to study under him for a PhD part-time again! In these new circumstances I saw a rather different Ken Lovell. One who was perhaps more approachable, more willing to discuss, more willing to open up on a whole range of matters and interests, both educational and otherwise. For example, I remember him talking about the impact he thought the Chinese were going to make in the next century (we haven't long to wait now to find out how right he was), and I have no idea how we got onto that topic. I also remember him telling me one summer that he was going away to Scotland for four weeks, to a remote island, to get away from the pressures in Leeds. I responded as one does, and wished him a good holiday, upon which he told me he was actually going away to write a book. And, of course, I might have known. It was typical that he should be intending to write an entire book during what is to the students 'the summer vacation'. I didn't know much about university work at the time, and how the vacation for students is often academically the most productive and creative time for the staff! Nor did I understand that, for Ken, there was a strong Scottish connection. We believe he originated in the Exeter area, but his wife came from the Isle of Harris. No doubt she would be meeting family and renewing acquaintances

while he worked. Which reminds me of another discussion we once had about the nature/nurture debate, when he used as evidence for his point the many outstanding Scots who had emerged over the years from very impoverished environments (both intellectual and physical). He was also influenced by his Scottish connections, I think, when he embarked on his occasional remarks about parochialism of all kinds, for he was very much an internationalist in outlook.

However, despite the slight adjustments in our relationship, Ken was always basically autocratic - colonial in the words of another colleague. You followed his methodology or you didn't study with him. To use, and perhaps abuse, the words of Psalm 33 verse 9, "For he commanded, and it was done".

Research methodology

It is now appropriate to say something of Ken's methodism, referred to in my title. The methodology as it applied to me was, having defined the area of mathematics through which to investigate students' understanding and cognitive development, elementary calculus in my case, to devise and pilot test questions, conduct clinical interviews with as many 'subjects' as HE decided was appropriate (110 x 2 sessions of up to about one hour each, in my case - it was to be 120 but he detected that I was running out of steam!), and it HAD to be clinical interviews, to rearrange the data into sensible items, use a whole range of statistical techniques from mean and s.d. to ANOV A, factor analysis, and others, and in conclusion to look for identifiable levels of performance and/or understanding. My MEd dissertation (30000 words in the 1960s, I should point out, even for a 'taught' MEd) was the same structure, but based on relations and functions rather than calculus. So if you want to know more about this methodology, look at either my own MEd or PhD dissertations! I might add that he was a hard taskmaster when it came to quantity of effort, and the transcription of such a huge quantity of conversation is something I shall never forget. And nor will my wife.

I should make three comments about this methodology. First, although I might have given the initial impression that this was a routine procedure, that would be a false conclusion to draw, for considerable thought needed to be applied at a number of stages. As examples here, I should draw attention to steps such as devising suitable interview questions, adapting in the light of piloting, adapting and responding within interview situations, making decisions about regrouping test elements into 'items', making decisions about the statistical analyses and their interpretations, and finally and most importantly defining and justifying the levels, and of course discussing the implications. Secondly, university supervisors have their own reputations to preserve, let alone the fact that they cannot afford to be seen to be letting their students down, and it should not be surprising when a 'safe', tried and tested research method is the one advocated to research students. Third, the methodology was not inappropriate, particularly perhaps for the 1960s and 1970s, and much investigation of children's and students' understanding of mathematics, and of course their intellectual development, was being carried out at the time. Styles of research have their day, too .

Incidentally, in terms of religious adherence, we believe that he was a Methodist. Perhaps we shouldn't be surprised.

