THE INVOLVEMENT OF TEACHERS
IN CURRICULUM CHANGE

E.A. PALMER
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Preface

EDWIN ARTHUR PALMER.

Curriculum building is a complex process; a process which has, in recent years, intensified. The rapidity of technological development has placed on educationalists a greater pressure than ever before. Furthermore, the concept of co-operative curriculum building, with the involvement of teachers in curriculum change, has become more crucial.

THE INVOLVEMENT OF TEACHERS IN CURRICULUM CHANGE.

With special reference to the introduction of programmes in mathematics into primary classes.

This thesis sets out to examine the process of syllabus revision in New Zealand in one particular subject area, mathematics. It aims to evaluate the degree of consultation between the New Zealand Educational Institute, the teachers' professional organization, and the Department of Education which is ultimately responsible for syllabus revision. It wishes to discover the role played by the practicing teacher in this revision.

Submitted for the degree of

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Curriculum building is a complex process; a process which has in recent years intensified. The rapidity of technological development has placed on educationalists a greater pressure than ever before. Furthermore, the concept of co-operative curriculum building, with the involvement of a wider number of people has come to receive greater acceptance.

This thesis sets out to examine the process of syllabus revision in New Zealand in one particular subject area, mathematics. It aims to evaluate the degree of consultation between the New Zealand Educational Institute, the teachers' professional organization, and the Department of Education which is ultimately responsible for syllabus revision. In particular the thesis wishes to discover the role played by the practising teacher in this revision.

The revision of the mathematics syllabus has been chosen for three reasons. First, the writer has been personally involved, second, the change represents a major revision and third, it is the best documented of any syllabus revision in the last decade.

The writer is indebted to E.J. Simmonds, national
secretary of the New Zealand Educational Institute, for unreservedly making all the files of the Institute available for the preparation of this thesis. Grateful thanks are also due to P.D.K. Ramsay, the Institute's curriculum officer for reading the draft and making a number of valuable suggestions.

The Department of Education however, refused the writer access to any of its files on the grounds that some of the information was confidential and that as the introduction of the new syllabus and textbooks was still an on-going process, information about these could not be released. The writer wishes to acknowledge the assistance given by the district senior inspectors in Wellington and Taranaki who provided data on in-service courses held in their areas, H.A. Reeves and J. Cox of the Curriculum Development Unit with whom discussions proved to be quite fruitful.

E.A. Palmer.
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1. The New Zealand Educational Institute (Institute) is a professional organization of some 17,600 teachers. Membership is voluntary and open to all certificated teachers in State schools.
Chapter 1.

At the turn of the century, George Hogben rewrote the syllabuses almost single handed. Since Hogben's time, a considerable amount of syllabus revision has taken place with an increasing participation of New Zealand teachers. The tremendous growth of knowledge, the results of educational and psychological research have, over the years, altered views concerning the content of education and how this content should be balanced.

The final responsibility for the content and balance of the curriculum rests with the Department of Education. The Department has often shared this responsibility with the teachers and teachers' organisations.

The extent of the involvement depended largely upon the personal attitude of the Director-General of Education. Hogben, for example, believed in and practised consultation; some of his successors, notably Anderson and Strong did not. C.E.Beeby revived and increased consultation in the 1940's when the 'rolling' revision of the curriculum began.

Since 1883, teachers, through the New Zealand Educational Institute 1 have had a deep interest and considerable effect

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1. The New Zealand Educational Institute (Institute) is a professional organisation of some 17,000 teachers. Membership is voluntary and open to all certificated teachers in State schools.
upon curriculum development in New Zealand.

The present Department policy is one of full consultation. B. M. Pinder, Director of Primary Education, speaking at the first Conference of the New Zealand College of Education in 1968, made this point quite forcibly when he stated:

"When one refers to "the Department" it is easy to think of some highly centralised monolithic structure dictating to all and sundry. In fact, however, correlative with the word "Department" are such words as "consultation", "discussion", "negotiation", "agreement". The Department rarely acts in major matters without the closest consultation with the local authorities or with the teachers' professional bodies."

In 1951, an officer was seconded to the Department with the temporary rank of inspector to act as Curriculum Officer. The function of the Curriculum Officer was to keep the curriculum constantly under review. It is probable that the setting up of a Syllabus Revision Committee by the Director of Education in 1950, to unify and correlate the reports of already existing curriculum committees for the various subjects in the Primary School Curriculum made the appointment of such an officer essential. The Institute was invited to nominate three members to join this committee. The letter extending the invitation represents the start of the Syllabus and Curriculum files at the Institute's Head Office.

During the next two years the Institute was involved in some discussions with departmental officers on the draft of the arithmetic textbooks which were under revision.

3.

Consultation in the early period must have lacked consistency as a remit to the 1953 annual meeting of the Institute asked: "that the Executive discuss with the Department its policy with respect to the revision of the textbooks and syllabuses of instruction, and publish in 'National Education' a report on the procedures being adopted." 3

In replying to this remit in a letter dated August, 28th, 1953, the Director of Education, C.E. Beeby said:

"I am, as you know, anxious that teachers should be fully consulted and kept informed about the progress being made in the revision of textbooks and syllabuses. I shall be happy to arrange as suggested, for an article to be prepared in the Department for 'National Education', summarizing what has been done to date and what is being planned.

On the question of consultation generally, I am willing to set up a Standing Committee of the Institute and the Department that could meet two or three times a year so that:

1. the Institute can be kept informed of the progress being made in textbooks and syllabus revision, and,
2. current problems relating to the primary school curriculum can be discussed. 4

The first meeting of what was to be known as the Primary School Curriculum Liaison Committee was held at the Department of Education on March 5th, 1954. 5

In the course of the meeting, the Chief Inspector of Primary Schools, A.E. Campbell, speaking about the work of the committee said:

"It is not the function of this committee to take the

3. Remit 51 to the Annual meeting of the Institute, 1953.
4. N.Z.E.I. Correspondence file, Letter to National Secretary.
5. The name of this committee was changed to Curriculum Liaison Committee in 1963 when Department invited representation from Post-Primary Teachers' Association."
place of any other committee, nor is it to make decisions, but to pass on information about plans and progress in the field of curriculum. It can be expected that decisions will result from the work that it does. The Department's Curriculum Officer and revision committees are at work on the arithmetic syllabus and the proposed syllabus will be tried out in schools.

A further outcome of the remit was the preparation by the Department's Curriculum Officer of several articles for 'National Education' based on those areas of the curriculum that were at that time under revision.

Before considering further aspects of liaison between the Institute and the Department of Education in syllabus and textbook revision, it is necessary to study the procedure of revision that was current at that time, at how much revision was thought necessary and the reasons given for the revision of the textbooks at this time.

The set of textbooks that were being used in New Zealand primary schools in 1954 were written for use when the syllabus was first issued twelve years earlier. In discussing the reasons for revision, the Department's curriculum officer said:

The type used for the printing of a book does not last for ever. The number of copies required for one of our arithmetic textbooks is such that the type wears out after about seven years. As the type must then be reset, this provides a convenient and economical opportunity to revise the text.

6. Appendices to the minutes of the meetings of the National Executive of the Institute. Appendix, 1954/27.

7. While this is true, it is unfortunate that this was the first reason given in the article for the revision of the textbooks.
He went on to say:

The real reason for it is an educational one; experience brings to light weaknesses in the lay-out, the grading of examples, the presentation of methods, or in other features of the texts and advantage should be taken of the chance to bring about improvements. 

There had been many suggestions for improvements in the textbooks, but with...." the exception of the standard 1 book, teachers seemed to have felt that they were on sound lines." Consequently, while the standard 1 book was almost completely re-written, the changes made to the other books were far less drastic and mainly consisted of changes in format, type, amount of colour printing and size. Documents in the Institute's files indicate that draft copies of textbooks were submitted by the Department for comment by Institute representatives. The Institute's comments were centred around size, provision of answers and the need for guidance to be given to teachers on the use of the books. Very little mention was made of content or of mathematical and teaching theory.

While it was originally envisaged that the Curriculum Liaison Committee should meet..."two or three times each year," the next meeting appears to have been held in November, 1955. The Department, however, had continued with syllabus revision. In an article in 'National Education'

9. Ibid.
10.Apparently the books were acceptable to the Institute on these grounds.
April, 1954, the then Curriculum Officer for the Department of Education, R. Chapman-Taylor, mentioned that "..." various committees located in different parts of the country, (Otago, Std.1; Taranaki, Std.2; Wanganui, Std.3; Wellington, Std.4; Canterbury, Form 1; Auckland, Form 2.) had been established for several years with the purpose of revising the textbooks that were being used at that time." 12 However, at the Curriculum Liaison Committee meeting in 1955, the Institute were advised that a Standing Committee comprising infant teachers, university and teachers' college lecturers, infant advisers and representatives of the primary and post-primary inspectorate, had been set up in Christchurch in 1953 under the chairmanship of J.S. Allen of the Christchurch Teachers' College. The purpose of this committee was to revise the Arithmetic Syllabus, and at that time it was working on the syllabus in primer classes. It seems fairly obvious that this committee was ultimately responsible for 'The Handbook of Suggestions for Teaching Arithmetic in the Infant Classes', but there is no record in the Institute's files of any direct participation by teachers at a national level.

At this time the Department was heavily involved with the printing and distribution of Arithmetic Books 1 - 6 which had emerged from the work of the above committees, a

handbook of 'Suggestions for Teaching Arithmetic in Standard 1 and 2' and work was also proceeding on an Arithmetic Book 7 for which approval had been given in principle. The departmental officer who was mainly responsible at this stage for the handbook was E.R. Duncan, an inspector on schools, and who was to become intimately involved with the present Standard 1 - 4 textbooks (Modern School Mathematics series).

It was not apparent that the Department was considering any further revision of the textbooks or the syllabus until the following year, when, at a Curriculum Liaison Committee meeting held in October, 1957 the Curriculum Officer for the Department stated..."the teaching of arithmetic is at present the subject of much thought and enquiry all over the world and no suggestion that has any chance of being fruitful should be put aside." 13 At this meeting also, E.R. Duncan, recently returned from a visit to the United States spoke of his investigations into arithmetic in American schools.

The activity of the Department in the field of arithmetic was still mainly concerned with books 1 - 6. Institute representatives were shown the new Book 4 in October, 1957 and at the Curriculum Liaison Committee meeting in November 1959 the Department's Curriculum Officer stated..."the last time the primary school curriculum had been revised was in

1929. Since then another revision had been going on subject by subject in a series of cycles but not necessarily in order. Arithmetic had been the first and was not yet 20 years old. Revision only took place when there was an apparent need." 14

The Curriculum Officer went on to outline the plan the Department hoped to achieve in the immediate future. This included middle and upper school handbooks as teachers' guides for use with the present textbooks, a draft of a new manual for number in the infant room and a start on a handbook for Book 7.

The handbooks for the middle and upper school were written in the main by Duncan and visibly demonstrated the influence of his American trip. While these handbooks stood out as offering challenging new approaches to the teaching of arithmetic, few teachers put any of the ideas they contained into operation. 15 The Department was still concerned with Book 5 which was to be distributed to schools in 1960 and Book 6 in 1961.

It was not until the next meeting of the Curriculum Liaison Committee in 1961 that any mention was made of the new Book 7 or the revision of the Arithmetic Syllabus.

15. The proof of this statement could well be that if many teachers had put the ideas contained in these handbooks into operation, the present transition to 'new' maths would not have proved to be such a monumental one.
At this meeting, held on the 22nd November, 1961, R. McFarland, the newly appointed Officer for School Mathematics, reported in progress in mathematics. Book 7 of the primary series was being produced in chapters. The first, which was at this time in draft form, consisted of two booklets; one contained the actual text from which the children would work, and the other, answers and suggestions for teachers.

In the preparation of the first chapter, McFarland had been advised and helped during the previous year by an American Professor, Dr Foster E. Grossnickle, who had visited New Zealand under the sponsorship of the Department of Education. Dr Grossnickle, an expert in the field of Primary School mathematics, spent some considerable time in this country lecturing to teachers and demonstrating teaching techniques with children.

It was decided in 1961, that cyclostyled drafts of the first four chapters of Book 7, which was primarily aimed at extending the brighter children at the Form 2 level, should be used on trial in each Education Board district. Schools were to be selected by the District Senior Inspectors in the pattern of one city intermediate, one country town intermediate and one large mixed school.

J.J. Lee, inspector of schools reported at this

16. Appendix, 1961/153, p.2
meeting on the progress that was being made on the revision of the infant manual. Lee stated that the Department's book 'Number Work in the Infant Room' had been published in 1944 and that revision of the text was begun in 1960, by the Christchurch committee, with Chairman E.O. Lenz, Senior Lecturer in Education, University of Canterbury, who had replaced J.S. Allen. The work of this committee was mainly concerned with the psychology and methods of teaching arithmetic. A first draft of the revision, written by Lee, was presented to a Wallis House committee in March 1961. Dr A.E. Fieldhouse, Professor of Education at Victoria University of Wellington, McFarland and the infant advisers who had attended this course, approved in principle the draft that had been tested in trial schools in Hawke's Bay, and made a number of valuable suggestions.

It became clear in 1961 that the new book would be very much more than a revision of the old. It was based on the principle that children must understand what they do and that to help children to learn arithmetic with understanding teachers must be familiar with the essential arithmetical ideas and the kinds of activities and apparatus that develop these ideas.

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Five hundred copies of the draft handbook were distributed to teachers' colleges, normal schools, senior inspectors, and four pilot schools in each Education Board district and they were asked to report on it. A copy of the handbook was sent to the Institute, but according to all the information available to the writer, this was the extent of the liaison or direct Institute participation in the revision. The trial of the draft handbook was to take place officially in 1962. Following any necessary adjustments it was proposed to publish the completed handbook in 1963. 21

At the meeting of the National Executive of the Institute in January, 1962, the point was made that Institute representation on the Curriculum Liaison Committee should be increased. 22 Only two members had been attending the meetings up to 1961. No reason was given for this sudden desire on the part of the Institute to increase its representation. However it appears that the reason was to prevent Departmental domination of the meetings. 23

In its consultations with the Department on the revision of the arithmetic books, the Institute had not taken a leading role. Admittedly, the Institute had been asked its opinion on the format and size of the recently published

23. Fieldnotes: Interview with Jack Dwyer, National Executive member.
textbooks in arithmetic. It had had some of the suggestions it made implemented, for example, the inclusion of answers in some of the textbooks and guidance notes for teachers.

Although many teachers served on National Revision Committees and many Institute members were involved in trial schools, there appears to have been a lack of liaison between the committees and the Institute's National Executive. It was not until the establishment of the Institute's national curriculum committees that the Institute began to play a major role in syllabus and curriculum revision.

It is significant to note that at the Curriculum Liaison Committee meeting in 1961, where Lee had outlined the progress made with the revision of the infant number book and had stated..."the new book would be very much more than a revision of the old"24, the Curriculum Officer, Chapman-Taylor stated..."no immediate revision of the Arithmetic Syllabus is contemplated, although if decimal coinage is adopted, we will have no option but to revise, though it might be wise to wait for the report of the Commission on Education before initiating new work in this field." 25

This illustrates a confusion which was apparent in the minds of those closely associated with mathematics. Whereas Lee indicated that a near revolution was to take place in

25. op.cit. p.2. (The report of the Commission on Education was on the minds of many people at this time.)
the teaching of mathematics in the junior school, Chapman-Taylor indicated that no immediate revision of the Arithmetic Syllabus was contemplated by the Department.

Amongst teachers there were a few voices 'crying in the wilderness'. For example, Marcus Riske stated in 1961:

I have no doubt that we must face the situation that our upper Primary School arithmetic course is hopelessly out of date and that the continuation of mere 'sums' in the well-worn manner is leaving our students without equipment suitable for the second half of this century. 26

and:

...the world we live in and the one the pupils will work in requires surprisingly little of the skills that we so valiantly try to inculcate. 27

E.W. Evans, writing in 'National Education' in 1959 stated that "a new approach is needed." 28 Articles by Eva M. Kitchener, 29 Noel Amadio, 30 and E.W. Seville, 31 also in 'National Education' all tended to stress the changed approach to arithmetic that was booming in America and England but was not being generally recognised by


teachers in this country. Yet in 1961, the Department ..."did not contemplate any immediate revision."

This lack of foresight probably led to many of the problems cited later in this thesis.

Perhaps the Institute came nearest to being aware of their lessening role in syllabus revision when the President, R. Familton, stated in 'National Education' in October, 1962:

We, as teachers have not been willing to play a full part in directing our profession... teachers individually have played a valuable part in curriculum revision and in trying new schemes in their classrooms, but they have too often been chosen by departmental committees. The Institute has had little to do with such important matters.

At the next meeting of the Curriculum Liaison Committee in November, 1962, the Director of Education, A.E. Campbell, expressed his concern that the National President's statement might give young teachers a wrong impression about the means of communication already existing between the Department and the Institute. He went on to say that the Department was convinced of the value of this co-operation and if it appeared to the Institute that there should be extended arrangements for liaison, the Department was very willing to arrange more opportunities for consultation.

In reply, the Institute representatives said that in the past, and particularly recently, the Executive had not

been close enough to members to be able to put their general point of view, but that they had recently set up permanent Curriculum Committees they hoped would be able to work more closely with the Department on revision of future syllabuses. 35

With so much going on in syllabus revision and so much in the offing, it was obvious to the Institute that something more was needed than the friendly, informal consultation which it had enjoyed. This kind of liaison was still necessary but it was felt that teachers as a group should be more actively involved in decisions on what was to be taught, as they were the ones who would be expected to teach it. This reflects the growing concern of the Institute with professional standards; a concern which is revealed in the desire to play a leading role in syllabus revision.

Today, it is accepted by both the Institute and the Department that the practitioner possesses an unique expertise. The practitioner is the only person who is able to comment with any authority on the practicalities of proposed changes. Furthermore, he possesses a deep knowledge of the way children learn and the classroom situation. 36 But perhaps the most telling reason for practitioner involvement is from the professional point of view. Whoever makes the final decision or writes the final

36. A knowledge that quickly dissipates once an individual leaves the classroom.
draft, the practitioner is professionally responsible for its implementation. For the above reason, he should be involved from the very beginning.

Throughout 1962 Lee and the infant advisers continued to visit all schools where the new handbook on infant number was being tried out. At a meeting of infant advisers and the Department in August much work was done on the revision of basic lists of infant equipment. It had also been agreed that the publication of the book should be delayed until essential equipment was available and that even then, it would be made clear to teachers that they would have time to study the book thoroughly before they were asked to introduce any of the new work into their classrooms.37

The willingness of the Chief Inspector of Schools, J.L. Ewing, to withhold the formal introduction of new approaches in infant number until the equipment was available was viewed by the Institute as somewhat as a victory for them at the time.

It was not until 1963 that "...Government approval for the increase in the basic arithmetic equipment supplied free to all schools..." 38 was obtained. The basic list of equipment for infant classes now included: cuisenaire rods, pattern boards, capacity measures and number lines, all of

which were essential for the successful implementation of
the new number book.

