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PROGRESS REPORT

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AGENCY FOR INTERNATIONAL DEVELOPMENT

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on the

REGIONAL MATHEMATICS PROGRAMS

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October 6, 1971 to March 31, 1972

Contract AID/afr-711

A.I.D.
Reference Center
Room 1856 NS

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Education Development Center, Inc.
55 Chapel Street
Newton, Massachusetts 02160

May 1, 1972

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Program A79

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PROGRESS REPORT

EAST AND WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

BACKGROUND

A mathematics program for East and West Africa to implement the work of the African Mathematics Program was funded June 26, 1970 by the Bureau for Africa of USAID/Washington. The East African Program includes Ethiopia and Kenya; the West African Program includes Ghana, Liberia and Sierra Leone.

Leadership training institutes, correspondence courses and summer workshops are the main activities of the program. The first batch of some 200 tutors, supervisors and teachers have attended the second round of four Institutes during December 1971/January 1972 to improve their mathematical background. Following the Institutes, the participants will continue with a correspondence course under the maths educators and the general supervision of the Program Administrators. Upon completion of this two-year course, a second batch of participants will follow the same course of training.

The first Summer Workshops were held during 1971 in Freetown, Sierra Leone and Nairobi, Kenya, for the purpose of adapting existing mathematics texts for use in the five countries. A teacher training text is of special interest since no such book has existed for African training colleges.

The writing groups at the Workshop are primarily African; staff consists of African university mathematicians, some mathematicians from the United States and expatriate resident maths educators and editors employed by the Program to assist in this implementation effort. The Program is administered by two Africans: Mr. D. A. Brown, who is located at the University of Cape Coast in Ghana, and Mr. Makonnen Eunatu, in Addis Ababa, Ethiopia.

In general, the Program is intended to make possible the implementation of primary school mathematics curriculum reform by training middle level personnel who will be responsible for pre-service and in-service teacher education and at the same time, to make available suitable local primary materials which will be used in this implementation.

PERSONNEL

General

With the addition, in July 1971, of Professor Roy Dubisch as Maths Editor/Educator in Addis Ababa, and Mr. Roger R. Hartman, Maths Editor in Cape Coast, Ghana, the Program now has its full strength of expatriate personnel in both East and West Africa. Currently, WARMP has two Maths Educators and one Maths Editor under the supervision of Mr. D. A. Brown, Program Administrator. One educator and the editor have been operating from Cape Coast, Ghana; the second educator has been based in Freetown, Sierra Leone. EARMP has one Maths Editor/Educator operating from Addis Ababa and one educator in Nairobi, under Makonnen Eunatu, Administrator.

Responsibilities

The maths educators are responsible for the training of middle level personnel--tutors and inspectors or supervisors--who will undertake pre-service and in-service training of teachers; most of their time will be spent in visits to training colleges. They will also assist local personnel in the adaptation and preparation of materials. In West Africa these materials will be used in teacher training colleges and in primary and secondary schools; in East Africa only adaptation of a teacher training text has been undertaken. The training activities involve institutes for training college tutors and supervisors and are linked by correspondence courses supervised by the educators. Materials adapted at the two workshops are currently undergoing classroom trials in all five countries.

The maths editors will edit the texts adapted at the workshop, supervise the classroom trials of these texts and the activities of the trainee editors.

The local administrators will provide normal backup for the maths educators and editors, setting up and handling the logistics of the institutes, workshops and training college visits, assisting in the preparation and distribution of correspondence courses, administering classroom trials of the adapted texts, maintaining contact with Ministries of Education, informing them of Program activities and insuring necessary cooperation. In addition, the administrators will keep Program records, assist in the preparation of on-going proposals and budgets so that eventually they will become fully responsible for the programs, under Management Committee control.

Plans to Move WARMP Headquarters to Accra

By October 1972, maths tutors in all teacher training colleges in southern Ghana--including the Volta Region--which are not being phased out by the consolidation program of the Ministry of Education, will have been trained sufficiently to teach the modern maths in their colleges. Already most of the colleges have started teaching the modern maths in their method or content classes or in both. During the second phase of the program which begins in October 1972, it is planned to repeat in the northern part of Ghana the work that has been done in the south.

Concurrently with this training program in modern maths, the WARMP is providing training in editorial and evaluative skills for personnel of the Ministries of Education of the participating countries.