The American connection

Whilst working with him, in the 1960s and 1970s, I became aware of what I can only describe as the American Connection. He kept disappearing to the USA. Often, he was invited to speak at a conference, usually to present a keynote address (in fact I don't think he would have gone there for anything less), or to act as a consultant. There is no doubt that he was highly rated in the USA, probably even more so than in Britain, and he was regarded as a consultant of great repute. Altogether, he went to the USA on more than forty occasions in this period, that is, something like two or three times each year. His areas of particular expertise, for which he was invited to speak, were first the work of Piaget, with whom he regularly corresponded over many years, and second mathematics education research. Ken was undoubtedly an acknowledged expert on the work of Piaget (who refereed his successful application for a personal chair in educational psychology and not many people can claim that), arguably the foremost expert at the time at least in Britain, and his American connections suggest a case for even further afield. That makes it easier to understand why there was always a strong developmental/Piagetian element in the work of his research students at that time.

As my first example of this North American connection, I mention the book edited by Myron Roszkopf, Leslie Steffe, and Stanley Taback, entitled *Piagetian Cognitive-Development Research and Mathematical Education*, published in 1971. This basically consists of the proceedings of a conference, held at Columbia University in 1970, intended to bring mathematics educators and educational psychologists together. The proceedings contained fourteen papers, five of which were by Ken Lovell. In other words, he had been invited to present a plenary on each of the five days of the conference. The titles of his papers were as follows:

- Some aspects of the growth of the concept of a function,
- The development of the concept of mathematical proof in abler pupils,
- Proportionality and probability,
- The development of some mathematical ideas in elementary school pupils,
- Some studies involving spatial ideas.

The first of these was based on my own MEd dissertation, and I clearly recall being hurried along towards the end, so that it could form the basis of one of these conference papers!

My second example relates to the subsequent book edited by Myron Roszkopf, and entitled *Children's Mathematical Concepts: Six Piagetian Studies in Mathematics Education*, published by Teachers College Press in 1975. In the Introduction by Roszkopf we find the following: "At the point in a methods course when I was about to start my lecture on learning theory and mathematics teaching, during the

spring of 1965, I suddenly realised that what I knew was sadly out of date. When Henry van Engen invited me to work with him at the University of Wisconsin Research and Development Center for Cognitive Learning, I jumped at the chance. For, away from committee work and student advisement, there would be time to read in psychology. Van Engen was about to embark on a new interest: Piagetian studies. That influence was deepened by three weeks of conversation with Kenneth Lovell (University of Leeds), who had been invited by van Engen to take part in a series of colloquium meetings on cognitive learning. To those two men and to van Engen's students I owe my lasting interest in Piaget's theory of intelligence."

My third example is that at the Celebration Conference in the USA, to mark the 80th birthday of Jean Piaget, Kenneth Lovell was invited to give the Keynote Presentation.

My fourth example is the book which Ken wrote entitled *The Growth of Understanding in Mathematics: Kindergarten through Grade Three*, published in 1971. Although this book was available in Britain, the title clearly indicates that it was principally aimed at the American market.

I don't think I ever knew the half of his American connections. It was clear at the time that he was very much in demand, and that he was exerting an influence of some kind, possibly quite a considerable one. I recall him coming back on one occasion and commenting on developments in the USA. He clearly foresaw what he referred to as the impact that he thought North American mathematics educators were going to make on the world scene from then onwards. I might add that another aspect of Ken fell into place once I knew of this very strong American connection. He always spoke with what might now be described as a curious midAtlantic accent.

Further reflections on his work

Ken had made a comparatively late start to his career, having served in the RAF until he was 31 years old. It is not clear to me where he gained his early experiences as a teacher of mathematics, though he did publish (with C. H. J. Smith, in the 1950s) a number of books on teaching primary mathematics, incorporating some pupils' books entitled, '*Two Grade Arithmetic*'. We would probably describe these nowadays as dull and unenterprising, but they obviously served their purpose at the time, and this series survived in print for much longer than his more innovatory academic works. (He also made another foray into producing mathematics textbooks later in his career.) Immediately before coming to the University of Leeds he was 'Master of Mathematical Method' at Borough Road College, in London. His expertise therefore clearly successively embraced mathematical method, educational psychology and educational research methods, the work of Piaget (a lifetime's study in itself), research in mathematics and science education, and in the later years computer based learning and research in that field. In fact, after retirement and up to his death, he was still voluntarily reading research journals on behalf of the Computer Based Learning Unit here, and coming to Leeds three times a year to report back. Naturally, I have only been able to mention a