As a result of the Report of the Commission on Education
in New Zealand in 1962, a 'new look' became apparent in the
curriculum field.

The Curriculum Development Unit was created with K.J.Sheen,
who had been the secretary to the Commission on Education,
as Curriculum Development Officer.

At the Curriculum Liaison Committee meeting held in
the November, 1963, Sheen explained that the purpose of
his unit was to develop and co-ordinate primary and post-
primary curricula. He went on to say:

At this stage, the size and composition of the head
office unit was not something that could be laid down
with any finality. Until further officers were
appointed to the Department, the majority of the work
will continue to be done by persons seconded to the
Department. The recently published 'Suggestions for
Teaching Arithmetic in Infant Classes' (AIC) had been
prepared by people experienced in the subject, working
in association with the curriculum officer.

Neither had the methods of work of the Curriculum
Unit been fully worked out. It was clear that members of
the unit would work in the field as well as in head office.
Close links would have to be established between the
unit and in-service training and be maintained with a
wide range of persons, agencies and organisations
within the Department and with the teaching profession
generally.38

Sheen said that he regarded co-operation with teacher
groups as vital. His policy in curricular matters of common
interest would be one of joint consultation with the teachers'
organisations.39

39. Ibid.
The Institute presented their case to this meeting concerning infant equipment, inservice training and the preparation of teachers for the new infant number scheme. At this stage little or no equipment had been issued to schools and only pilot schools had seen the drafts of the handbook. A spokesman for the Department said that the handbooks which could do with close study, would be in teachers' hands at the beginning of 1964 and the equipment would be available in two issues shortly afterwards. The scheme would not be official until 1965.

It was at this meeting that the Department made it clear that the Standard 1 - 4 syllabus which had first appeared satisfactory, would now require revising to bring it into line with the syllabuses for the Primers and Forms 1 and 2. This must have come as quite a surprise for the Institute representatives, as quite obviously the Curriculum officers had been doing a great deal of syllabus revision which the Institute knew nothing about. A Lopdell House course was planned for March 1964 to study the implications of the new infant programme for arithmetic teaching in the junior and middle school. Another factor which had had some influence on the necessity for revision was the projected introduction of decimal currency in 1967.

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40. Of the type mentioned v.supra. p.16
41. Official minutes, C.L.C. meeting, 29/11/63. p. 6
42. ibid.
43. ibid.
The official introduction of the new infant number scheme in 1965 gave ample time for the distribution of the necessary number equipment to schools and for the in-service training of infant school teachers in the new approach. It occurred to some teachers that if any benefits of this new approach were to be received further up the school, something would have to be done about syllabus revision in the Standard 1 - 4 area.

Exploratory work was, at this stage well under way in mathematics in Forms 1 and 2. In fact there was a draft exploratory syllabus being used in some schools which laid stress on helping children to discover mathematical concepts for themselves within terms of reference such that the structure of mathematics should be visible at all stages and that the teaching should aim to bring out the basic concepts and operations of the subject. It was hoped by the Curriculum Unit that a Mathematics Policy Conference, which was to be held at Lopdell House in April 1964 would help to assess the value of the content and methods suggested in this draft syllabus and consequently give a lead to further work in the development of the subject.

It seems obvious that 1963 was an important year as far as syllabus revision was concerned, as this was the year

44. Official minutes, C.L.C. meeting, 29/11/63, p.6.
45. ibid.
in which it became obvious (at least to the Department) that a complete revision of the syllabus in primary school arithmetic was necessary. The two motivating forces appear to be, first, the successful experience of infant teachers in trial schools with the new programme in arithmetic using the methods and materials outlined in the handbook, and second, the proposed introduction of decimal currency in 1967.

By 1964, this indication of commitment was even more apparent. With the general adoption of the new Infant Number Scheme at this point, only a year away, it became more important than ever to expedite developments in the Standard 1 - 4 area of the syllabus.

At the Curriculum Liaison Committee meeting held in November, 1964 the Curriculum Officer for Mathematics distributed, in tabular form, exploratory syllabuses for Standards 1 - 4 which were already being put into operation by some 70 pilot classes at the Standard 1 level. The teachers of these classes were being supplied with cyclostyled notes as supplementary material to the trial syllabus and the Curriculum Officer, through extensive visits throughout the country, was able to confirm the success of the scheme up to the present point. The Curriculum Officer stated that it was planned to extend the work to Standard 2 classes, by invitation, in 1965, when another Lopdell House course,
scheduled for March, would cater for the instruction of teachers. 46

The next phase in the development of the scheme was to consolidate and develop a group of resource teachers from those participating in the present trials. It was felt that, at this time, it was vitally necessary to give 'pilot' teachers induction courses to inculcate confidence in the new approach. In particular there was a need for courses for teachers in the country areas and centres and the development of a corps of resource personnel in these areas. To expedite this, it was planned to hold a six week residential course for selected teachers at Ardmore College in June-July 1965. 47

It was stressed also, that it was important that curriculum development should continue in Standards 2-4, otherwise the benefit of what had been gained in Standard 1 would be lost. 48

At no point in the development of the new mathematics syllabus up to this stage had the Institute questioned either the procedure being followed by the Department in the implementation of the scheme, or the content of the syllabus. Its only interest, apparent in the official files, was that the materials and equipment that had been provided by the

46. Official minutes, C.L.C. meeting, 27/11/64, p.4.
47. op.cit. p.5.
48. op.cit. p.6.
Department as free issue to schools was causing dissatisfaction among teachers as to its quantity and quality and that some teachers in certain areas, were being urged to adopt the new number approach before they were adequately prepared for it.\(^{49}\)

Also at this meeting the Institute Representatives were given a confidential draft of an 'Education Gazette' notice, 'Mathematics in Schools- Recent Curriculum Developments' which was to be published in February, 1965. The opening paragraphs demonstrate the changes that were to come:

Most New Zealand teachers will be aware of the present world-wide trend to re-examine the content and teaching of Mathematics. This re-examination extends from the first principles of arithmetic taught in the Primer classes to the mathematics taught in the sixth form. Conferences held at Lopdell House early in 1964 studied the present position of mathematics in New Zealand schools in the light of changes overseas, and sought to lay down guidelines for development in a subject, the fundamental importance of which in modern society, is widely acknowledged. There are already a number of growing points in mathematics in New Zealand schools, and it would be useful to set down for teachers a brief but fairly comprehensive statement of the reasons for the changes that are taking place, and some information about the ways in which the changes are being guided at various points in the school system. The ultimate aim is a continuous syllabus gradually deepening throughout a pupil's school course.\(^{50}\)

This was the first official statement that changes were to take place. The syllabus was to be officially revised.

The 'Gazette' notice went on to outline the changes in

\(^{49}\) Official minutes, C.L.C. meeting, 27/11/64. p.6.

\(^{50}\) Education Gazette, February, 1. 1965. p.20.
Primary School Mathematics up to Standard 4:

Changes in Primary School Arithmetic come chiefly from the growth of educational knowledge about the ways in which children learn and apply mathematical concepts in schools, beginning with very simple basic ideas which are usually presented to them in practical form. There is no doubt about the help which children gain from specially designed number apparatus such as Cuisenaire equipment, Number lines, Pattern Boards and similar types of equipment through which they may be guided to explore and experiment with number ideas, recognise and discover numerical patterns and relationships and independently form judgements about them. Children in this way come to a real understanding of simple mathematical ideas and gain greater confidence and ease in working with processes and problems. They still need, as before, thorough tuition in the tables of arithmetic that all use in everyday situations, but this goal is being approached in different ways.

An important point to remember about Primary School arithmetic is that it is built up on a system of related ideas that apply not only to arithmetic but equally well to algebra and geometry; these ideas, in fact, are not arithmetical only, but basically mathematical. Most children can understand them and ways of helping less able children to grasp them are being tried out in New Zealand and in most advanced countries overseas.

Teachers of Primer Classes throughout New Zealand have already been able to study and discuss the Department's Handbook, 'Suggestions for Teaching Arithmetic in Infant Classes' and can begin to adapt their programmes in 1965 as items of equipment issued by the Department come to hand. The Primer programme is directly linked with a new syllabus being tried out in some pilot standard 1 classes. In succeeding years, this pilot work will be extended to Standards 2, 3 and 4 and at the same time will be gradually passed on to other teachers. These changes will lead to modifications of existing textbooks and handbooks, and ultimately to the production of revised textbooks and handbooks. The impending change to Decimal Currency will also lead to some changes in the textbook materials.

The 'Gazette' notice goes on to outline similar ideas for Forms 1 and 2, and later still to state that a Secondary

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scheme was being undertaken in about thirty schools, working on an agreed syllabus in Forms 3 - 5. This was to be tested by an alternative School Certificate paper set for the first time in 1965. The last paragraph stated:

The Department wishes to emphasize that in all schools and in all classes, there exists today a challenging opportunity for teachers to explore and master the possibilities of new material in their mathematical teaching. The Curriculum Officers in Mathematics and the Inspectors will do all in their power to help teachers in this work and to foster these new developments. The curricula organisation for the teachers' associations, the teachers' refresher course committee, the subject association for the universities, are all in their way giving their support. A lengthy programme of in-service training will be planned and undertaken but the successful carrying through of the revision of a major subject such as mathematics must depend in the long run on the willingness of each teacher to pursue some individual study, and to grapple in their classrooms with the problems involved. 52

The 'Gazette' notice clearly showed that syllabus revision was in hand and teachers in general were being encouraged to join those who were already working with the new scheme.

In what the Curriculum Development Officer, K.J. Sheen, explained at the November 1964 meeting of the Curriculum Liaison Committee, was an "...establishment year for the Unit", 53 certainly, a lot of syllabus revision had been going on. This included a great acceleration in the building of a programme in mathematics. Pertinent comment from Institute Representative, H.M. Hunter, at the meeting

52. Education Gazette, February, 1. 1965. p.20
53. Appendix, 1964/244.
was "... much more has been going on in curriculum work than we had imagined" and" the sudden activity of the Curriculum Development Unit, has wrested any vestige of initiative we may have displayed, away from us for the moment." 54

It was at this stage that the Institute decided to set up Subject Committees (now known as National Curriculum Committees) as a response to the Department's challenge to the professional status of teachers. While teachers had always been represented on National Revision Committees set up by the Department to revise syllabuses, there was, at least up until 1964, no formal arrangement for a National Executive member to be on the committee and it was not then customary for him to report to the National Executive on the work of that committee. It is understandable that no reports were made, for the member was on the committee in the capacity of a practising teacher, and while he must have had the interests of teachers in the back of his mind, his first commitment was to the committee and to the Department.

Unfortunately, there was no National Revision Committee set up for the revision of the mathematics syllabus. Even as late as 1964, the only information that was generally available to the Institute was made available at the

54. Appendix, 1964/244. p.2.
Curriculum Liaison Committee meeting, and at these meetings it had been the practice for Departmental Officers merely to indicate some of the things they had done and what they proposed to do in the future.

The ultimate strength of the Institute largely depends upon it maintaining a just balance between its professional and trade-union functions. For many years the professional function had been relatively neglected and while the Institute felt that it should have a major voice in formulating the curricula with which its members were charged with interpreting and implementing, it had done remarkably little to increase its activities in the professional field.

In setting up National Curriculum Committees, eventually in all areas of the primary school curriculum it was hoped that the Institute would not only safe-guard its professional status but even enhance it.

Although called National Committees, the members of each committee live and work within commuting distance so that meetings may be held regularly and so that they may get to know each other well. Often, corresponding members are selected from other parts of the country so as to be able to sample teacher opinion and expertise from a wider field. The National Curriculum Committee for Mathematics, Infants to Standard 4 has a corresponding member in Wellington.
Chapter 2.


The Institute's National Curriculum Committee for Mathematics, Infants to Standard 4, was appointed by the Executive late in 1965. It was composed of teachers' college lecturers, headteachers, senior assistants, country teachers, and junior school teachers under the Chairmanship of J.P.H. Ross, lecturer at Hamilton Teachers' College. The members of the committee were appointed on the recommendation of J.G. Garvey, at that time a member of the National Executive of the Institute. Garvey selected the members of the committee because of their interest in arithmetic and because of their professional qualifications and expertise in the subject area.

Although called National Committees, the members of each committee live and work within commuting distance so that meetings may be held regularly and so that they may get to know each other well. Often, corresponding members are selected from other parts of the country so as to be able to sample teacher opinion and expertise from a wider field. The National Curriculum Committee for Mathematics, Infants to Standard 4 has a corresponding member in Wellington.
The Functions of National Curriculum Committees.

The committees are deliberative and advisory. As they do not enjoy executive functions they often include secondary or tertiary stage teachers, especially where vertical continuity in the curriculum field is necessary.

Purposes:

The major purpose for the establishment of the committees was to increase the professional status and influence of the Institute through the evaluation of educational objectives, of current syllabuses and practices, of proposed revisions and of the adequacy of equipment available to teachers.

Specifically, in its area each committee is concerned with:

1. vertical and horizontal continuity;
2. an appraisal of overseas research and practices and their relevance for New Zealand;
3. liaison with other educational agencies, e.g. pre-school, university, secondary, teachers' colleges, New Zealand Council For Educational Research, Curriculum Development Unit;
4. evaluation of the content and use made of handbooks, textbooks, teachers' guides issued by the Department;
5. subject time allocation and the necessity for the provision of advisers;
6. to act as Institute advisers in the subject
and to transmit to the Executive the opinions of the practitioners.

The Activities of the National Curriculum Committee for Mathematics, Infants to Standard 4.

In the first interim report, dated December, 1965, to the Executive, several points were noted.

The committee felt that from investigations made within their area (Hamilton), the schools and classes in which the trial syllabus was being developed were not receiving the same material in the form of guidance notes and lists of material suitable for use in an arithmetic programme. It must be pointed out here that this committee had a considerable backlog of work. As far as the arithmetic programme for the infant classes was concerned, it was at this stage officially almost one year old. The committee had had no hand in helping to formulate this programme nor in the programme that was being operated in many pilot schools at the Standard 1 level. The role of the committee could not at this stage be very constructive as far as teachers were concerned. However, if they felt insecure in what they were doing, there were many teachers and headteachers in pilot schools who felt even more so.

The committee found that many of the headteachers and teachers concerned with the trial scheme in the Hamilton area were receiving insufficient guidance. The teachers met
often to help each other interpret the notes sent out from the Department, and while this was desirable, it was often a case of the blind leading the blind. To compound the problem of the pilot schools, there was a lack of continuity within some of the pilot schools themselves. The committee found evidence of schools not having all the classes at the Standard 1 level working on the trial syllabus when all of the children had worked through the trial syllabus in the infant school. 1

From the point of view of the trial syllabus the committee had two recommendations to make:

1. There appears to be a greater need for co-ordination, guidance and supervision from the Curriculum Development Unit to ensure that: all teachers and headteachers concerned with the trial syllabus receive complete sets of notes and are provided with sufficient guidance; continuity within a class and from class to class is maintained. 2

The committee noted that the implementation of such a recommendation would ensure that the work in the pilot schools would be fairly evaluated within the normal classroom conditions of work and that any changes to be made could be justified on this basis.

2. That advisers in arithmetic be appointed. 3

The committee believed that advisers could help to achieve the conditions desirable for the implementation of the new

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1. Appendix, 1965/89.
2. Ibid.
3. Ibid.
syllabus. The advisers would work with the Curriculum Development Unit and bring material from the unit to the trial teachers and help them interpret it. They would arrange and guide meetings of trial teachers and help them to help themselves in this work. They would supervise classroom work in trial schools, assist teachers and headteachers in schools, report to the Curriculum Development Unit on problems and progress and finally they would develop continuity in trial schools by assisting teachers and headteachers to pick up the threads and carry on from those who leave.

The committee also envisaged a role for the advisers beyond the stage of the trial syllabus. They felt that the advisers would be of great value in the planning of appropriate in-service training courses for teachers in the particular areas in which they were to work. Teachers involved in the adoption of the new syllabus, and this would be all the teachers, would have a variety of needs. These needs would become progressively more demanding as the teaching of the new syllabus developed. The role of the advisers would be to meet these needs as they arose by planning basic courses, perhaps utilizing any 'trial-school' teachers who were in the area, and later initiating follow-up courses to build up the confidence of teachers so that the teachers in each area would feel that expert help and advice was

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was readily available when required. \(^5\)

Basically the job of the advisers would be to give as much help as possible to the teachers in the schools.

Because the new mathematics syllabus that was on trial at this time was concerned with the development of logical thinking and the study of basic principles with the pupils being given the opportunity to discover the principles as they operate in easy examples, the need for a wide variety of equipment such as structured material was apparent.

The Department was fully aware of this and provisions were made to supply schools with the material needed. Government approval had already been given for an increase in the basic equipment list issued free to schools. \(^6\)

However, The National Curriculum Committee had evidence that the material supplied was inadequate and that even the Department was aware of this fact. \(^7\) Pilot schools had been forced at this time, to buy a lot of basic equipment to facilitate the operation of the trial syllabus. However, in all fairness, the National Curriculum Committee did note that a conflict of opinion appeared here and that some schools had found that the equipment supplied was just about adequate for their needs. The question of adequacy of equipment depended to a large extent on how the equipment was used.

\(^5\) Appendix, 1965/289
\(^7\) Appendix, 1965/289.
shared and used within a school. Organisation of time-tables for mathematics could reduce the quantity of equipment that was necessary to implement the trial syllabus.

The committee's report indicates that the pilot scheme was facing some considerable problems in the beginning stages and was receiving only a minimum amount of guidance. The assumptions of the committee were later confirmed in a comprehensive survey carried out by the Institute's Curriculum Officer, P.D.K. Ramsay, which is summarized later in this thesis.

In January, 1966 two National Refresher Courses were held for teachers at King's College, Auckland and at Lincoln College in Canterbury on the topic, 'Teaching Arithmetic in Standards 1 - 4'. While no recommendation to the National Refresher Course Committee was forthcoming from the Auckland course, what was to be a very important recommendation, was made at Lincoln, namely:

That wherever possible, the work of this course should be extended to all the school areas concerned. To further this recommendation the course suggests that the Department appoint Specialist Advisers in Primary Mathematics to each Education Board area.

It seems obvious that teachers who were aware, at this stage, of the incipient changes in the Arithmetic Syllabus were also concerned with the tremendous task of teacher re-training that would have to be put into operation.

Advisers in mathematics were seen to be the 'sine qua non' of an effective re-training programme.

Significantly, when the question of availability of mathematics advisers was raised formally with the Curriculum Officer for Mathematics, R. McFarland, by the National Curriculum Committee for Mathematics, Infants to Standard 4, McFarland stated that he believed that at this time the service did not have the trained people available to do this work, and in any case, most teachers were not ready for this concentrated guidance. 'Teachers,' he said, 'needed to grow slowly towards the approach in the initial stages.'