Based on experience in the field, some modification of WARMP's internal organization is desirable; in particular an extension of its base of operation is needed. Therefore, the program is to set up an office in Accra in addition to one at the University of Cape Coast. This new office will house the activities of the editorial and evaluation staff as well as those of the Program Administrator. This arrangement is designed to save the program time, money and stress on its personnel.

In the meantime the resident mathematics educator will remain based in the Program's office at the University of Cape Coast. Moreover, this office will serve as the administrative center for program involvement in University pre-service and in-service mathematics education courses for teachers and school supervisory staff. The location of the staff will be as follows:

Mr. D. A. Brown, Administrator - Accra
Mr. Roger R. Hartman, General Editor - Accra
Mr. John T. Norris, Maths Educator - University
College of Cape Coast
Mr. John W. Alexander, Maths Educator -
Freetown

Relocation of Maths Educator, Sierra Leone

Consideration had been given to moving Mr. Alexander, Maths Educator from Freetown to Monrovia. Currently the Program is seeking a residence in Monrovia to enable the educator to function with greater ease while visiting colleges, and schools upcountry. In the past, suitable lodgings have always proved difficult to come by; at times impossible to find. Consequently, this residence will serve both as housing for Mr. Alexander and visiting WARMP personnel as well as an office for the Program. In

addition to this new residence, the Program will retain the Freetown base.

Yale Five-Year B. A. Program Fellow

The Program is considering an applicant from the Yale Five-Year B. A. Program who is interested in spending a year in Africa. This individual would generally assist our activities in WARMP and work with Messrs. Hartman and Norris in Ghana.

In the past, four Fellows of the Yale Five-Year B. A. Program have provided valuable assistance for the African Mathematics Program in Ethiopia and Nigeria.

PROGRAM ACTIVITIES

Institutes

Four Institutes--two in East Africa and two in West Africa as scheduled--were held for tutors, supervisors, inspectors and teachers. This group, representing the first batch of participants, attended the second and final Institute in their respective two-year training period.

Participation was for the most part good. However, the attendance of the Liberia participants at the Kakata Institute lagged for several days. This, in part, was because the Institute schedule coincided with the national celebration of the inauguration of the new President, the Honourable William J. Tolbert, Jr.

The general success of these Institutes can perhaps be stated as an improved attitude on the part of the participants now that they are no longer afraid of mathematics. This attitude was shown by their increased confidence in dealing with mathematics and a willingness to tackle the work presented by the staff. (See Appendices I, II, III, IV.)

4-Day In-Service Course - Monrovia

Through the efforts of Dr. Doris Banks-Henries of the Department of Education, Monrovia, 25 supervisors and teachers representing all the counties of Liberia participated in a 4-day in-service course held at the Department of Education, Monrovia. The purpose of this course was to strengthen Liberian participation in the program. Staff assistance was provided by Maths Educators Jack Alexander and John Norris.

Dr. Henries, a member of the WARMP Management Committee, attended most of the sessions. The Institute was formally opened by the Acting Secretary to the Department of Education, Mr. Cummings. (See Appendix V.)

OUTLINE OF FOUR INSTITUTES FOR TUTORS, INSPECTORS, SUPERVISORS AND TEACHERS

1. Date: December 6-17, 1971
Site: Kenya Girls High School, Nairobi, Kenya
EARMP Administrator: Mr. Makonnen Eunatu
Participants: 20 Maths Tutors, 26 Primary School Inspectors
Staff: Mr. John C. Fitzgerald, Maths Educator, EARMP
Dr. Ed Jacobsen, Mathematics Department,
University of Nairobi