selection of his publications. He made many contributions to British publications as well as to American, for example to *Cognitive Development in the School Years* (edited by Ann Floyd, and published as an Open University set book in 1979), and to *Mathematical Education* (edited by Geoff Wain, and published in 1978, one of the earlier books to attempt to define our field). And if I may emphasise again, I have focused in this paper mainly on his publications in mathematics education. There were very many others in educational psychology and across an impressive variety of its applications to education and classroom teaching. His central interest was always educational psychology; what he did for mathematics education or any other specialism always stemmed from that.

As a colleague and supervisor, Ken was without doubt wise, utterly incorruptible, totally dedicated to both teaching and research, and extremely knowledgeable in his specialist fields. Students under his care were never shortchanged, and I well remember the many supervision meetings I had with him on Saturdays, because as a school teacher those were the only days I could get to Leeds. I learned a great deal from him. For example, I remember him telling me how he always re-worked the statistics in higher degree theses which he was examining, even if it meant re-running the data through a computer. This is an example which I have tried to follow, only to be frequently thwarted by concealment, usually of basic data or of essential decision-making, within the computer-supported analysis, something which I can only deplore. I was appointed to a post here at Leeds in 1974 and, after some delays on the way, completed my PhD in 1980. Ken Lovell retired in 1981, so I never had the opportunity to develop a working relationship with him just as a colleague, and not as a research student. In some ways I think that is a pity. In other ways, however, I wonder if it would have been possible to jointly develop new research approaches, or whether the Piagetian influence would have remained dominant. It would be quite wrong to make any assumptions here, and he might well have been able to embrace other research paradigms as easily as he appeared to have continued to adapt throughout his working life.

In my work in a university, I have sometimes encountered criticisms of Ken and his work, usually from colleagues in other universities, because of his enthusiasm for a Piagetian paradigm. It must be remembered that there was a time when this was not inappropriate. All kinds of research, just as all areas of human endeavour, might justifiably have their day. Ken would never have been unfairly critical of the honest endeavours of others, rather he would have been moved to offer help and advice, because, "That is what the Queen pays me for". But he did frequently express amazement at some of the expensive research projects that the government and other bodies were funding, because he claimed it was obvious what the conclusions would be. In broad terms, he was always right, though of course not necessarily in the detail. He should perhaps have been used much more than he was as a consultant in Britain, though perhaps he wasn't vocal and extrovert enough. Certainly, he would never have pushed himself forward, believing that one's reputation is best judged through one's published work. It also always seemed to me that he was not particularly interested in the current game of seeking as much

external funding as possible, though he frequently took on the role of consultant in the funded projects directed by colleagues. Research by and through his students, and the resulting publications, seemed to me to be his real forte.

For me, his lasting memorial in terms of mathematics education is that he was so dominant, particularly from the mid-1950s to the mid-1970s, when the area of study known as mathematics education was first emerging, and research into children's learning in mathematics was relatively new. His contribution throughout that time was an impressive one, particularly since it was not the sum total of his work as an educational psychologist. He therefore surely deserves to be remembered as one of the pioneers of mathematics education research. Here, at Leeds, his reputation was one of the justifications for the institution of a Centre for Studies in Science and Mathematics Education, which in turn led to the appointment of a number of staff (including myself) whose research responsibilities were clearly to continue and develop the work he had begun. He set a demanding example.

Bibliography

For convenience, I list here the full details of Ken Lovell's publications in the field of mathematics education referred to directly or indirectly within the text. I do not claim that this list is in any sense exhaustive.

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