The notes of the Curriculum Liaison Committee meeting for 1965 make no reference to the proposed new syllabus for infants to Standard 4 mathematics, or of the possible purchase of a set of new textbooks from which teachers could teach the syllabus.

At some time early in 1965, however, the Department must have entered into some even tentative negotiations with E.R. Duncan and the publishers Houghton Mifflin, as during the Institute's Executive meeting with the Department on 17th January, 1966, the Director of Primary Education, B.M. Pinder stated:

The Government had approved in principle, negotiations for the purchase of books from an American publisher. Certain sections will be recast for New Zealand
conditions, although American spelling will occur throughout. The Standard 1 and 2 books should be in schools in the first term of 1967, and the Standard 3 and 4 books in 1968. 11.

In August, 1966, the National Curriculum Committee was asked by the Department to consider the Standard 1 - 4 syllabus in mathematics as outlined in the Trial Syllabus and Notes. After a brief perusal, the committee had this comment to make:

The Committee approves the principles on which this syllabus has been constructed and believes that the application of these principles as proposed are sound. Some tidying-up of the mass of notes will be necessary before a clear and concise statement can be made available to teachers, but with this qualification, we would agree that what is being attempted and proposed is a most commendable approach to the teaching of mathematics in Standards 1 - 4 and flows well from the handbook, 'Suggestions for the teaching of Arithmetic in Infant Classes. 12

In the same report to the National Executive there was a report on the 'sample' textbooks made available to the committee by the Curriculum Development Unit.

The National Curriculum Committee, after discussing the 'sample' textbooks with the Curriculum Officers for Mathematics, R. McFarland and J. Cox, recommended that the Institute approve these texts for purchase as it found the books most suitable.

The Committee went on to say..."It would be desirable really to have a New Zealand publication, but when the difficulties involved in publishing and the time factor

are taken into account there is no doubt that this overseas
publication is a worthy substitute." 13

To give some idea of the 'sample' books that were
given to the Committee for comment and the discussion with
the Curriculum officers the report also recommended:

1. that some consideration be given to the titles of the
   books. Mathematics rather than arithmetic should be
   used in the title;
2. that a title which suggests a progression could be
   used;
3. that the handbook, 'Suggestions for Teaching
   Arithmetic in Infant Classes' be considered as the
   first teachers' handbook in the series and thereafter
   the books be numbered consecutively;
4. that a 'flow' chart be provided for the whole series;
5. that the teachers' manuals be distributed with the
   pupils' texts. 14

The Committee was concerned that there was some degree
of overlap with 'Suggestions for Teaching Arithmetic in
Infant Classes', but that there was the need to compromise
in order that no real obstruction be raised to the 'whole
deal'. It also felt that some of the deletions would
obviate the necessity to supply supplementary material and
this was not desirable at the beginning of the issue of a
new series of textbooks. 15

The Committee stated firmly that the distribution of
the new textbooks should be an uninterrupted flow, as a
break in the distribution could mean a breakdown of the
whole scheme. 16

13. Appendix, 1966/224
14. ibid.
15. ibid.
16. ibid.
It was certain at this stage that there was a growing level of liaison between the National Curriculum Committee for Mathematics and the Curriculum Development Unit and at this time the Committee was really beginning to fulfil one of its major functions. The Institute had been given the right to examine the 'sample' texts and the opportunity to comment on them in, however, less than a month and the Committee felt that much of the value of the liaison was lost when so little time was made available for examination and comment.  

In spite of this the Committee believed that this particular series was as good as any available at the time and was certainly consistent with the approach being adopted to the teaching of mathematics in Standards 1 – 4. It went on to say...."nothing like it could be produced in New Zealand for many years and therefore teachers have a great advantage, as there is a need for such books and guidance immediately."  

Later in the report the Committee emphasized again the need for structured material and other equipment to go with the new textbooks. "We believe that the Institute should have established the principle that the purchase of these books shall not effect the supply of other materials, e.g. structured materials, for mathematics teaching... the

17. Appendix, 1966/224. p.3  
18. Ibid. p.4
the principle needs to be established with the Department, as the need for structured materials and other aids is greater than ever. Failure to supply these on an increasing scale will reduce the advantages to be gained from the use of the new textbooks." 19

Once again the Committee urged renewed efforts to have full-time advisers appointed in each Board area.

The need for this kind of assistance with the introduction of the new series of books and the new syllabus is emphasized, if we are to gain full advantage from them. It is suggested that the handbook for teachers could be used as the basis for the in-service work which these advisers would conduct. 20

From the use of advisers the Committee felt that teachers would become aware of the changed approach, of the need to use the handbooks alongside the pupils' texts and of the wealth of guidance offered in these handbooks.

More recent conversations with R. McFarland indicated that at this stage, the objections he had previously held to the appointment of advisers were not as cogent. 21

While this thesis has been primarily concerned with the introduction of the new syllabus in mathematics into the lower classes of the primary schools and the extent of the liaison between the Institute and the Department on this issue, it is becoming more obvious that with the establishment of its own curriculum committees the Institute was involving itself more in curricular matters. By October, 1966, there

20. ibid.
21. op.cit. p.4.
were National Curriculum Committees in: Mathematics, Forms 1 and 2; Social Studies; Science; Foreign Languages; Music.

The extent of this involvement resulted in what this writer believes to be the Institute's most significant contribution to increasing its professional status, the appointment of its own Curriculum Officer, P.D.K. Ramsay.

Unit, as recommended by the Commission on Education in New Zealand in 1962, that accelerated the Institute's participation in the field of curriculum development and planning.

The Commission recommended:

...in order to deal with curriculum and syllabus problems of the immediate and more distant future, the establishment, within the Department of Education, of a section for curriculum development..., whose major responsibility will be to organize and carry out with the assistance of field and research officers the preparation, co-ordination and revision of curricula and syllabuses from the infant department to Form VI.

In outlining the membership and procedure of the Curriculum Development Unit, the Commission undoubtedly gave the Institute the impression that what it envisaged was a corps of experts making decisions, a body of field officers supervising the execution of the curricula so decided and the teachers merely doing what they were told.

To some extent, this approach to curriculum change and development was justified by the Commission. Since the early 1950's the overall academic level of the students

Chapter 3.

The Appointment of the New Zealand Educational Institute's Curriculum Officer.

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To some extent, this approach to curriculum change and development was justified by the Commission. Since the early 1950's the overall academic level of the students

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entering training college had reached its lowest ebb. Recruitment during these years was from among young people born in the years of low birthrate, the years of the early and mid-thirties, and not enough suitably qualified applicants could be attracted to the Division A course. In none of the six years between 1951 and 1956 was it possible even with the utmost relaxation of standards of both academic and of personal acceptability for training to fill the annual quotas...  

The responsibility for forward-looking participation in curriculum change rested on teachers whose academic and professional preparation was not as high as desirable. Within the classroom situation these teachers were doing a good workman-like job, ably supported by a multiplicity of Departmental handbooks. They were building up a fund of professional knowledge and skills which to some extent could be under-estimated by the exaltation of subject matter by Departmental Officers selected in particular areas. As was noted earlier, the Institute's response to the Curriculum Development Unit was the establishment of curriculum committees in the various areas of the curriculum. This was also an attempt on the part of the Institute to improve its professional status and responsibilities. It was obvious to the Institute that the Department had adopted a policy of continuous curriculum change with the appointment to the Curriculum Development Unit of specialist officers in most areas of the primary school curriculum.

After the establishment of these Curriculum Committees

and the limited recognition of these by the Department, the Institute felt that, at this stage, a more desirable climate towards curriculum revision could be fostered by the secondment from time to time of a practising teacher to the Department, who could meet classroom teachers on even terms, accept their reservations and the problems they meet and explain these to those officers who were more closely involved in the shaping of any revision: the Curriculum Development Unit, the National Revision Committee and pilot teachers. The Institute was convinced that if teachers could feel that they were to be consulted closely at each stage, were to have an effective voice in the decisions made and that many of the suggestions had come from practising teachers and were generally approved by them, there would be more teachers interpreting the change with insight, and implementing them with conviction and enthusiasm.

In summary the functions of the 'seconded teacher' were to be as follows:

1. To work for the Department of Education in a seconded capacity for a limited period during the critical stages of revision of specific curriculum areas.
2. To facilitate two-way communication, to assess needs of teachers and children, to garner reservations, criticisms suggestions and overcome problems and misapprehensions of teachers.
3. To inspire confidence and give reassurance to teachers that their views are given full consideration.
4. To assist in in-service work as a resource person in conjunction with inspectors of primary or secondary schools.
5. To facilitate smoother vertical continuity by pinpointing problems of articulation.
6. To report to the Executive on the problems and suggestions so that the organisation may bring publicity to bear, where, after consultation with the Director of Primary Education, it is considered desirable. 3

While it is a fact that the concept of a 'seconded' or 'liaison' teacher appointment became Institute policy:

That the Executive ask the Department to accept its nomination of a teacher, seconded on an annual basis, to act as liaison between the Institute and the Curriculum Development Unit of the Department. 4

Agreed to.

A further motion, that was likewise agreed to stated:

That a report be presented to Annual Meeting, 1966, recommending that a Curriculum Officer be appointed to the Dominion Office. 5

It was recognised in the latter motion that the position of a 'seconded' teacher would be an unenviable one. It would be impossible to serve two masters.

The report presented to Annual Meeting, 1966, set out quite clearly the role that the Executive of the Institute had foreseen for the Institute's Curriculum Officer. It recognised the importance of the establishment of the National Curriculum Committees but admitted that the task of over-all co-ordination of the functions of these committees had become beyond the capacity of the Executive which after all was an elected body whose members had

5. Ibid.
limited time beyond the duties of school and community to give to this work. 6

The appointment of a full-time officer whose major responsibilities were in salaries and related matters during the previous year had proved to the Institute that a specialist full-time officer at Head Office could not only leave Executive members free to decide matters of policy and strategy, but also that the detailed research and study that such an officer could bring to bear on negotiations was an important factor in the success of such negotiations.

The functions of the Curriculum Officer were outlined as follows:

It would be the function of the Curriculum Officer to work closely with the Department's curriculum officers and thus gain a first-hand knowledge of their plans and proposals. He would study curriculum developments, their theory and practice in overseas countries. One of his major functions would be keeping contact with the Institute's national curriculum committees and establishing proper communications between them and the curriculum officers in the Department. Perhaps his most important work would be with teachers in the schools. He would visit pilot schools and report directly to the Executive on the experience of teachers engaged in special projects, and would visit teachers in other schools to study the extent to which curriculum projects are indirectly affecting their work. Adequate supplies of books, materials and equipment would also come within the Curriculum Officer's field of study. 7

It is interesting to note that the Executive, in its

foresight, had actually budgetted for the years 1966 and 1967 for the appointment of such an officer, and this factor could have been significant when it came to the approval of the recommendation by Annual Meeting.

The recommendation: "That a Curriculum Officer be appointed to the Institute office staff with professional and liaison responsibilities to be determined by the National Executive" 8 was approved by Annual Meeting and the position was advertised throughout New Zealand.

With the appointment of P.D.K. Ramsay to this position, the initial step was made to put into operation, the Institute's policy of curriculum development.

In his first year of office, the Curriculum Officer saw as his fundamental task, the involvement of as many teachers as possible in curriculum development. This was a reflection of Institute policy. As a consequence, the Curriculum Officer and the Executive members not only took steps to re-invigorate the National Curriculum Committees and to improve lines of communication, but to also work out a technique for involving teachers at branch level. This involved the establishment of branch sub-committees, a suggestion which was approved by the Executive in April, 1967. By the end of the year the Curriculum Officer was able to write in his first annual report as follows:

The concept that a healthy and active curriculum depends upon its co-operative development is widely accepted.

overseas, and is gaining increasing acceptance in this country. The term 'co-operative' is a vital one; it implies co-operation between the controlling body and the general practitioners. Indeed, overseas experience reveals that the greater the activity of the practitioner, the higher the standard of the final syllabus and the greater the quality of the educative process.

The Institute policy for some years has decreed that the initiative for syllabus revision may come from any number of sources, including practising teachers. However the opportunity for such involvement has been limited. Since 1967 there have been two major advances in this area. The first was the appointment of a full-time officer to the permanent staff of the Institute solely charged with curriculum affairs. The second was the development of a curriculum framework, and a more frequent interchange of ideas and views with the Department of Education. 9

The framework that was established was essentially a simple one. It provided for a continuum from the classroom, the experimental level, to the national level.

The initial steps in setting up this framework, said Ramsay, was the establishment of National Curriculum Committees, regionally based, in the various subjects of the curriculum. But while the number of these has been enlarged so that all subjects in the curriculum can be encompassed, an attempt was made, through the establishment of Local Branch Subject Sub-committees to reach the expertise and opinions of the teachers in the classroom. 10

It is these Branch Sub-committees that are the base of the pyramid framework of the Institute's role and involvement in curriculum development. In general it has

10. Ibid.
been left to each Branch of the Institute to decide for themselves the composition and the number of sub-committees that they wish to form. It was also suggested that each of these sub-committees should have a member of the Managing Committee of the local branch as its liaison with the local branch.

"The function of each sub-committee," said Ramsay, "is to gather as much information as possible from practising teachers through informal interchange of teacher opinion or through workshop meetings designed to concentrate on a specific topic. This is a field which could vitally interest and concern all teachers and increased involvement on their part can only lead to the strengthening of the professional status of the Institute." 11

As these sub-committees have direct access to the next major group, the National Curriculum Committees, they represent the 'grass-roots' of a determined effort by the Institute to get active teacher involvement in curriculum development.

The National Curriculum Committees, whose personnel have been chosen for their expertise in the specific syllabus area, are responsible for advising the National Executive. They serve as a 'filter', passing on advice, comments and recommendations through the Curriculum Officer and at the same time they provide direct lines of communication to the sub-committees and to the body of practising teachers.

This framework for syllabus and curriculum development was adopted by the National Executive and has been progressively put into operation during the past two years. Together with a more clearly defined policy on curriculum revision, it has formed the platform from which the Institute can negotiate with the Department on curriculum matters. That this is so, tends to be borne out in the succeeding sections which are concerned with the more recent activities of the National Curriculum Committee for Mathematics, Infants to Standard 4, the distribution and supply of the necessary structured material and equipment for the satisfactory implementation of the new syllabus and textbooks and the role and functions of pilot schools in the development of a trial syllabus.

Primary Education stated that..."Government had approved in principle, negotiations for the purchase of books from an American publisher." 2 At the Curriculum Liaison Committee meeting held on the 26th October, 1966, Department representatives announced the introduction of the "Modern School Mathematics" series as the new official textbooks to be distributed to schools. The Assistant Curriculum Officer, J. Cox indicated the areas of use for each book and stated that the teachers’ books should be in use

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1. V. supra, p. 193.
Consultation on the Proposed Syllabus and Textbooks.

During 1966, two major steps were taken with regard to the introduction of the new mathematics syllabus. The first, which has already been discussed, was the submission by the Department of Education of the proposed Standard 1 - 4 syllabus as outlined in the Trial and Exploratory Syllabus notes and the 'samples' of the textbooks to be used, to the National Curriculum Committee for Mathematics, Infants to Standard 4. The second, was the decision to purchase a set of textbooks for Standards 1 - 4.

As mentioned above, in January, 1966, the Director of Primary Education stated that..."Government had approved in principle, negotiations for the purchase of books from an American publisher." At the Curriculum Liaison Committee meeting held on the 28th October, 1966, Department representatives announced the introduction of the 'Modern School Mathematics' series as the new official textbooks to be distributed to schools. The Assistant Curriculum Officer, J. Cox indicated the areas of use for each book and stated that the teachers' books should be in New

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1. v. supra. p.35.
Zealand in March or April 1967. These books would be available for study by teachers while they were working through the Decimal Currency Handbooks which had already been distributed. The Officer for School Mathematics, J. Struthers, outlined a tentative phasing-in of the new syllabus. Standards 1 and 2 would commence in February 1968 and Standards 3 and 4 in February 1969. This outline showed also the concept of a natural development of the mathematics syllabus. The Standard 1 - 4 syllabus would be continued through a Form 1 and 2 syllabus, already in operation in certain schools, into the existing Form 3 to 5 pilot system. At this point in time, there were some 46 schools involved in the secondary pilot scheme, including one in Suva.

The National Curriculum Committee for Mathematics, Infants to Standard 4 had, as we have seen, emphasized the need for structured material and other equipment to be issued with the new textbooks, and at this meeting with the Department, the Institute representatives again stressed this need and pointed out the inadequacies of the Department's scheme for the distribution of such materials, especially the 'ceiling supply' of materials for schools larger than ten classrooms. They felt that the supplies should be

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4. Minutes, C.L.C meeting, 28/10/66, item 5.
5. Basic equipment for State Primary and Intermediate schools divides schools into five categories (I - V) according to the number of classrooms. Equipment group V contains ten and above classrooms.
sufficient to make the materials realistically usable and a
attempted to convey to the Department the fact that
teachers were concerned about this. 6 No agreement was
reached, nor was there, at this stage, any statement from
the Department on this issue.

At the beginning of 1967, at the insistence of the
Institute, the Department attempted to clear up the
confusion which was beginning to grow in relationship to
the development of the new syllabus and the approach to
mathematics. An 'Education Gazette' notice of some
importance appeared on January 16th 1967, under the heading,
'Pilot Scheme Mathematics'. The notice dealt mainly with
developments in the secondary service, but in the middle of
the notice, the following quotation is important:

At the same time, developments in mathematics have
been taking place in primary and intermediate schools. The modern mathematics syllabus will come into use for
Standards 1 - 4 during 1967 and 1968, and new text-
books on modern lines will be provided. A draft
syllabus for Forms 1 and 2 has been drawn up and it
is possible that this syllabus may be introduced
from the beginning of 1968. This means that all
secondary entrants in 1969 and 1970 will probably
have had an introduction to new aspects of school
mathematics, and that with subsequent intakes the
transition from traditional to the newer mathematics
will eventually become complete. 7

This was the first official indication to teachers,
apart from the 'Gazette' notice in 1965 8 of the

Department's intention to carry on with the implementation of the mathematics revision. It must be noted here that it had been planned to extend the pilot class scheme to Standard 2 in 1965 by invitation. What actually happened to the pilot scheme in 1965 and 1966 is far from clear. One instance is known of a teacher who was asked to participate in the pilot scheme at the Standard 4 level at the beginning of 1967. Apart from attending a Lopdell House course on Standard 4 mathematics early in 1967 and receiving one Curriculum Unit Bulletin during the year, he has neither been contacted by the Curriculum Unit nor asked to report on his experiences to date. Many other instances of this have been made available to the writer.

Following the meeting of the Curriculum Liaison Committee in October, 1966, a draft mathematics syllabus for Infants to Standard 4 was submitted to the Institute's National Curriculum Committee in December, 1966, by the Curriculum Development Unit officers for comments and suggestions. This was the first concise statement of the proposed new syllabus presented in one document. The content and format of this confidential draft were considered very carefully by the committee and the Assistant Curriculum Officer, J. Cox, travelled to Hamilton to discuss its contents.

The National Curriculum Committee agreed that the draft syllabus was a reasonable summary of recent developments in the field. In their report the committee was complimentary towards those responsible for the preparation of the document. Naturally there were some minor alterations in content and detail recommended by the committee and these were discussed with Cox. Where these appeared helpful Cox was most willing to make the necessary alterations.

There were two major areas of discussion on which the committee reported fully to the National Executive. The first involved the developmental sequence of ideas and the class divisions within the syllabus. The Committee felt that, although the mathematical ideas in the syllabus were traced sequentially in each succeeding class level, it might be a more positive lead to teachers to divide the syllabus up on the basis of the mathematical ideas involved to show the expected developments in each of these at the various class levels. The advantage in this approach would, the committee believed, be, that teachers would not feel as much pressure on them to teach any given class the stated progressions. "The provision of a 'flow' chart in the handbooks will to a large extent overcome this problem," said the committee, but they felt that some mention should be made of the way the syllabus should be...

12. ibid.
interpreted, with perhaps the sequential treatment of one idea being included as an example.

It has been traditional for the Arithmetic Syllabus to be a concise document concerning only what is to be taught at any particular level or to any particular class. How the syllabus should be taught has, in general, been left to teachers themselves to develop. While this has often engendered imaginative methods which could be justified by results for some teachers, the majority followed the more formal approaches which had been built up through practice and discussion with their colleagues. There was security for the teachers in these more formal methods and they were often persevered with in spite of alternative methods provided in handbooks of suggestions published by the Department of Education. In all fairness, it must be pointed out that on the whole teachers did a commendable job in teaching the syllabus. In many schools though, the handbooks of suggestions got no further than the headteacher's office.

A feature of the draft syllabus that appealed to the National Curriculum Committee was the notes on relevant materials that could be used and the methods and examples showing their operation, particularly in the early sections at the Infants to Standard 1 level. The committee felt that these could well be extended and developed at the Standards
2 to 4 level as it was here that teachers needed more encouragement and assistance in the use of concrete materials. The committee stated:

"...we consider it a positive move to include them. Because there is a great need to break traditional thinking, we feel that if the 'asides' are to be retained in the sections relevant to the junior school they must also be added for the middle school. Otherwise, this syllabus could appear to confirm the present practice of neglecting such aids and teaching approach once the children leave the junior school. In fact, we recommend that a general introductory statement on the use of concrete and representational materials could be included at the beginning of each level."

While it appeared to the committee that the Assistant Curriculum Officer followed this line of reasoning and probably found little fault with it...

he expressed some concern at our demands. This appeared to be based on a fear that such entries might be misconstrued as a Departmental ruling that such materials be used in the middle school and that this in turn might lead to the demand for further supplies of materials. It was indicated that any such demands might jeopardize the implementation of the syllabus.

To the committee it appeared that the distinction between encouraging teachers to use sound methods and appropriate materials without asking for them to be supplied and giving them a positive suggestion which leads to the request for such teaching aids, was a very fine one and it indicated that it was not prepared to give ground.

14. ibid.
15. ibid.
on this important matter of principle. The committee was convinced that such a sound statement as this draft syllabus should not be compromised on the basis of supply of equipment. The committee understood from previous meetings with the Department's curriculum officers that the supply of sufficient and increasing quantities of equipment was a separate and agreed issue and ended their report to the National Executive by saying;:

"Indeed, the purchase of texts and the publication of the syllabus will lose a great deal of impact if the necessary equipment is not made available." 16

The question of the supply of structured material was to become an important issue with the Department once the purchase of textbooks had been decided and the syllabus was still in draft form. Two more drafts of the syllabus were submitted to the National Curriculum Committee before it was to go to the printer and these will be dealt with in later section.

At this stage the Institute's efforts, through its National Curriculum Committee for Mathematics, Infants to Standard 4 was centred around two major issues; the supply of structured materials to schools and further drafts of the syllabus. Negotiations were to continue for the next two years, with greater pressure being exerted by the Institute to achieve the satisfaction of its demands.

Chapter 5.

The Provision of Equipment.

The supply of equipment to primary schools in New Zealand has long been a source of dissatisfaction for teachers. From the time it was first realised that the work of the Christchurch committee under the chairmanship of Lenz and the draft of the new handbook for infant school arithmetic written by Lee was going to result in more than just a revision of the existing handbook, it became apparent that it was going to be necessary to supply schools with apparatus to help develop the ideas that were inherent in the new handbook.

During 1962, Lee and the infant advisers visited all the schools where the new handbook was being tried out and in August of that year they met to discuss and revise the basic lists of infant equipment. At a meeting with the Institute's Executive in January 1963, J.L. Ewing, then Chief Inspector of Primary Schools, stated that the Department would not introduce the new infant number scheme or issue the handbooks until 1964 and not then, unless the Department had authority for funds to buy the necessary equipment. ¹ The Executive of the Institute felt at this

¹ Notes of informal discussion between the Executive and Department in January, 1963.
time that the new infant number scheme should be delayed until 1965 as the teachers were still involved with the new Reading Scheme and they would therefore be unable to cope with a new revision until 1965. Ewing said at this point that the Department might issue the handbooks, providing that the purchase of the equipment was authorized, but that the official introduction of the new scheme would be delayed until 1965.²

In 1963, the Department issued to all schools their basic list of equipment for state primary and intermediate schools. This list recognized the needs of the infant school in relation to the ideas that were inherent in the new number scheme and while teachers in infant classes were still experimenting, the amount of equipment supplied was satisfactory. At the Curriculum Liaison Committee meeting held in November 1964, the Institute's representatives made it known to the Department that there was considerable dissatisfaction among teachers as to the quantity and quality of much of the number equipment supplied for infant number. The groups into which the schools were classified for issue of materials created an anomaly in the case of decapitated schools which had correspondingly larger infant departments than other schools of the same size. Some of the items on the schedule of issue were not

² Notes of informal discussion between the Executive and Department in January, 1963.
being supplied and schools were spending their own money on the purchase of them. Most schools at this stage were having to buy equipment to supplement the Department's issue and in many cases there was a discrepancy in size. 3

With the movement of the Curriculum Development Unit into the revision of the Standard 2 - 4 mathematics syllabus in 1965 through pilot schools 4 it was found that the basic supply of equipment for infant number would not in most cases, stretch adequately beyond Standard 1 unless it was possible to timetable mathematics in such a way as to be able to stagger the use of the equipment. Because of the possessiveness of some Infant teachers (after all the equipment was classified as infant equipment) and the general impracticality of such timetabling in some schools many of the pilot schools found that they were having to spend their own money to implement a syllabus which was at this stage still on trial.

In the October 1966 report of the Institute's National Curriculum Committee for Mathematics, Infants to Standard 4 the committee stated that they were convinced that the need for structured materials and other aids was greater than before. "Failure to supply these on an increasing scale,"

4. op.cit. p.5.
they said, "will reduce the advantages to be gained from
the use of the new mathematics series." 5

Following close behind this point of view came a
resolution from the Otago Branch of the Institute which
was forwarded to the National Executive. This resolution
asked:

At the next meeting of the Standing Committee of the
National Executive, the Executive's reaction to this state-
ment by Pinder was translated into an instruction to the
Institute to prepare a report on the findings of overseas research on the use of structured
materials and to make recommendations for subsequent action
on the matter. The report was submitted to the National
Curriculum Committee, a copy of which was referred to the
Director of Primary Education, B.M. Pinder when he
next met with the Executive. At this meeting the Executive
asked that adequate supplies of structured materials should
be available to schools in relation to the new scheme; it
sought consultation with the Department in this point and
emphasized the need for this structured apparatus right up
to the Form 2 level in primary schools. 7

Pinder was not enthusiastic about the provision of
structured materials and disputed the Institute's proposal.
He mentioned that there was some difficulty in defining

5. Appendix, 1966/244.
6. Institute Correspondence Files. Letter dated 31/10/66.
what the word 'adequate' means in this context.

There was a wide divergence of opinion among headteachers on the 'adequacy' of the supply of structured materials at present and the Department thought that there was a lower claim for this material in Standard classes. The Americans use little structured material and anyway, it is unlikely that the Government would consider a request for, say, £100,000 worth of structured material this year. 8

At the next meeting of the Standing Committee of the National Executive, the Executive's reaction to this statement by Pinder crystalized into an instruction to the Institute's Curriculum Officer to prepare a report on the findings of overseas research on the use of structured materials and to make recommendations for subsequent action on the part of the Institute.

The Curriculum Officer's findings were reported in Appendix, 1967/63 which was referred to the National Executive at its May meeting and later published in the July and August issues of 'National Education' under the title, 'N.Z.E.I. Survey of Research on Structured Apparatus Conducted Overseas'.

This well-documented report, which investigated the more recent findings of educational psychologists and general psychologists, the opinions of mathematicians and experts in the field and teacher opinion overseas, abstracted the following generalizations:

Children using structured material usually make gains over traditional groups, especially in conceptual

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maturity and in arithmetical skills. Teachers experienced in both fields generally prefer the structured approach. Teacher opinion is critical in the selection of equipment for the teaching of mathematics. Expert opinion overwhelmingly favours its inclusion, both as a demonstrable tool and as a means for allowing children to discover the concepts for themselves. 9

According to Ramsay, their arguments are:

(a) Educational theory points to its inclusion, especially at Piaget's concrete stage. Bruner, with his notion of the spiral curriculum, brings this into perspective, especially in the theory of readiness. The basic structured concepts of each subject are translated into the form most appropriate to the child. For example, the mathematical idea of sets, of combinatority and associativity of numbers can be introduced early into the school programme by means of concrete manipulative activity, with much provision for self-directed exploration. Aided by the teacher's guidance and his amplification of those concepts which they have inferred from their exploration, children can be led upward and onward through the spiral to advanced mathematical thinking at a later stage. Presented in this fashion, mathematics never becomes a meaningless manipulation of symbols; rather it becomes a powerful thinking tool. 10

The report goes on to say that the theory of individual differences, combined with modern educational philosophy makes the implication of the readiness argument overwhelmingly in favour of the inclusion of structured materials in the standard classes.

(b) Active manipulative experience with the structured material is essential.

(c) Understanding is the key in a computer age. Computation remains important but to somewhat lesser
degree. Machines will in the future do the work of computation... citizens of the future must understand the basic mathematical concepts to be able to apply them to changing situations. As measurement and structured materials give this understanding of the underlying concepts of number most readily, then they must be included.

The report concludes that:

Based solidly on educational psychology, there is little doubt that a firm case can be put for the inclusion of structured materials in teaching mathematical concepts to 7 to 11 year old children. There is a great need for research in this field in New Zealand. Teacher opinion should be tapped; the new textbooks should be analysed to determine the usage of structured equipment. The theoretical principle appears to be sound; it is this writer's opinion that it merely awaits objective justification.

As a direct outcome of this report, the National Executive of the Institute gave approval to a number of the Curriculum Officer's recommendations, of which one, resulted in the constitution of a special sub-committee of the National Curriculum Committee for Mathematics, Infants to Standard 4 to construct this questionnaire.

At a meeting of the National Curriculum Committee on the 1st July 1967, it was decided to "invite some other teachers to meet with members of this committee to draw up two questionnaires:— the first with regard to the use of structured equipment, and the second with regard to the references to structured equipment in the new texts."

12. Ibid.
13. "That a questionnaire be formulated to gauge teacher opinion on the usage of structured apparatus in standard classes."
14. Minutes of meeting, 1/7/67.
This sub-committee spent a considerable amount of time and effort in the construction of this questionnaire. Advice was obtained from the New Zealand Council for Educational Research, from Ramsay and J. Hand of the Electronic Data Processing Division of the N.Z.B.C., and was finally distributed to schools in April, 1968.

In its final form the questionnaire set out specifically to discover:

(a) the extent to which structured apparatus is used at present;
(b) the extent to which teachers think it should be used;
(c) where existing supplies of the equipment were obtained.

In an attempt to fulfil these aims, the questionnaire contained two sections. The first, of 22 questions was aimed at classroom teachers, the second, which contained 6 questions was designed to be answered by headteachers.

Following specific sampling techniques, 16 branches of the Institute were asked to arrange for a number of teachers in a wide variety of teaching positions to answer the questionnaire.

694 classroom teachers' questionnaires and 136 headteacher questionnaires were circulated, and from these 516 valid responses were obtained from classroom teachers and 112 from headteachers.

An analysis of the classroom teacher responses on the

17. Appendix, 1968/255 p.3.
basis of geographic location, classes taught, length of service and grade of school and of headteachers according to Education Board area and grade of school showed that the random sample was representative of both class and headteachers in New Zealand.

The results of the survey were very fully set out in 'A Report on the Supply of Structured Apparatus' and presented to the National Executive by Ramsay. Contained in the report are some points that are important to this thesis as they lead to conclusions and to the ultimate formation of Institute policy on the supply of structured apparatus to primary schools.

The report states:

The first part of the survey was to discover the extent to which teachers used and favoured the use of structured apparatus in mathematics for standard classes. That teachers strongly favour the use of material is shown by the fact that 99.07% of the intact sample stated that it should become Departmental policy to encourage the effective use of structured apparatus in Standards 1 - 4.

The teachers sampled, put forward a variety of reasons in support of this, mentioning: "it leads to better understanding"; "expels lack of confidence"; "children learn better through 'seeing, feeling'"; "children learn better through experience"; "allows children to bridge concrete and abstract"; "allows for experimentation and discovery". It was obvious that many teachers showed a

knowledge and understanding of Piaget's work. One teacher stated:

Children have yet to develop to the stage of thinking exclusively above the concrete level; 19

another:

Children who have had this approach in the primers need to continue through, if not actually using the equipment for computation it is still essential for the teacher to reinforce ideas using structured apparatus; 20

and:

Many children, especially the slower ones, require much work with concrete apparatus before proceeding to the abstract. 21

The report goes on to say:

...of particular note is the fact that 388 responses which mentioned the need for equipment to effectively implement the new scheme were recorded. Many teachers were quite concerned about this point. To quote one: 'The Department has acted irresponsibly in the introduction of this scheme. I think it is quite ludicrous to introduce a new mathematics scheme, which emphasizes the use of structured apparatus when no equipment is supplied beyond the infant classes.' 22

Just as significant is the fact that only 5 teachers in the survey were of the opinion that the use of structured apparatus should not become departmental policy. The report goes on to say ..."It is notable that 4 of the 5 teachers mentioned above stated that they made some use of the

20. ibid.
21. ibid.
22. op cit. p.5.
equipment in their classroom." 23

The survey showed that some 9.67% of the teachers in the sample did not use structured equipment in their classrooms and while the reasons ranged from: 'teaching a bright class' and 'can make do with self-made apparatus' to, 'haven't found it necessary', 80% of the group (40) did not use the equipment because it was not available. " Only 8 teachers found that it was not necessary in their classroom, and of these only one had decided that it should not be the Department's policy to encourage its use." 24

The survey also sought to determine the types of material in use in schools and the frequency of usage. Cuisenaire rods and number lines were the most frequently used equipment but this usage varied according to the geographical location of the school, the size of the school, the class taught and the teaching experience of the teacher. The report summarizes the results as follows:

(1) City schools make more use of structured apparatus than borough schools and rural schools, except in the case of Cuisenaire rods where the highest rate was in rural schools;
(2) The lower the class, the more frequent the use of the material;
(3) Differences in usage according to years of service were slight. However it is noticeable that the lower groups made more frequent use of the equipment than older groups;
(4) The larger the school, the more frequent was the usage of this equipment. Again, excepting Cuisenaire. 25

25. op. cit. p.7.
Teacher opinion on the use of structured apparatus was also investigated. The consensus of opinion was that all classes should make at least some use of this sort of equipment. Teachers, according to the survey, stood firm in the opinion that a supply is needed for every class... two trends should be noted. First, the higher the class, the stronger the teacher opinion that all classes should use the equipment. Second, the longer the length of service, the stronger the opinion that all classes should use the equipment. 26

In response to a question that asked which ability groups teachers thought benefited most from the use of structured apparatus, several important points emerged:

(1) A large number of teachers refused to give preference to one particular group. This was especially noticeable in the rural sample, who probably have the most experience in multi-class and multi-ability teaching;

(2) The large proportion of teachers who believed the slow groups benefited most. 27

The report reinforced the growing body of opinion that the use of structured material is essential if children are to develop an understanding of abstract mathematical ideas. Where children are given this concrete experience they will develop according to their capacity and so all children can benefit from the frequent use of the equipment.

The questions relating to the supply of structured apparatus evoked thoughtful and sometimes highly emotional responses

27. op.cit. p.9.
from teachers. Only 3.57% of the sample responded that there was plenty of equipment, most responses intimating that the supply was 'minimal'. Rural and borough schools indicated the highest 'minimal' responses, 68.88% and 58.9% respectively, while 45.45% of the urban schools replied that they had sufficient material. The satisfaction indicated here can not be due to the sharing of equipment because, although 87/89% of the teachers were called upon to share equipment with one or more classes, rural schools indicated that they shared more than did urban or borough schools. The report pointed out that teachers were fairly evenly divided on their opinions about sharing, but there were difficulties associated with it that prompted such comments as:

A staggered timetable is necessitated by sharing in this school. This does not suit me, as I prefer to follow a blocked timetable.

The present issue is pathetically inadequate and has prevented proper experimentation with the new mathematics.

A basic issue per classroom is needed. As the new equipment is shared, it is used less than it might be. The incidental learning situation is destroyed by sharing. As the equipment is seldom in the classroom when needed incidentally (it is tightly rostered) much valuable time is lost in getting it (and interrupting another teacher). More often the opportunity is completely lost. My plea is for a basic classroom issue.

One teacher in a large school commented as follows:

29. ibid.
30. ibid.
Already the school committee have spent many hundreds of dollars on rods, number lines, centime etc. But with three classes at each level, S. 2 - 4 and four at standard 1 level and over 400 infants, their expenditure is still well short of the demand. Sharing between classes is time-consuming and awkward as much of the equipment is bulky. 31.

Not only have School Committees and Home and School Associations spent considerable sums of money in providing structured material for their schools but the questionnaire revealed that a large number of teachers have found it necessary to purchase material; in some cases at considerable cost.

Of the intact sample, 32.14% stated that they owned apparatus ... it was found that the higher the class taught, the greater the number of teachers who had purchased or made their own equipment. In S.1, the percentage was 20.45; S.2, 23.33%; S.3, 30%; S.4., 37.5%. The accumulation of years of service was also well illustrated. 51.85% of teachers with 15+ years of service owned equipment compared with 23.33% of those with 1 - 4 years service. 32

The report gave illustrations of a random sample of the types of purchasing teachers have undertaken. These varied from 50 cents to 120 dollars, at an average of 10 dollars 20 cents.

A large proportion of the teachers who completed the questionnaire made additional comments. In the main, these reiterated views already expressed. The most common were strong protests at the 'inadequate' supply of equipment and criticism of the Department's failure to supply the

32. op. cit. p.11.
Some teachers commented that it was 'unprofessional' to make and 'scrounge' equipment; others stated that it was impossible to do the new scheme justice without a minimum issue of basic equipment. The latter is probably best summed up by the following quotation:

When new mathematics was introduced, a minimum amount of equipment should have been provided as was the case in infant classes. Because teachers have been forced to improvise, the use of the new approach to mathematics has been not nearly as effective as it should have been.33

The headteacher's section of the report tended to substantiate the information already given, but it also attempted to discover the amount of equipment in schools at present, who supplied it and how much would be needed to bring the schools up to a minimal supply. 28.12% of the equipment in schools was issued either by the Department or the local Education Board, (not purchased on subsidy), 29.16% had been provided by teachers and 47.72% had been bought by the school committee. In many cases, most of the equipment had been purchased from school committee funds and much had been made by the teachers and committee members at working bees. 92.43% of the schools in the sample shared the infant classes' equipment and headteachers often specifically noted that the Department issued equipment only to infant classes and therefore as teachers wanted to use the equipment in classes other than infant classes they

either had to share, which was inconvenient, or purchase or make equipment, which was expensive. This only served to emphasize the inadequacy of the present supply and many headteachers took the opportunity to comment on this.

The several pilot schools which were included in the survey had limited access to the District Senior Inspector's Special Purposes Fund, in so far as money was often supplied from this fund for the purchase of equipment. To this extent they were better off than other schools of similar grade, but this fact tends to make the statistics appear to be better than they are.

The results of the survey, justified for the Institute, eight major conclusions which were summarized as follows:

1. Teachers feel that there is a genuine need for this material at the Standard 1 - 4 level. Comment: Teachers justified this opinion on the grounds of personal experience, educational psychology and number research.

2. Teachers make considerable use of the material and feel that it should be issued on an adequate basis. Comment: Many schools still have no equipment supplied specifically for use in the Standard classes; many teachers felt that they were not implementing the new scheme as well as they might because of the lack of equipment.

3. Teachers would be willing to share certain equipment, but feel that some equipment should remain in the classroom. Comment: The incidental learning situation and the blocked timetable are factors here. There is little doubt that a basic issue should be made to each classroom (abaci, number lines, cuisenaire, centimo, 100's boards) with other equipment being available on a share basis (Dienes blocks).

4. There is a close relationship between the availability and the usage of material.
Comment: The survey conclusively revealed that teachers will use the equipment if it is available. Frustrations at non-availability were apparent and schools which were well supplied indicated that teachers were making frequent use of the material. A frequency/availability correlation of 0.92 was discovered. This was ascertained by relating responses on supply of equipment to usage made of the equipment.

(5) Although many schools have a considerable amount of equipment, the supply is still not adequate.

Comment: A considerable amount of money has already been expended in this field, but headteachers' opinions indicate that more equipment is needed to bring their schools up to a minimal supply. Two exercises will be needed. In the first place the word 'adequate' must be carefully defined. Second, Education Boards will need to ascertain what material is in schools.

(6) Most of the equipment has been supplied (on subsidy) from school committee funds.

(7) Many teachers have been put to considerable personal expenditure by the Government's failure to supply adequate equipment.

(8) The situation is an urgent one.

Comment: Many teachers emphasized the urgency of the situation. There can be no doubt that if the scheme is to be fully operative next year, the equipment must be supplied prior to February 1, 1969. 34

Once again the question arises: 'What is an adequate supply of structured material?' It was on the meaning of this word 'adequate' that the Department's case for shelving the provision of structured apparatus rested. 35

The Institute, however, has no intentions of letting the matter drop. Their next aim was to present a fully documented case to the Department. In their reply to the

35. v. supra p. 61. (Appendix, 1967/22.)
questionnaire on structured apparatus, two headteachers enclosed what they thought should be basic lists for their respective schools. These lists tended to reinforce and confirm the basic list that the National Curriculum Committee for Mathematics, Infants to Standard 4 was in the process of formulating. In actual fact this committee, influenced by one of the major findings of the Institute's survey of overseas research, "that much of the most valuable material was of the teacher's personal choice and/or construction..." set out to build up two lists. The first, which it considered to be basic and essential was primarily a list of structured materials and apparatus for use in number, measurement and geometry, while the second consisted of those materials which could be useful for the manufacture of semi-permanent apparatus which the teacher, or children under supervision, could make. In both lists the committee was considerably influenced by the materials suggested in the 'Modern School Mathematics' series. The two lists were considered by the Standing Committee of the Institute in August, 1968 and it was recommended that they be accepted by the Executive.

As has been indicated, the Institute feel that the question of the supply of structured apparatus and materials to schools is an urgent one. As a result they proposed that

the Department take several immediate steps:

(1) Agree with the Institute on:
   (a) a basic list of apparatus, and
   (b) a supplementary grant to schools (to purchase the
       additional equipment or raw materials of the
       second list);

(2) Assess the amount of equipment already in schools;

(3) Supply the equipment necessary to bring the schools
    minimum requirements within the next six months;

(4) Immediately begin the preparation of a handbook
    outlining the use of this equipment (the Institute
    offers its help in preparing this handbook). 37

The Institute's case for the supply of structured
apparatus to standard classes was presented to the
Department in a formal report 38 which concluded:

The Institute is certain that any delay in taking these
steps will result in the lessening of the efficiency of
the revision, with subsequent detrimental effects on
the pupils. We therefore urge the Department to give
immediate consideration to the points raised in this
report. 39

This report was to be discussed in November, 1968. The
outcome will be most interesting, as the new syllabus is
due to become official for Infants to Standard 4 in
February, 1969. There seems little hope at this point for
the supply of adequate equipment before that date.

38. The Supply of Structured Mathematics Apparatus to
    Curriculum Officer to National Executive, October, 1968.
39. ibid.
Chapter 6.

The Pilot Schools.

In New Zealand the revision of the primary school curriculum is a continuous process. Prior to the present revision of the mathematics syllabus, the syllabuses in English and Social Studies were revised and a pattern for revision established. While the Department of Education does not consider the pattern to be rigid, the pattern of revision, which was stated in a UNESCO publication in 1958 is as follows:

1. A committee is set up. If possible the chairman is a member of the committee that worked on the current syllabus. Members of the committee are drawn from the university, secondary schools, private schools, teachers' training colleges, the inspectorate, headteachers of primary schools, assistant teachers of primary schools and representatives of the teachers' organizations. The committee has power to co-opt anyone who may make a useful contribution.

2. The committee prepares a draft syllabus, which is studied in the Department of Education.

3. A handbook of suggestions for teachers is prepared.

4. District senior inspectors are asked if they would like to have the syllabus tried in their district.

5. The senior inspectors accept the proposal and appoint a staff inspector to take charge of the work.

6. The staff inspector discusses the nature of the work with the curriculum officer and invites a number of teachers to undertake the trial.

7. The trial proceeds for a period of three years, during
which the curriculum officer visits the schools to discuss the new syllabus and to gather information about the methods of work. He also meets groups of headteachers and others to explain to them what is being done.

8. Each year the teachers send reports to the curriculum officer, who, with the help of the committee, prepares a bulletin which is partly a report back to teachers, partly a collection of answers to teachers' questions and partly a statement of problems that concern the committee and about which more information is wanted.

It is proposed after the third year of trial, to review the results: Has the trial been successful? Has the success been sufficient to justify a revision of the official syllabus? Should the whole question be opened again from some point of view?

If the trial is deemed successful, the committee will revise the trial syllabus in the light of its experience and will submit it to the Director of Education. After study in the Department of Education, the new version will be published for all teachers to read and criticize. After this, a final version will be prepared and submitted to the Minister of Education for his approval. Only when that approval has been given will the syllabus be printed and distributed for use in schools. 1

There is no question that trial by teachers in the classroom was thought to play a significant role in the revision of new syllabuses and in 1964 some 70 classes were working on exploratory syllabuses in the new mathematics for Standard 1. 2

The writer had been involved with teaching the draft infant syllabus at a pilot school in 1963 and 1964 at the primer 4 - standard 1 level and had accepted the invitation to the Lopdell House in-service course for Standard 2

1. UNESCO, Educational Studies and Documents, No. 28
2. v. supra. p.20 (Minutes, CLC meeting, 27/11/64, p.4.)
classes in 1965. Although receiving quantities of notes and bulletins from the Curriculum Development Unit, he was not asked, at any time to report on progress or make suggestions. That this was not an isolated case is evident from the December 1965 report of the National Curriculum Committee for Mathematics, Infants to Standard 4, which recommended to the Institute that there was need for co-ordination, guidance and supervision from the Curriculum Development Unit to ensure that all teachers and headteachers concerned with the trial syllabus receive complete sets of notes and are provided with sufficient guidance so that the work in the pilot schools could and would be fairly evaluated within the normal conditions of classroom work. This would ensure that alterations to the draft syllabus could be justified on a practical basis.

The fears about the nature of the 'trial' of the new syllabus were confirmed in a report from the National Curriculum Committee's representative at the February, 1967 course at Lopdell House for Standard 4 pilot classes. The report states:

We have been aware that the syllabus beyond the handbook of 'Suggestions for Teaching Mathematics in Infant Classes' has been largely constructed by a few departmental officers and has not grown out of long term extensive research within this country to the same extent as the handbook grew out of the work of the 1953 Standing Committee in Christchurch. Although much of this research transfers to higher levels we have always felt that the development in the middle

classes was the work of a few and that this group was a little 'thin' in some areas. For instance, a greater representation of practising teachers and outstanding university mathematicians might have helped with many of the problems that have occurred. Inspite of this we were prepared to accept what has been done in the draft syllabus as it appears quite valid. However, we did this in the basis of our understanding that the draft syllabus was the result of extensive trial and comment by teachers in our pilot schools. Our questions re the extent of evaluation and contact with pilot schools have been fairly well evaded and we have been a little suspicious at times. Accumulating evidence and the report of our representative indicate more and more that there seems to have been very little 'trial' in the full sense of constant contact, guidance and evaluation with and by pilot teachers.

It is beginning to look as if many of the pilot schools undertook this work and did it in their own particular way and that little guidance and contact was developed by the Department. In fact many of these pilot teachers that we are aware of have not been asked to comment on the practicality of the syllabus not are they aware of any worthwhile evaluation that has been made. In fact, the draft syllabus, which lines up very well with the new texts and which in fact may be excellent when implemented, has essentially been the work of a very few departmental officers. 4

In view of this evidence the National Curriculum Committee asked the Institute to carry out further checks through its curriculum officer in order to see how the pilot scheme had been operated and to what extent evaluation had been attempted.

The Curriculum Officer's report which was presented to the Executive in October, 1967 attempted to establish the exact function of pilot schools in syllabus revision and consider whether they had fulfilled this function.

The report began by highlighting the apparent points of disagreement between the Institute's syllabus and curriculum policy and the Department's approach.

The Institute has, for some years, enunciated the steps which should be followed when a syllabus is being revised. This may be summarized as follows:

1. Early pilot testing by a limited number of schools.
2. The drawing up of a draft revision based on the pilot schools' experiences.
3. More controlled testing of the draft revision by a representative cross-section of teachers.
4. Evaluation at all stages and decision on adoption of the revision.
5. A period of general experience with the revision followed by a re-evaluation.

The principle that is firmly based in the above outline is that of controlled, objective testing of new schemes under classroom conditions. But while the procedure of revision of syllabuses by the Department is basically in agreement with Institute policy, the Department have made the following statement.

Usually, revision is carried out by a very large number of teachers, so that there is likely to be considerable familiarity with the proposed changes, satisfaction with them and active demand for them before they are officially adopted. During the time of trial for a draft syllabus, most teachers' colleges allow their students to read and discuss it so that they may know the direction of thought in this part of the curriculum.

At the same time, many other teachers read and often copy, the syllabus and the handbook and the principles

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5. Summary of Institute policy, 1967, p.32 et seq.
and practices suggested in the syllabus are thus taken into many schools. At teachers' refresher courses, speakers on a subject undergoing investigation often use the trial syllabus as a source of material. In all these ways, the influence of the trial syllabus spreads far beyond the schools that are officially trying it, and the result has been a noticeable improvement in the teaching of 'trial' subjects in schools in general. 

There exists some measure of contradiction in these two parts of the statement. The first uses the term 'trial' to mean a trying out, with adequate evaluation and in the second, 'trial' means an opportunity for the infiltration of a new syllabus or a growing implementation. This has often been referred to as the 'bandwagon' effect, condemned by the Institute and the Department as having a tendency to pressurize teachers into operating a programme with which they are unfamiliar thus jeopardizing a satisfactory implementation of the syllabus.

The 'Education Gazette' notice of February, 1965 had foreshadowed this type of implementation when it stated:

In succeeding years this pilot work will be extended to Standards 2, 3 and 4 and at the same time will be gradually passed on to other teachers. 

The enquiry conducted by The Institute's Curriculum Officer, P.D.K. Ramsay, sought information in several areas, namely, types of evaluation carried out, methods of reporting and the success of the scheme. A questionnaire

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structured to elicit this information was memorized and on his regular visits to branches throughout the country Ramsay interviewed 134 teachers in 25 of the official pilot schools at staff meetings, branch meetings and at informal gatherings. The responses to the questions were tabulated after the interview. In his report he pointed out the weaknesses of the study he had undertaken.

1. Responses were dependent upon memory over three years. Only in three instances were written diaries mentioned and referred to.

2. The sampling was largely in city areas. Rural areas may have experienced different circumstances.

3. The Department's policy, on which conclusions are drawn is now nine years old and appears in an overseas publication.

The results of the survey are set out as follows:

1. It was discovered that almost one third of the teachers interviewed had been at the school for less than one year. (These 48 teachers were not included in the final survey) Just over 30% had been at the schools for the full period of piloting.

2. Evaluation:

*(i) 15% reported direct in writing to the Assistant Curriculum Officer.
*(ii) 12% reported verbally to the Assistant Curriculum Officer.
*(iii) 30% reported informally through the local inspectorate.
(iv) 5% reported in written form to the local inspectorate.
(v) 41% made no report at all.

* These figures are distorted by the Hamilton group who, through their own initiative, reported both to the inspectorate and to the C.D.U. Excluding this group of schools, the 'no' report rises to over 60% of the sample.
(vi) 4% made both written and verbal reports to the local inspectorate. 
(vii) There was no official checklist. 
(viii) 92% agreed that modifications to the first drafts had been slight. 
(ix) The Assistant Curriculum Officers had visited 19% of the schools in the sample. 
(x) 69% of the teachers involved agreed that feedback had been spasmodic. The notable exception was 'Hamilton', where special conditions applied. One headteacher of a pilot school in Hamilton, dissatisfied with notes and reporting to the Curriculum Development unit, called a joint staff meeting of Hamilton pilot schools. At this meeting, it was discovered that 'gaps' in notes existed and that very little in the way of true experimentation was taking place. A 'strong' letter was forwarded to the Assistant Curriculum Officer in Mathematics and following some delay, full sets of notes were provided. The Hamilton schools received much better treatment following this. It must be noted though, that they still did not feel that they were being asked to experiment; the general impression was one of implementation.

3. Success of Piloting:
   (i) Two schools had abandoned piloting completely.
   (ii) Most schools were at the Standard 3 level this year. (84%)
   (iii) 91% of the teachers claimed that gaps in issued notes had occurred. Again the Hamilton experience is notable in this respect.
   (iv) In general the overwhelming majority favoured the new mathematics scheme for a variety of reasons, which included: pupil enthusiasm; greater understanding and improved attitudes; improved achievement was also frequently mentioned.

4. Contacts with other Schools:
   (i) In no instances did the pilot schools take the initiative and ask other teachers to observe their work.
(ii) Two headteachers admitted that the local inspectorate had advised such a move. One had followed the advice.

(iii) Teachers had found other teacher curious (and insecure) and in many instances had given help and advice.

(iv) Several teacher felt that the infiltration approach was the set policy and that pilot schools were indeed resource schools. Ten of the headteachers agreed with this, the others were non-committal.

5. **Problems:**

(i) **Headteachers.**

a. An overall lack of guidance from the central authorities.

b. Excessive staff mobility - this was the cause of the drop-out of one school.

c. Lack of expression of aims of pilot schools and their relationship with other schools.

d. Change of controlling personnel, especially in the local inspectorate. Some felt that the departure of R. McFarland also played a vital role.

(ii) **Teachers.**

a. Most of the above, plus

b. A lack of equipment. They agreed fully with the Institute suggestion of a variety of experimental equipment being provided.

c. Incomplete sets of notes.

d. Lack of enunciation in the guide notes themselves.

e. Which scheme to follow if arrived at or departed from a pilot school.

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The report continues:

It must be commented at the outset that the hypothesis of trial-implementation dilemma indicated by the UNESCO report appears to have been carried into practice in the mathematics piloting scheme. Certainly there has been a notable lack of objective trials carefully evaluated and modified according to results. Notably, modifications have occurred in the schools, but these schools have never presented a formal report. The degree of informal evaluation during inspections and so forth is difficult to assess. Many headteachers claim that no mention was made of piloting mathematics by inspectors during their visits. This varied from board to board. Furthermore, there appears to be no central report upon which overall revisions have been made. A Lopdell House course seems essential prior to official adoption at this stage. It is the considered view of this writer that in the instance of the new mathematics, an 'a priori' judgement (perhaps based on overseas experience) was made and that pilot schools were developed as resource rather than research institutions. 10

Ramsay went on to say that the most fortunate aspect of the survey was the fact that teachers in pilot schools almost unanimously favoured the new mathematics. They were however, concerned with the lack of equipment supplied to pilot schools and it was hoped that the Department would take steps to supply adequate supplies of this prior to the syllabus becoming official. 11

As a result of the survey, 12 Ramsay concluded that:

...implementation and trial of the new mathematics syllabus have been confused...any future syllabus revision must, in the initial stages, be firmly controlled and evaluated. Only when tested and proved should wider experimentation be encouraged... the Department and


11. ibid.

12. The National Executive never took this survey much further than just reading it.
the teachers' organizations must combine to ensure healthy experimentation and widespread acceptance of new ideas through carefully planned sequential steps. All teachers should be kept fully informed of progress at every stage. 13

The National Curriculum Committee for Mathematics, Infants to Standard 4, recommended in its first report to the National Executive of the Institute that "full-time advisory arithmetic be appointed in each Education Board district (possibly more than one) to work in such the same way as Reading advisers." The committee felt that these appointments should be permanent or for such a period that would allow for full guidance throughout the time it takes to have the trial syllabus fully implemented in all primary classes. The committee also saw the need for advisers beyond the trial stage. It believed that they would be invaluable to plan appropriate in-service courses for teachers in the various areas that would overcome and meet the different and progressive needs of these teachers.

Another recommendation, from the 1966 January refresher course held at Lincoln College on 'Teaching Arithmetic in Standard 1'-it was noticed to illustrate the concept of a need for advisory teachers, presented an outline on March 23.

Chapter 7.

The Appointment of Mathematics Advisers.

The National Curriculum Committee for Mathematics, Infants to Standard 4, recommended in its first report to the National Executive of the Institute that "full-time advisers in arithmetic be appointed in each Education Board district (possibly more than one) to work in much the same way as Reading advisers." The committee felt that these appointments should be permanent or for such a period that would allow for full guidance throughout the time it takes to have the trial syllabus fully implemented in all primary classes. The committee also saw the need for advisers beyond the trial stage. It believed that they would be invaluable to plan appropriate in-service courses for teachers in the various area that would overcome and meet the different and progressive needs of these teachers.

Another recommendation, from the 1966, January refresher course held at Lincoln College on 'Teaching Arithmetic in Standards 1 - 4' tended to reinforce the concept of a need for advisers. However, in an interview on March 23, 1966, the Director of Primary Education said that the

2. v.supra. p.33.
Department was not yet ready to discuss an advisory service in mathematics. At a subsequent meeting with the Department in April, 1966, the Institute, concerned with incipient feelings of insecurity among teachers with the curriculum change proposed two measures to reduce this insecurity:

1. proper in-service training and
2. adequate equipment, including textbooks.

The Institute felt that advisers were needed in mathematics more than in any other area at this time, as many teachers in the Standard 2 - 4 area were out of touch with the principles which had been developed in the infant school.

In reply, the Director of Primary Education said that there was a difficulty in finding enough teachers to do this work in mathematics and he preferred a programme of in-service training for teachers of Standard 2 upwards.

The question of advisers in mathematics was again raised in a remit to the annual meeting of the Institute in May through a remit from the Auckland branch of the Institute which stated:

That a specialist service with advisers in mathematics be established.

3. Appendix, 1966/64.
5. op. cit p.3.
6. ibid.
7. Remit to annual meeting of the Institute, 1966/100.
In discussing this remit in June, the Director of Primary Education said that a knowledge of the new mathematics was already available in most districts but there may be other ways of making this knowledge available than through the appointment of mathematics advisers. 8

In October, 1966, the National Curriculum Committee urged renewed efforts on the part of the Institute to have full-time advisers appointed in each board area. It said that the need for this assistance with the introduction of the new series of textbooks and the new syllabus was essential if teachers were to gain full advantage from the textbooks. 9

In July, 1967, a temporary advisory service in mathematics was established in each board area under the control of the District Senior Inspector. Two teachers were seconded in each area with the exception of Nelson and Taranaki boards where only one was appointed. These advisers were given an intensive course at Ardmore Teachers' College in the content and teaching of the new textbooks and have since intensified local district programmes of in-service training. An 'Education Gazette' notice of 16, September, 1968 shows the Department's intention to continue this service to teachers. The positions advertised however, were

9. Appendix, 1966/224, p.3
long-term temporary positions for a period of two years beginning February 1, 1969. While this will satisfy an immediate need in the teaching service the Institute feels that it is necessary to build up the advisory services on a semi-permanent basis and it expressed this point of view in an interview with the Director of Primary Education on August 29, 1968.

At the same time, developments in mathematics have been taking place in primary and intermediate schools. The modern mathematics syllabus will come into use for Standards 1 - 4 during 1967 and 1968, and the new textbooks on modern times will be provided.

This was the first official notice to teachers, apart from the 'Education Gazette' notice in 1965, of the Department's intention to carry on with the implementation of the mathematics revision. At this stage, the pilot scheme was about to be introduced at the Standard 4 level through a Lordell House course in March.

At the meeting of the Curriculum Liaison Committee in November, 1966, the Department had stated that the textbooks had been tried from the publisher and that they should be in New Zealand in March or April 1967. It was available for study while teachers were working through the Decimal Currency Handbook, and would be used later in the year.

10. Appendix, 1968/256, p.3.
Chapter 3

The Distribution of Textbooks and the Timetable for
the Introduction of the New Scheme.

The first indication of when the new mathematics syllabus
and textbooks were to be introduced came in an 'Education
Gazette' notice of January 16, 1967. The following
quotation from the middle of the notice is important.

At the same time, developments in mathematics have been
taking place in primary and intermediate schools. The
modern mathematics syllabus will come into use for
Standards 1 - 4 during 1967 and 1968, and the new
textbooks on modern lines will be provided. 1

This was the first official notice to teachers, apart
from the 'Education Gazette' notice in 1965, 2 of the
Department's intention to carry on with the implementation
of the mathematics revision. At this stage, the pilot
scheme was about to be introduced at the Standard 4 level
through a Lopdell House course in March.

At the meeting of the Curriculum Liaison Committee in
November, 1966, the Department had stated that the text-
books had been ordered from the publisher and that they
should be in New Zealand in March or April, 1967. It was
thought that they would be available for study while
teachers were working through the Decimal Currency
Handbooks, and would be used later in the year. 3

Books 1 and 2 were not distributed to schools until the second term of 1967 following an 'Education Gazette' notice which outlined the scale of distribution of teachers' manuals and pupils' books as follows:

State Primary Schools.
District High Schools.
Department Schools.

Teachers: 1 copy of the book 1 teachers' manual and pupils' text to every Standard 1 teacher.
1 copy of the book 2 teachers' manual and pupils' text to every Standard 2 teacher.

Pupils: 1 copy of book 1 to every Standard 1 pupil.
1 copy of book 2 to every Standard 2 pupil.

Schools requiring additional copies of either teachers' or pupils' books for special classes must apply through the headteacher to the district senior inspector. Requests for pupils' books for increased rolls or new classes should be addressed to the Education Board in the usual way.
Special schools will be issued with one copy of each manual and pupils' text, and requests for any additional copies required should be addressed to the district senior inspector.

Catholic Primary Schools and other Private Primary schools were to be issued:

Teachers: 1 copy of the book 1 teachers' manual and pupils' text to every school with Standard 1 classes. (Likewise for Standard 2)

Pupils: 1 copy of book 1 for every Standard 1 pupil and 1 copy of book 2 for every Standard 2 pupil.

One section of the notice asked headteachers to ensure that all possible care is taken with the new textbooks, as no replacement copies for books damaged through wear and tear will be available for at least four years.

Schools were required to supply the exact number of

of children in Standards 1 and 2. In many cases, changes in the school roll in the time between request and delivery resulted in surplus books in some areas and shortages of books in others.

A January, 1967, refresher course held at Lincoln College for headteachers of Grade IV schools had made the following recommendation: 'That additional complete sets of the teachers' edition of the new mathematics textbooks be made available to schools on a liberal basis.' This drew the following comment from the Department: 'The new mathematics textbooks will be issued in sufficient numbers for all schools to have adequate supplies. The acquisition of books of this quality is an important step and the general issue will ensure that there are sufficient copies for all teachers and pupils at the appropriate levels. At the same time, of course, care will be taken to avoid any issue of books in excess of normal requirements.'

At this stage in the implementation of the new mathematics scheme there were three factors which were deeply concerning teachers: the distribution of the textbooks; the timetable for the introduction and the question of 'teacher readiness'.

Resolutions from local branches of the Institute regarding inadequate supplies of the new textbooks were received by the National Executive from Southland, Pahiatua-

6. ibid.
Bush and South Canterbury. Other branches complained that the issue was not flexible enough to cater for individual differences, for example, Standard 2 pupils working at Standard 1 level. At a meeting with the Director of Primary Education on August 30, 1967, the Institute representatives referred to the distribution of the teachers' manuals and the need for teachers of composite classes and the headteachers of primary and intermediate schools to have their own copies for all classes. The Director said that 5,500 books had been ordered for about 3,000 classes and while there was some duplication in small schools where teachers took a range of classes, and that generally composite class teachers would have both handbooks, there were no spare copies available for issue to headteachers. He went on to point out that additional copies could be purchased under subsidy.

The dissatisfaction of teachers with the distribution of pupils' textbooks led to a survey by the Institute's Curriculum Officer. The results of this survey were presented to National Executive members in January, 1968. Four returns from seven branches surveyed supplied the following information:

In 150 schools, 21 had a complete issue while 44 were

7. N.Z.E.I. Correspondence file 44/5
short by 277 copies of book 1, 38 schools were short by 247 copies of book 2 and there was a surplus in the other schools of 46 book 1 and 61 book 2.

In an interview in January, 1968, the Director of Primary Education said that every child was entitled to a book and there was, in New Zealand, a book for every child who needed it. He went on to say that increases in rolls had been allowed for. 84,000 books had been bought for 60,000 pupils. Several thousand book 1 and 2 were still held by the Department and any teacher who had a pupil without a book should write to the Department if he could not get satisfaction from his Education Board.

On the question of teachers' manual, the Institute continued to press for a more liberal distribution, as, in the above survey, of the 150 schools, 45 were short of book 1 and 44 of book 2. The Institute renewed its request for the supply of a teachers' manual for every teacher according to the class or classes he teaches in a letter to the Director of Primary Education in May 1968. It also recommended that a reference set for schools of Grade IV and above be supplied by the Department. The Institute felt that if the 'spiral' approach is to be correctly interpreted and applied by teachers, they must have ready access to all the books in the series. Many teachers had

10. Interview with B.M. Pinder, Director of Primary Education 25/1/68. Appendix, 1968/32.
11. N.Z.E.I. Correspondence file; letter dated 17/5/68.
expressed their dismay at the frequency with which they had to borrow other teachers' manuals and as this was an exploratory year and teachers were using their manuals continuously for preparation purposes this created additional problems. The teachers were often precluded from studying the other books in the series in depth and it prevented them from appreciating the complete development of the concepts. 12

In reply, the Director said that the long term answer was to improve the textbook grant to allow for the purchase of all books for pupils as well as teachers' manuals, and that he wished to expand on this point in his answer to the Annual Meeting remit on the matter. 13

This remit stated:

That this Institute acquaint the Minister and the Department of its professional concern with the manner in which the mathematics has been introduced into primary schools and declare its unwillingness to ask its members to implement such new developments unless a scheme satisfactory to the Institute has first been agreed upon with respect to such matters as curriculum content, timetabling, finance and supply and teachers and student training. 14

Following the 'Education Gazette' notice of January, 16, 1967 re the timetable for the introduction of the new mathematics scheme, the next major statement came from the Institute in an article in 'National Education', March, 1967. 15

12. N.Z.E.I. Correspondence file; letter dated 17/5/68.
15. How the New Maths Scheme will be Introduced, National Education, March 1, 1967, p.58.
This article was not only an attempt to draw teachers' attention to the 'Gazette' notice that preceded it, but was also an attempt to be more specific about the time of implementation. "It is proposed to introduce the new mathematics in Standard 1 and 2 in the second term of 1967, and in Standards 3 and 4 in 1968." It also sought to remind teachers of their professional responsibility to be ready for the new scheme.

...although in-service training courses will be provided, the individual teacher, as always, will be expected to make himself thoroughly conversant with the new concepts. The Curriculum Development Unit has made the reassuring statement that 'teacher readiness' is of prime importance for the successful introduction of the scheme. In line with this, the Department has adopted the policy of having the teachers' text in the schools at least a term before the scheme's introduction, and proposes also to take the responsibility for adequate in-service training. The individual teacher will need to supplement this programme with personal study. 16

Teachers were also reminded that all schools except those involved in the pilot scheme would need to continue with the traditional syllabus and that any experimentation with the new mathematics would need to be supplementary to the normal programme and only attempted when the teacher was fully familiar with the new concepts.

At the Curriculum Liaison Committee meeting in November, 1967, the Department estimated that by April, 1968, the Standards 3 and 4 pupils would be actively involved in the new scheme. 17 A further 'Gazette' notice in December,

16. How the New Maths Scheme will be Introduced, National Education, March 1, 1967, p. 58.
advised teachers that the pupils' editions of books 3 and 4 would be issued to schools during the first term of 1968. It was also stated that teachers would be issued with a copy of the new mathematics syllabus for infants to standard 4 during 1968. This notice went on to say:

"Teachers should begin work from the new books as they become available. The year, 1968, however will be regarded as an introductory year which will give teachers further opportunity to familiarize themselves with the new books and the syllabus. The new syllabus will not be an official requirement until 1969."

To date there has been no further notification of an official timetable for the introduction of the new mathematics scheme.

Chapter 9.

The In-service Training of Teachers.

The question of teacher readiness for the new mathematics scheme has been one that has concerned the Institute for some considerable time.

Since the inception of the Teachers' Refresher Course Committee in 1944, there has been a high degree of co-operation between the Department and the teachers' organizations which has resulted in significant developments in the sphere of in-service training for teachers. The Teachers' Refresher Course Committee is composed of representatives from the three teachers' organizations, N.Z.E.I. (3), P.P.T.A.¹(3), A.T.T.I.²(1) and the teachers' training colleges (1). The Government provides the essential finance and some administrative assistance, but the responsibility for the planning and running of the courses rests with the committee. The committee's plans are subject to the approval of the Director-General of Education, but such approval is never withheld unless there appears to be strong reason for doing so. Attendance at the courses, which are held in the summer holidays has always been voluntary, the Department paying the teachers'

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1. Post-Primary Teachers' Association.

2. Associated Teachers in Technical Institutes.
travelling expenses and the teachers meeting the cost of hostel accommodation. Topics for courses emerge from the grass-roots of the teachers' organizations, i.e. recommendations from branches, and from these about 16 courses are held each year. For 1969 there will be 8 primary, 6 secondary and 2 combined primary and secondary courses. Attendance of teachers is usually good, with most courses being filled. Some 10,180 teachers have attended courses in the years 1964–1968. The continued success of these courses has probably been due to two factors, namely, that the responsibility for the planning and conducting of the courses rests largely with the teachers themselves and that the courses have usually been residential.

The Department of Education maintains two in-service training centres. Wallis House, in Lower Hutt and Lopdell House, in Titirangi, Auckland.

The Wallis House courses organized by the Department have been primarily for departmental officers, but there have been courses for headteachers and at nearly all the courses, one or two non-departmental people have been present, e.g. teachers' college personnel or Institute representatives. These courses are not basically in-service courses but rather opportunities for discussion of

administrative problems, problems in the implementation of areas of the curriculum and in the clarification of the aims of education.

In 1961, the Department of Education established the residential centre for in-service training at Lopdell House in Auckland to provide courses at a national level. This substantially increased the number of courses of the type that were held at Wallis House and has therefore been a notable development. In 1968, some 54 courses, both national and regional were held at Lopdell House, most of them lasting for a week. The 38 national courses were attended by teachers from all over the country.

Hardly anybody who has had any influential part in New Zealand education has not been to Lopdell House. Since its establishment some 6,000 teachers and administrators have attended more than 290 courses. The work that has been done here in the past six years has made a very significant contribution to the skill and competence of teachers throughout the country. 4

There has been some dissatisfaction expressed by teachers with the method of selection of teachers for these courses. The particular area of dissatisfaction appears to be with the procedure for selection; a topic which the Institute is discussing at the moment with the Director of Primary Education.

Another scheme for in-service training has been operating at the regional level since 1960. Courses have

been conducted at Walters House, Kingsland, under the direction of the district senior inspector of primary schools, Auckland. These courses which are normally of six weeks' duration are for practising teachers in the Auckland district and their purpose is to provide intensive training in the content and teaching methods of particular subjects of the primary school curriculum.

To the foregoing facilities for in-service training which are primarily by invitation, there must be added the contribution that is made available by specialist advisers in subject areas, inspectors and field officers of the Department.

Circular memorandum B.53/15 of the 16th April, 1953 gave authority to the district senior inspectors of primary schools to arrange and conduct local in-service training courses in any area of the primary school curriculum in which the district senior inspector felt there was a need for courses. Further provision was made under the 'Classes for Teachers Regulations, 1967', whereby an Education Authority may, on the recommendation of a senior inspector and with the approval of the Director-General, provide classes for the instruction of teachers in the teaching of any subject or subjects of primary, secondary or technical education or in the teaching of children requiring special education, providing that the number
of teachers is sufficient to warrant the employment of a part-time lecturer.\footnote{5} Such courses have often made use of specialist advisers as resource personnel for school-time, late afternoon or evening courses in particular districts.

Since 1952, the Department of Education has also employed its own Officer for In-service Training, who participates in the national courses held at Wallis House and Loppell House, and who conducts other courses in areas throughout the country.

Courses have been provided through the appointment of organizing teachers in certain country districts. The major responsibility of these organizing teachers is to give professional assistance and guidance to teachers in two-teacher and sole-charge schools.

Although the Department of Education has played a major role in the field of in-service training, the Institute, through its many branches, has also been instrumental in providing in-service courses for its members.

In 1965, a questionnaire to all branches on the extent of the in-service courses held in their area elicited the following information from 53 branches:

37 branches organized their own courses in out-of-school time;
The Department arranged courses for 48 branches during school time and for 42 branches in out-of-school time.\footnote{6}

\footnote{5} Classes for Teachers Regulations, 1967.
\footnote{6} Report to National Executive from N.Z.E.I. Salaries and Research Officer.
At this stage there was no reimbursement of any travelling expenses incurred by teachers in attending either the in-school-time or out-of-school-time courses. However, since May, 1968 the Department have been prevailed upon to pay travelling expenses for teachers attending departmental courses where the distance travelled is 10 miles or greater.

In September, 1968, the writer circularized all district senior inspectors and all branches of the Institute with a questionnaire designed to show the number of courses that have been held in the new mathematics syllabus, the area of the school which was involved in each course, whether the course was held during school time or in out-of-school hours, who was responsible for the organization and planning of the course and who the lecturers were.

There were 30 returns from branches of which 6 were unable to supply any information for a variety of reasons, the chief one put forward being that no records have been kept. Returns from district senior inspectors were disappointing. There were five answers, two of which supplied information, Wellington for 1967 and 1968 and Taranaki for 1964 to 1968.

The results are summarized as follows.
Table I: In-Service Training Courses in Mathematics, 1964 to 1968.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Courses</th>
<th>Teacher Release</th>
<th>Out-of-school Time</th>
<th>Area of Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>13</td>
<td>4</td>
<td>9</td>
<td>D.S.I.</td>
</tr>
<tr>
<td>1965</td>
<td>23</td>
<td>15</td>
<td>8</td>
<td>N.Z.E.I.</td>
</tr>
<tr>
<td>1966</td>
<td>51</td>
<td>37</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>1967</td>
<td>118</td>
<td>74</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>1968</td>
<td>127</td>
<td>100</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

Explanations:

No information was available for the years prior to 1963. The information presented for the years 1964 to 1966 was obtained from sketchy records, memory, and diaries. In the Wanganui Board area, the information came from the Mathematics adviser, Adviser to rural schools, and the Adviser to infant classes. This information was very detailed but there was no duplication of information as the contiguous

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7. The questionnaire was passed on to these advisers by the secretary of the Wanganui branch of the Institute.
branches did not reply. In the Taranaki Board area, a wealth of information was supplied by the Junior Class Adviser and here again there was no duplication of information.

Where courses had been spread over a period of weeks, for example 3 hours per week for 6 weeks, this was credited as one course.

From the above table the following points are significant:

1. There has been a significant increase in the number of courses held over the past five years.

2. The proportion of teacher-release to out-of-school time courses has improved.

3. Bearing in mind the official dates for the introduction of the teachers' manuals, 'Suggestions for Teaching Mathematics in Infant Classes' through 'Modern School Mathematics', book 4, there has been a similar direction of courses. For example, the manual for Infant classes became official in 1965. Courses held in 1964 through 1966 were mainly directed at this level. In 1967, the introduction of 'Modern School Mathematics', books 1 and 2 resulted in a change of emphasis in in-service training to Standards
4. Over the past five years, district senior inspectors have made themselves responsible for the organisation and planning of more in-service courses in mathematics in their areas. The appointment of mathematics advisers has resulted in a significant increase in the number of courses.

Courses organized by the Teachers' Refresher Course Committee have followed the same sort of pattern:

January 1965: Arithmetic in the Infant School:
2 North Island courses, 
1 South Island course.
Arithmetic in the Junior school in Sole and Two-teacher schools
Teaching Arithmetic, Standards 1 - 4.

January 1966: Teaching Arithmetic, Standards 1 - 4 
2 courses.

January 1967: No refresher courses specifically for Infants to Standard 4 mathematics.

2 courses.

January 1969: Mathematics for the Junior school. 
2 courses.

Apart from the courses listed above there have been numerous courses run by other organizations on the new infants to standard 4 books. During the past three years the Wellington Polytechnic has run each year a series of lectures and workshops for teachers on the concepts covered in the
new books and these have been well attended. Other courses have been held in other centres also by organizations other than the Department of the Institute.

In the First report of the National Curriculum Committee for Mathematics, Infants to Standard 4 in December, 1965, the major consideration the committee felt was the question of in-service training. In the area with which the committee had the most experience there were inadequate facilities and opportunities for in-service training. The committee stated:

"...too little was being done to help all teachers towards a modern approach... those in-service opportunities that were offered were not well conceived nor well organized, there being... too many minor courses with no concern for the real needs of the group attending nor for any appropriate follow-up. Too much of what is done is carried out in the teachers' own time and the resource personnel (teachers, advisers to rural schools, infant advisers and teachers' college lecturers) are having to cope with these demands beyond their normal duties." 8

As a result of this the committee recommended that:

1. full-time advisers be appointed;
2. arrangements be made to have at least a good proportion of the necessary in-service work carried out during the school day;
3. the courses be planned and co-ordinated so that they cater for the progressive needs of the teachers. 9

The question of the appointment of advisers was discussed

9. Ibid.
with the Department and the issue was again raised by the
National Curriculum Committee in later reports.

The problems of adequate in-service training for teachers
came to be felt early in 1967.

At the Annual General Meeting of the Mangonui branch of
the Institute in 1967 the following resolution was passed:

That the Mangonui branch circularize all branches
of the Institute and inform them that this branch
does not wish to put into operation the new arithmetic
books until all teachers working in the areas the
books cover have had adequate practical instruction in
their handling, content, etc., and all necessary
materials are available and that such instructional
courses should be conducted at times other than after
school; and further, that this branch seeks the
support of other branches and requests the Institute
make representations to the Department along the
lines suggested in this motion.

In a note to the National Secretary of the Institute
the Mangonui branch also stated:

that it had been proposed by departmental officers
that the branch should conduct two consecutive courses
from 4p.m. to 9p.m. The branch extends over a very wide area
and some members would have to travel up to 150 miles
to attend such courses, much of this over metalled
roads. In the experience of the branch, courses at
such times as those recommended do not ensure maximum
attendance of teachers and consequently the children
the members teach must be penalized. The branch was told
that there was an urgency about introducing the new course
and that if they do not accept the Department's offer
the teachers will not get the course: it follows that
the children will suffer.

Replies were received from 17 branches of which 17

10. v. supra p.88. Appendix, 1966/64
11. N.Z.E.I. Correspondence file, letter to National
12. ibid.
supported the resolution, one wished to know Institute policy on the issue and the other sought confirmation that there would be no compulsion on teachers to implement the new syllabys until such time as teachers within the schools felt competent to deal with the changes. The Auckland branch passed the following resolution:

That this managing committee supports in principle the problems associated with the introduction of the new mathematics textbooks, the need for accompanying equipment and the need for suitable in-service courses, and urges the National Executive to take action to ensure that such needs are met before the introduction of the new syllabus. 13

The Institute has a firm policy on the matter of syllabus revision which states:

...teachers should be thoroughly prepared for revisions. Handbooks are valuable mainly to supplement courses. Consolidated in-service courses of several days' duration when teachers are free from the responsibility of classes and schools are more effective. 14

The Institute saw the planning and organization of a massive in-service training programme as a vital need of the service and that the appointment of mathematics advisers would help to put this into operation. It also felt that the policy of voluntary attendance at courses was not enough. Teachers should be given the opportunity to attend 'release' courses.

The Institute's concern for adequate preparation of teachers for the new mathematics textbooks was communicated

to the Department 15 and the reply from the Director of Primary Education made the following points:

Temporary advisers in mathematics were to be appointed from 17th July, 1967 for the remainder of 1967 and 1968. Junior Class advisers and rural school advisers would also be available to assist teachers to prepare for the new syllabus and textbooks and in-service courses would be arranged by district senior inspectors as required. 16

The Director went on to say:

...teachers' handbooks, supplementary booklets prepared by the Curriculum Development Unit and other material prepared in local districts would play an important part in helping individual teachers. But there was a need for individual school staffs to accept the major responsibility in planning the most effective use of the material and in providing the guidance necessary for individual staff members. To help teachers further there was to be a change in the Diploma of Teaching course offered by the Department for 1968. 18

At the Curriculum Liaison Committee meeting held in November, 1967 the Department stated that many courses 19 had already been held under the 'Classes for Teachers Regulations', 1967 and that they were considering a series of films on mathematics for television transmission, but that at this time there were certain difficulties, namely, the

15. Letter from National Secretary of the Institute to Director-General of Education. 18/5/67.
16. Letter from Director of Primary Education to National Secretary. 14/7/67.
17. An advisory committee on primary school mathematics, set up by the district senior of schools, Wellington in 1964 had already issued three newsletter/to schools in the Wellington Board area containing suggestions on the teaching of arithmetic.
18. Letter from Director of Primary Education to National Secretary of Institute. 14/7/67.
19. Minutes: National Advisory Council for In-service Training. 16/8/68. 'about 130 classes have been set up this year.'
selection of a suitable selection of films and the convincing of the New Zealand Broadcasting Corporation that such a series was of value not only to teachers but also to the public in general. In an attempt to present a worthwhile case for television time to the N.Z.B.C. the Curriculum Development Unit and the Institute have held several meetings to date to help establish priorities and find a suitable series of films. The use of television for the in-service training of teachers was a high priority recommendation of the Institute's report: 'Education and Television'.

Another aspect of book that has been concerning teachers is its length. At the Curriculum Liaison Committee meeting held in November, 1967 the Institute representatives expressed their anxiety to the Department that June had been suggested as a starting date for the use of this book in a standard clear. The Department admitted that they saw this book as a six-month text but the June date had only been suggested in the hope that teachers would


Chapter 10.

Some Problems with the Use of the Textbooks.

With regard to the use of the textbooks, many teachers have noted that the format of the books suggests that they were originally designed as expendable material. 1 Major criticism has to date centred around book 1 and some of the sections of book 2 as many teachers have found that they must often duplicate pages from the books if they are to eliminate needless written work by the pupils. "The present teacher-time involved in devising and duplicating worksheets is economically wasteful" 2, stated a report of the National Curriculum Committee for Mathematics, Infants to Standard 4.

Another aspect of book 1 that has been concerning teachers is its length. At the Curriculum Liaison Committee meeting held in November, 1967 the Institute representatives expressed their anxiety to the Department that June 1 had been suggested as a starting date for the use of this book in a Standard 1 class. The Department admitted that they saw this book as a six-month text but the June date had only been suggested in the hope that teachers would

1. It is common practice for American pupils' texts to be expendable and some publishers perforate the pages so that they may be torn out easily.
appreciate this fact and plan accordingly. The Department's advice was that teachers themselves should decide as to how the textbooks should be used. At a meeting with the National Curriculum Committee for Mathematics, Infants to Standard 4 in March 1968, one of the points discussed with Cox was this question and he suggested that if Sections 7 and 8 (Oral Problems and More Advanced Addition and Subtraction; Extending Children's Concepts of Numbers above 10 ) in 'Suggestions for Teaching Mathematics in Infant Classes', ( M.I.C.) had not been covered then book 1 of the 'Modern School Mathematics' series (M.S.M.) should not be started. The Institute feels that many beginning teachers, and many teach this level in the primary school, need more guidance than this if they are to feel secure in what they are doing.

In a report to the National Executive of the Institute in October, 1968 the National Curriculum Committee for Mathematics, Infants to Standard 4 continued to show its interest in the problems that teachers are facing in attempting to knit the work contained in the handbook of 'Suggestions for Teaching Mathematics in Infant Classes' with that contained in the 'Modern School Mathematics' series book 2. As a result of research and discussion the Committee resolved:

4. Minutes of N.C.C. for Math, Infants to Std.4. 20/3/68.
1. that this committee is of the opinion that the New Zealand book 1, 'Modern School Mathematics' series is most unsatisfactory in its present form and that even the American book 2 is not a satisfactory link between the 'Suggestions for Teaching Mathematics in Infant Classes' and the New Zealand book 2 'Modern School Mathematics'.

2. no provision should be made for the re-ordering of the New Zealand book 1 'Modern School Mathematics' series when present stocks become unserviceable.

3. the Department should begin immediately on a replacement for New Zealand book 1 'Modern School Mathematics' series.

4. consideration should be given to the fact that the American publication was intended to be expendable.

Supportive argument for these resolutions was as follows:

The main cause of the problem of linking the work contained in the handbook of 'Suggestions for Teaching Mathematics in Infant Classes' and the 'Modern School Mathematics' series appears to lie in the sharp contrast between quite different philosophies that have governed the writing of these two series. The 'Suggestions for Teaching Mathematics in Infant Classes' uses an inductive approach with the children being actively engaged in problem solving situations, through which they are led by the teachers to ideas and concepts. These are linked to earlier experiences and assimilated with ideas and concepts gained previously. The New Zealand edition of 'Modern School Mathematics' book 1 on the other hand, by its format and emphasis is much more finite in its working with an idea; ideas often being handled in isolation and not specifically linked with other ideas. In the New Zealand 'Modern School Mathematics' book 1, in particular, the format fails to suggest that the work is just a guide and a sample, the implication to the insecure or uninterested teacher is, 'just do what is on this page'. This, along with the large number of written examples given is too restrictive, emphasis is placed upon a few methods with the child being right or wrong.

This contrast is also reflected in the emphasis the 'Modern School Mathematics' book 1 places upon counting whereas the 'Suggestions for Teaching Mathematics in

Infant Classes' stresses measuring and grouping.

In many cases the thinking has been done for the child in the 'Modern School Mathematics' series, and in most cases where the child is asked to record, little encouragement and no direction is given to the child recording in more than the one or two ways given. Examples of this appear throughout the book.

It is also noted that each number, as it is dealt with, is restricted and isolated in concept. The child is not directed or encouraged to use an infinite number of arrangements of the number. See p. 63.

From the large number of examples given in the 'Modern School Mathematics' series book 1, especially from chapter 4 onwards, it would appear that the purpose of book 1 is to stabilize and fix facts, yet this is contrary to the goals as stated on page 16 of the teachers' manual and is certainly contrary to the general approach of 'Suggestions for Teaching Mathematics in Infant Classes'.

The committee believes that dealing with each idea to the exclusion of other related ideas, as it does, fails to build up the unity of ideas which is a feature of the 'Suggestions for Teaching Mathematics in Infant Classes' approach. In addition to this, the piece-meal approach of the 'Modern School Mathematics' series becomes most susceptible to rote learning.

Other more specific points which highlight the difficulties involved in the use of book 1 are dealt with in the report under the following headings:

Sets:

While the ideas inherent in sets have been initiated and developed in 'Suggestions for Teaching Mathematics in Infant Classes' the introduction to that topic in book 1 is too abrupt. The committee feels that this problem could be readily overcome by the inclusion of the 15 pages on sets contained in the American edition of the book which is book 2. These pages were omitted from the New Zealand equivalent, book 1.

Numbers:

The goals as set out on page 16 of the New Zealand book 1, teachers' manual aim to 'introduce' the several ideas. In actual fact these ideas have already
been introduced in 'Suggestions for the Teaching of Mathematics in Infant Classes', the goals should involve the development and extension of these ideas.

Up to page 92, number combinations up to 19 only, have been dealt with. This section contains very few new ideas in proportion to the large amount of mechanical work given. The committee feels that the bulk of the work of a purely mechanical nature is out of proportion to the number of new ideas introduced.

All the main ideas up to page 142 have already been dealt with in 'Suggestions for Teaching Mathematics in Infant Classes'. In fact many teachers using book 1 in conjunction with the later sections of 'Suggestions for Teaching Mathematics in Infant Classes' have already covered these pages. Thus book 1 hardly represents a year's work.

Teachers who have not used the book 1 in conjunction with 'Suggestions for the Teaching of Mathematics in Infant Classes' are finding children's interest and enthusiasm dropping away. This is due to lack of any real challenge and feelings of achievement. Whereas the 'Suggestions for the Teaching of Mathematics in Infant Classes deals with numbers up to 100, the first 142 pages of book 1 do not extend these ideas or notation beyond 99. Thus there is a strong feeling that these pages are merely revision. This committee feels that this large block of work impedes the natural 'flow' of ideas inaugurated in 'Suggestions for Teaching Mathematics in Infant Classes'.

In contrast to this slow start, the work involving extensions of these ideas in the book after page 142 are dealt with in too brief, finite and narrow manner with far too little extension of thinking, reasoning or relating of new ideas to those already achieved.

Multiplication:

This idea had been dealt with informally in sections 6 and 8 of 'Suggestions for Teaching Mathematics in Infant Classes' and a little more formally in the appendix where the idea is related to a number line and repeated addition. Book 1 appears to be directed towards the building-up of tables in a systematic and restricted manner.

6. The Department saw book 1 as only a six-month text.

v. supra. - 113.
and does not capitalize upon the ideas of multiplication already developed.

**Division:**

Book 1 does not deal with division although the concept of division as the inverse of multiplication has had sound foundations developed in 'Suggestions for Teaching Mathematics in Infant Classes'.

**Time:**

Many teachers have found that the section on 'time' in book 2 is quite difficult and the committee believes that this may be due to the lack of preparatory work in book 1. Even the green pages give it little mention, (e.g. pp. 18, 19 and 21).

**Measurement:**

Even though p.17 of the green pages of the 'Modern School Mathematics' series suggests that some work in measurement be taken each week, only 12 pages of measurement activities are given. This committee feels that the manner in which mathematical ideas are applied to measurement in book 2 are sound and it deplores the lack of work in book 1 to develop readiness for this. Even able teachers would have difficulty in taking the work in measurement as outlined in the new syllabus (just reviewed by this committee) and fitting it neatly into the present book 1.

In addition to mentioning the above problem areas when book 1 is used as a link between 'Suggestions for Teaching Mathematics in Infant Classes' and book 2, the committee went on to list some suggestions that could be considered when the replacement or the re-writing of book 1 is considered.

1. When children are considering any number, it should be viewed in all its forms including the use of the four operations. All numbers should be related to other numbers on a number line and these in turn related to ideas and methods of measurement. Examples of how this could be done and with what sort of materials

7. The 'green pages' refers to the special introduction that was written for New Zealand teachers in each of the new texts.
and experiences should be included in the teachers' book but not in the children's edition.

2. More inductive and intuitive geometry should be included in order to achieve readiness for the work presented in book 2.

3. The green pages in the front of the book must be accommodated within the book at the appropriate point of reference.

4. Because of the piece-meal approach to the subject in book 1, the committee feels that there is a need for reviews to be included. These should be designed to make clear to the teacher all the ideas developed up to that point, the relationships between these ideas and the main directions in which these ideas are to be extended and developed in the next section of the book.

5. More use could be made of number patterns to assist in learning facts.

6. Although many teachers could be expected to devise the many extra activities needed to supply weekly experience in measurement, the committee believes that few Standard 1 teachers have had sufficient experience with 'Suggestions for Teaching Mathematics in Infant Classes' to enable them to do this and that more help should be given. Chapter 3 in the American edition of 'Modern School Mathematics' book 2 could be included and work on measurement should be spread throughout the book so that mathematical ideas are applied to measurement as they are studied.

7. The committee notes that because parts of the original American edition of 'Modern School Mathematics' book 2 have been omitted from the equivalent New Zealand edition, book 1, the pages in the pupils' book and the teachers' manual do not match. This should be corrected.

8. It is noted that great emphasis is placed on the use of the open abacus. While agreeing that this work is of some value, the committee does not feel that the use of the abacus for computation is sound. Rather that it should be used as a means of leading children to ideas about number systems. It is also noted that the type of abacus used is not readily available in this country. In the light of these facts the committee
believes that additional work involving the use of place value blocks would be of great value when the work done and the methods used in 'Suggestions for Teaching Mathematics in Infant Classes' are considered.

9. Teachers' notes should provide background to the mathematical concepts and the ways in which they were developed in 'Suggestions for Teaching Mathematics in Infant Classes'. The committee believes that this would greatly assist the teachers with insufficient knowledge.

10. The committee agreed that book 1 contains far too much work of a purely mechanical nature involving just 'copying' and 'doing' and not extending or even using the child's thinking ability. It was agreed that if these pages are to be included in any new text, then they should be produced in a form that precluded the need for the child to copy: expendable sheets are recommended.

11. In the light of (10) above, the committee believes that there should be much more work involving open-ended and problem type examples that give the child the opportunity and stimulus to think and reason and select from several possible answers that which is most appropriate to the particular situation and that these should be spread more evenly throughout the book. In this manner, the committee believes that the children should be given greater opportunity to apply the ideas being studied.

12. The committee believes that three weeks per topic, as suggested in the teachers' manual, is too long at this age level. More shorter periods would give greater unity and a less 'compartmentalized' approach to the subject. 8

The arguments thus presented were intended to enable the National Executive of the Institute to make strong representation to the Department in this area, but there are also other problems that have arisen in the use of the new 'Modern School Mathematics' series.

At the same meeting of the National Curriculum Committee

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one of these problem areas was brought to light in a notice of motion from one of the members of the committee.

"That this committee is most concerned that many teachers who are using the 'Modern School Mathematics' series are under the impression that they are required to get children to complete two pages of their textbook each day." 9

In the second of two articles written for 'Education', a Department of Education publication issued to all schools, but not necessarily reflecting the policy of the Department, the chief author of the 'Modern School Mathematics' series, E.R. Duncan stated:

The pupils' work for a day is presented on a pair of pages - back to back for Standard 1 and facing for Standard 2 to 4. This has been done to help the children get a better picture of the unit being presented. Of course, some pairs of pages will require more than one day and others will require less. 10

This statement reinforces a previous one in the same article:

Like the pupils' texts, the teachers' handbooks are arranged in eleven chapters. This arrangement had been planned basically to help teachers pace their work. Each chapter represents roughly three weeks' work. Of course, some classes will take more than three weeks to complete a chapter on which other classes will take less; and some classes will take more than others on any chapter. However a teacher will know that his class is taking too much time if any chapter requires much more than three weeks. 11

11. ibid.
Another problem area of the 'Modern School Mathematics' series is the vocabulary load of the pupils' texts. Dr. W. Elley, New Zealand Council for Educational Research, in discussion with the writer, has confirmed that book 2 has a vocabulary load equivalent to Standard 4 when considered as a reading book. While this would present little difficulty for children who were working through the book with the teacher, any children with reading difficulties who were expected to work through the text at their own rate, and this could happen in multiple-class schools, would have significant problems in extracting information from the text. Likewise, as the books are available for purchase by the general public, any extra-curricular mathematics by children with reading difficulties without adequate help could have detrimental effects on progress in mathematics and reading.

In September 1968, H. A. Bacon, Curriculum Development Officer, outlined the following sequence of action:

(a) the calling of a review conference, usually at Hopdell House at which a report is issued on the next line of action;

(b) consideration of the report to establish guidelines by the Department and the teachers' organisations;

(c) the establishment of a formal revision committee for the purpose of writing a new syllabus, or a working party to initiate and experimental programme, according to circumstances;

(d) the conducting of trials on either the new syllabus or the experimental programme;

(e) a conference would be held at this stage to evaluate experience with the trial syllabus or the experimental programme.

1. This implies comprehensive reports and an evaluation of the trial period.
Conclusions.

The consideration of the extent of the liaison between the Department of Education and the Institute evolves around a number of basic issues.

In the revision of any syllabus the Institute believes that there should be planning, limited trial, evaluation, modification, re-training of teachers and the provision of any necessary equipment with high level and 'grass-roots' discussion before implementation on a wide scale. In many instances the Department would agree with this policy but it prefers not to set too rigid a pattern of syllabus revision.

In September 1968, H.A. Reeves, Curriculum Development Officer, outlined the following sequence of action:

(a) the calling of a review conference, usually at Lopdell House at which a report is issued on the next line of action;

(b) consideration of the report to establish guidelines by the Department and the teachers' organizations;

(c) the establishment of a formal revision committee for the purpose of writing a new syllabus, or a working party to initiate an experimental programme, according to circumstances;

(d) the conducting of trials on either the new syllabus or the experimental programme;

(e) a conference would be held at this stage to evaluate experience with the trial syllabus or the experimental programme; 1

1. This implies comprehensive reports and an evaluation of the trial period.
(f) methods of implementation would be considered next with pilot schemes being considered as a possible method.

Reeves stated that such a procedure should be spread over a period of time, any changes would necessitate in-service training for teachers, which would be initiated as soon as possible and that there should be as much consultation with teachers as possible.

The importance of consultation with teachers pervades both Institute and Departmental policy on syllabus revision but in the introduction of the new mathematics syllabus, Infants to Standard 4, there has been an inconsistency in the amount of consultation between the Institute and the Department.

With regard to the syllabus itself, there has been a high degree of consultation.

Following its establishment in 1965, the National Curriculum Committee for Mathematics, Infants to Standard 4 has offered many suggestions and comments on the content and approach of the syllabus and many of these have been incorporated in revised drafts. The Assistant Curriculum Officers for Mathematics have held at least six informal meetings with this committee, travelling up to Hamilton on each occasion. On all occasions, discussions have been fruitful and this has been the area where consultation has reached its highest peak. At these meetings, the assistant curriculum officers have been made aware of
teachers' opinion and the level of teachers' expertise and any compromise has been carefully considered from all angles.  

The development of that section of the syllabus that was concerned with Standards 1 - 4 was mainly the work of a few Departmental officers who endeavoured to interpolate a programme between the approach developed in the handbook of 'Suggestions for Teaching Mathematics in Infants Classes' and a draft exploratory syllabus for Forms 1 and 2 which even in 1965, was being piloted in some schools. Until the arrival of the 'sample' texts for Standard 1 - 4 area and even up to the time when the first draft was submitted to the National Curriculum Committee in August, 1966, the draft syllabus consisted in the main of a mass of notes of which the committee said "some tidying up of this mass of notes will be necessary before a concise statement can be made available to teachers".  

The first concise statement of the proposed syllabus was presented in one document and submitted to the National Curriculum Committee in December, 1966. The committee agreed that "the draft syllabus was a statement summarizing all the recent developments in the field", but they did however request

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2. The inclusion in the draft syllabus of examples as to how materials could be used was extended to the Std.3-4 area in spite of the Department's concern that such entries might be misconstrued as a departmental ruling that such materials should be used in the middle school.


some minor alterations which were subsequently carried out. It must be stated that the committee was well aware, even at this stage that the syllabus was being developed by a few departmental officers and "..." had not grown out of long-term, extensive research within this country to the same extent as the handbook of 'Suggestions for Teaching Mathematics in Infant Classes' grew out of the work of the 1953 Standing Committee in Christchurch", 5 but they went on to compliment those responsible for preparing such a statement.

It was not until April, 1968 that another draft of the syllabus was submitted to the committee. The Assistant Curriculum Officer for Mathematics, J. Cox, had conferred with the committee in March 1968 and had outlined the changes that had been made since the last draft as "..." suggestions had come thick and fast last year". 6 He agreed to send the committee copies of this draft for the committee's comments and suggestions.

It is significant that books 1 and 2 of the 'Modern School Mathematics' series were distributed to schools in the second term of 1967, and so by the end of the year, many teachers had had a chance to use at least some of the chapters in their classrooms. This suggests that from this

stage, modifications in the syllabus were dictated by the work that was being done from the textbooks and the increasing knowledge of teachers as well as from the National Curriculum Committee.

At this stage the Department was keen to get the syllabus printed so that it would be available for the official introductory date and only a limited time was made available for the committee to submit its comments and suggestions.

In formulating its suggestions for alterations the committee considered the need for clarity of meaning, because "many teachers who are inexperienced, insecure or even disinterested will be required to obtain guidance from it", and in the "recognition given to the ways in which children learn best". The alterations suggested were comprehensive and the committee again stressed its concern that "many sections are included on the recommendation of a restricted number of specialists and without fair trial in New Zealand schools". The committee went on to say "once the Department has considered the recommendations here submitted, and before the syllabus is sent to the printers, the committee would request that a copy of all further alterations made to this syllabus, or

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7. Report to National Executive of the Institute, re alterations in the syllabus. 31/5/68.
8. ibid.
9. ibid.
or a copy of any further draft syllabus be submitted as soon as possible to the Institute for study by this committee." 10

The Department made a close and favourable study of the list of alterations to the draft. Most of them were included in the final draft which was considered by the committee at a meeting on September, 12, 1968. Four further points were raised as a result of this meeting which were discussed with the Assistant Curriculum Officer, J. Cox, at a subsequent meeting on September, 25 to the satisfaction of the committee. 11 A formal request from the Institute resulted in the inclusion of these last four points and the syllabus is now in the hands of the printer.

In summary, consultation on the development of the Infants to Standard 4 Mathematics syllabus has been close and effective. The syllabus has, in effect, been developed as the result of many conferences and discussions with representatives of the teaching profession. In this respect, Institute - Department consultation in syllabus development has been at its highest level.

A similar conclusion cannot be reached in the case of the selection of the textbooks.

The inspection of the proposed textbooks was one of the

10. Report to the National Executive of the Institute, re alterations in the syllabus. 31/5/68.
first jobs of the National Curriculum Committee for Mathematics, Infants to Standard 4 and while it gave its recommendation to the Institute to approve the purchase of the books, it did so on the understanding from the Department that if no approval was forthcoming, it would possibly be years before any substitute series of books could be presented for approval. In its report dated October, 1966 the committee stated..."nothing like it could be produced in New Zealand for many years and therefore teachers have a great advantage, as there is a need for such books and guidance immediately." Because of this the Committee said ..."that there was a need to compromise in order that no real obstruction be raised to the 'whole deal' ". It is important that even under these conditions of expediency and possibly, because slight modifications had to be made to the series to satisfy the demands of the New Zealand situation, many of the modifications and alterations suggested by the committee were incorporated. It also must have been made clear to the National Curriculum Committee that an explanatory section for New Zealand teachers was to be incorporated in the front of each book as it is doubtful whether the committee would have missed such a recommendation when

12. Informal comment to the Institute's Curriculum Officer by N.C.C. members who were present at this meeting with the Department.

given the opportunity.

It is clear from this that there was only limited consultation offered the Institute in the selection of the textbooks for the classes up to Standard 4.

The committee, however, has seen broader issues emerging from the introduction of the new syllabus and textbooks and has recommended accordingly. Two important examples of this have been the provision of supplies of apparatus and material for mathematics and the appointment of advisers.

In its interim report in 1965, the committee stated that there was some evidence that material supplied to schools was inadequate. The committee's concern about the supply of material was even more obvious when it reported to the Institute in August 1966, on the first draft of the syllabus and the 'sample' textbooks, and stated "the need for structured materials ... is greater than ever ... failure to supply these on an increasing scale will reduce the advantages to be gained from the use of the textbooks".

It is significant that when the introduction of the new approach to mathematics in infant classes was ready to be official, J.L. Ewing, Chief Inspector of Primary Schools, told the Institute at a January meeting in 1963 that "the Department will not introduce the new infant number scheme and will not issue the books until 1964.

not then unless the Department has the authority for funds
to buy the necessary equipment”. 15

At this stage the Department was well aware of the need
for mathematics apparatus but with the extension of the
scheme to the middle school there were a number of factors
that must have determined the attitude of the Department.

Perhaps the most important consideration was that of
the cost of the supply of the material. Thousands of
dollars had been committed for textbooks and the Department
felt that an additional request for money for equipment
might prejudice the purchase of textbooks for Forms 1 and 2.
Associated with this was the possibility that even were
supplies of equipment made available, much of it could
very well remain unused as teachers were, especially in the
early stages, still to be convinced of the value of such
material in a mathematics programme. It is true however,
that as the re-training of teachers progressed, more and
more of them became aware of the usefulness of such
material. 16

Another factor, closely allied to this question of
cost, was that of quantity. How much, of what sort of
material should be used, no-one knew, but the Institute was

15. Appendix, 1963 /24; Notes on discussion with J.L.Ewing,

16. v. supra. p.105. Table I, Inservice Training Courses
in Mathematics; There has been an increase in the
number of in-service courses in mathematics available
to teachers.
prepared to investigate. The Department, on the other hand, apart from informing the Institute that the question of the basic list of equipment for primary schools was under review, just accepted the fact that the use of structured material was written into the textbooks possibly in the hope that the situation would solve itself.

The recommendations of the Institute's report on 'The supply of Structured Apparatus' were quite explicit and demonstrated that not only was there a need for such material but also that there was a close relationship between its availability and use. Teachers and parent-teacher organizations should not be expected to continue to supply the equipment needed to implement any departmental syllabus. They have done this in the past because of the experimental nature of what the teachers had been doing. They have anticipated syllabus change and supplied enough equipment in many cases to enable a few teachers to experiment. The Department probably hoped that these organizations and the teachers would continue to do this. A systematized introduction with adequately controlled testing and evaluation would have prevented this as individual schools and teachers would not have been permitted the freedom to experiment as much as they have done. However, had this been so, there would have been less

17. At a Curriculum Liaison Committee meeting in March, 1967, J. Cox admitted that the use of material was written into the textbooks.
18. v. supra, p.63 et seq.
equipment in the schools than there is at present.

There are however, two problems in the provision of apparatus that are still outstanding. One of these, the definition of an adequate supply, has been brought closer to solution as a result of the Institute's report. The Institute, after careful consideration by the National Curriculum Committee for Mathematics, Infants to Standard 4, has defined its list of basic mathematics equipment and this should serve as a term of reference for any discussion with the Department. The Institute is scheduled to consult with the Department on the supply of mathematics equipment in November 1968, but whatever the outcome there is little chance that equipment will be made available to schools before the new syllabus becomes official in February 1969.

The second problem which needs solving is that of the amount of equipment already in schools. Issue of mathematics equipment for schools has continued since the official introduction of the handbook of 'Suggestions for Teaching Mathematics in Infant Classes', but this equipment has been officially designated as infant number equipment. Many schools have added to this basic issue as the need has arisen. So much mathematics equipment is already available in schools that the money required to bring all schools up to a level of adequate supply could well be much less than anticipated. Another factor that is important
is the provision of equal educational opportunity for all children. If the Department persists in this 'head in the sand' attitude, it is not providing this equal opportunity. Too often the schools and teachers who most need the equipment are those who cannot get it from sources other than the Department.

To overcome this problem the Department needs to ascertain through the Education Boards the amount and variety of mathematics equipment in all schools so that all schools can be brought up to a minimal supply.

At this stage however, the official introduction of the new mathematics syllabus and textbooks must go ahead without the necessary equipment if the Department adheres to its plans, yet it cannot be considered to be fully operative until the necessary equipment is provided.

The appointment of advisers in mathematics was one recommendation of the National Curriculum Committee for Mathematics, Infants to Standard 4 that was put into effect by the Department. Although this happened some eighteen months after the initial recommendation, the delay was, in the opinion of the writer necessitated by the lack of personnel sufficiently trained to fulfil the role. Since this time, however, there has been a significant increase in the number of courses held to make teachers conversant with

the new approach to the extent that by the end of 1968
most teachers will have had the opportunity of attending
at least one in-service teacher-release course in the
area of the school in which they are teaching. The
continuation of the appointment of advisers in mathematics
will ensure that there will be further teacher education
where necessary.

There has however, been one aspect of the introduction
of the new mathematics in which there has been no Institute
and Department liaison or consultation whatever. This
is the area of pilot classes and pilot schools.

At no time has the Institute been consulted on which
schools or which teachers should participate in the scheme. 20

In its policy on syllabus and curriculum revision,
the Institute sees a particular role for pilot schools
and classes. The trial of any new syllabus must be controlled
and objectively evaluated and the Institute sees pilot
schools and classes as fulfilling this role.

The research on the role of the 'Pilot school in
Syllabus Revision' 21 differentiates between the Department's
interpretation of the role of pilot schools and that
envisioned by the Institute. The Department appears to have
seen pilot schools and classes as trial schools and classes,

20. Neither has the Institute been informed of who the
schools were, what they were doing or the results they
obtained.

but very often without the inherent concept of evaluation. Some teachers and schools took the initiative themselves to evaluate the work being done and submit this either to the Curriculum Development Unit or the local inspectorate. Certainly many teachers who were invited to become 'pilot' teachers neither evaluated the scheme being tried, other than normal evaluation from a planning point of view, nor were they asked to comment on what they were doing. Indeed many of them became professionally isolated from this point of view and in addition to this, there were many teachers who saw the professional advantages of trying out the new scheme and 'jumped on the bandwagon.'

On all accounts the Department has condoned the confusion between trial and implementation. In no official publication have teachers been made aware of the fact that except for pilot classes, all teachers should have been teaching the official syllabus. With the distribution of the teachers' manuals of the new series, it was suggested by many district senior inspectors that teachers should attempt one or two of the chapters with their classes so that they would become more familiar with the new approach. In this way, teachers were provided with 'do-it-yourself' kits for in-service training in mathematics and this approach, together with specific in-service courses has to all intents and purposes, been successful. 21

21. The provision of teachers' manuals in advance of the pupils' texts may or may not have been the result of a remit to the 1965 annual meeting of the Institute which asked for this. (Remit 1965/105.)
This writer would agree with the statement by the Institute's Curriculum Officer that "in the instance of the new mathematics, an 'a priori' judgement was made and that pilot schools were developed as resource rather than research institutions". 22

It is important that the Institute itself should come under scrutiny for its early handling of the introduction of the new approach to mathematics. It was not until the appointment of the Institute's curriculum officer at the beginning of 1967 that any worthwhile attempt was made by the Institute to take a more aggressive role in determining curriculum content.

The reason for this, the writer believes, can be found in the administrative structure of the Institute. The administrative staff at Head Office consists of: E.J. Simmonds, National Secretary; S.R. Heppleston, assistant secretary; P.D.K. Ramsay, Curriculum Officer; J.W. Goodwin, Editor, 'National Education'; J.P. Delahunty, Salary and Research Officer and a clerical and typing staff. These staff members are full-time employees of the Institute.

The National Executive however, is an elected body whose membership is subject to yearly fluctuations. While there are rarely any radical changes made in the composition

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of the executive, there are always some changes as members resign, retire or become president after which it is usually the custom for them to retire from active participation at executive level following a year as immediate past president. Because of this mobility, delegation of responsibility for Institute activities must also change and while efforts are made to prevent any break in continuity of responsibility for a particular area, such breaks do occur and for a while there can be a lack of communication on some issues.23

A further factor that must also be considered is that except for the President, who by agreement with the Department of Education, is on special leave with full pay for the period of his presidency, all the members of the executive have their occupational commitments to fulfil. Such dual responsibility carries with it the possibility of overlooking some aspects of either responsibility. From this point of view the appointment of a Curriculum Officer must have relieved certain members of the executive of aspects of responsibility for which decisions and meetings were necessary. Many members of the executive are becoming increasingly aware of the fact that in the future, more responsibility for decision must be given to a larger

23. Written comments contained in notes of meetings confirm this. v. supra. p.15, p.18.
full-time administrative staff and thereby reduce the number of part-time administrators who have other commitments to fulfil.

Since the appointment of the Curriculum Officer, there has been a greater liaison and a closer consultation with the Department of Education. In fact rarely a day goes by without informal consultation of one kind or other.

During the past few years, but particularly since 1967, the Institute has shown a greater determination to involve teachers in syllabus and curriculum change. The framework set up is such that teachers at all levels in the profession can play a significant part in any programme of revision and know that their expertise is vital to the successful implementation of that revision.

The Department has always recognised the importance of teachers in any curriculum revision but now the Institute, through its National Curriculum Committees have made available a greater range of teachers' opinion than ever before. This in terms of consultation, will become, if it has not already, a potent force for professionalism in the teaching service.

With regard to the introduction of the new mathematics syllabus, teachers must not become complacent about its adequacy and efficiency. There is a constant need, in any curriculum area for objective evaluation and modification. Care must also be taken to ensure that the
use of the new textbooks does not degenerate into the formalistic approach there was to arithmetic in the past. There is a significant difference between teachers teaching mathematics and children learning mathematics. Teachers must continue to provide opportunity for mathematical discovery in their classrooms otherwise the approach inherent in the handbook of 'Suggestions for Teaching Mathematics in Infant Classes' will have been in vain. There will be therefore a continuing need for in-service training courses, not so much for the purpose of teaching mathematical concepts to teachers but rather for encouraging teachers to be mathematically creative in their classrooms so they can be able to lead children to discover mathematics as a vital and satisfying subject area.
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