2. Date: December 9-23, 1971
Site: Ramseyer Training Center, Abetifi, Ghana
WARMP Administrator: Mr. D. A. Brown

2. Participants: 43 Maths Tutors
Staff: Mr. John W. Alexander and
Mr. John Norris, Maths Educators, WARMP
Mr. Seth Minta, Ministry of Education,
Saltpond, Ghana
Mr. Andrew Nyame, Maths Organizer, Ministry
of Education, Accra
Dr. Robert Yawin, Curriculum Research
Development Unit (CRDU), Accra
Mr. Jack Williamson, CRDU, Accra
Mr. E. B. Dogbe, CRDU, Accra
Mr. Roger R. Hartman, Maths Editor, WARMP
3. Date: January 3-18, 1972
Site: Junior Teacher Training College, Addis
Ababa, Ethiopia
EARMP Administrator: Mr. Makonnen Eunatu
Participants: 12 TTI Teachers, 39 Supervisors
Staff: Prof. Roy Dubisch, Maths Editor/Educator,
EARMP
Mr. John C. Fitzgerald, Maths Educator,
EARMP
Ato Yohannes Menkir, HSI University,
Science Faculty (African Mathematics
Program)
Ato Girma Mengistu, Head of Mathematics
Department, Ministry of Education,
Addis Ababa
4. Date: January 10-23, 1972
Site: Booker Washington Institute, Kakata,
Liberia
WARMP Administrator: Mr. D. A. Brown
Participants: 38 Tutors, Supervisors and Teachers
Staff: Mr. John W. Alexander and
Mr. John T. Norris, Maths Educators, WARMP
Mr. Roger R. Hartman, Maths Editor, WARMP
Dr. R. O. Ohuche, Njala University, Sierra
Leone
Mr. Seth Minta, Ministry of Education,
Saltpond
Mr. Andrew Nyame, Ministry of Education,
Accra

4-DAY IN-SERVICE COURSE/LIBERIA

1. Date: November 8-11, 1971
Site: Department of Education, Monrovia, Liberia
WARMP Administrator: Mr. D. A. Brown
Participants: 25 Supervisors and Teachers
Staff: Mr. John W. Alexander and
Mr. John T. Norris, Maths Educators, WARMP
Dr. Doris Banks-Henries, Department of
Education, Monrovia, Liberia

Management Committee Meetings

Management Committee Meetings were held in Addis Ababa on January 6, 1972 and in Kakata, Liberia on January 10, 1972. These meetings reviewed such Program activities as:

- a) Legal status
- b) Incentives
- c) Consultant Evaluator's Reports
- d) Classroom trials
- e) Editorial activities
- f) Visits to Teacher Training Colleges
- g) Fiscal control

Both the EARMP and WARMP meetings coincided with the Institutes being held for tutors, supervisors and teachers. To the severe disappointment of those in attendance, the Ministry of Education, Sierra Leone, was not represented at the Kakata meeting.

Miss Elinor Gilliatt, Education Officer of USAID/Accra, attended this meeting and spent some time at the course which was being held at Booker Washington Institute 45 miles northeast of Monrovia. Prof. W. T. Martin of Massachusetts Institute of Technology, long associated with the Program, together with the Director, Mr. John Joanou, attended both meetings. (See Appendices VI, VII.)

Additional Representation for Kenya

Mr. Isaac Hunja, EARMP Management Committee member, of the Ministry of Education, Nairobi, nominated Mr. Kizza from the faculty of Nairobi University, as an additional member to represent that institution. Committee members expressed their unanimous pleasure since the University heretofore had not been represented. Further, Mr. Kizza would be a Kenyan counterpart to the Ethiopian representative of Haile Selassie I University.

Legal Status

a) WARMP's possible association with WACTE: WARMP submitted a paper entitled "Proposal for a Working Relationship with WACTE" to the Council for its consideration.

The West African Council on Teacher Education held a meeting during November 1971 at Cape Coast, Ghana, specifically, to consider the admission of WARMP into its organization. (Unfortunately, the WARMP Administrator, Mr. D. A. Brown, a resident of Cape Coast, was not invited to attend this meeting.) Under this proposed arrangement WACTE would provide both the legal status and the administrative services for WARMP so that the regional program could function as an independent entity, wholly under African control.

The Council has requested Mr. Brown to re-submit the application for admission and to specify more clearly the responsibilities of WACTE under such an arrangement. This task was left to Dr. Henries, Mr. Brown and Mr. Joanou.

b) At the request of Dr. Ayalew G. Selassie, Chairman of the EARMP Management Committee, the Program submitted to the Ministry of Education and Fine Arts, Addis Ababa, a formal request citing the need for establishing legal status for the Program. Under the guidance of Dr. Selassie the Program is expecting official approval by the Ministry. Presumably this initial approval would be subject to agreement by the Ministry of Education, Nairobi.

Correspondence Courses: EARMP

The correspondence courses were reviewed at the Third Institute at Nairobi. Again, at the Fourth Institute in Addis Ababa, all the previous assignments were worked out in groups under the leadership of teacher training teachers.

On the whole the participants' grades--especially those of the Kenyan tutors and inspectors and the Ethiopian supervisors showed promising performance. However, the lecturers from the TTIs in Ethiopia have shown a continuing indifference to the correspondence courses from the inception of the program. Despite the fact that this group are all math graduates, they felt they did not need Probability and Statistics; however, they did poorly in an examination on this subject given by Prof. Dubisch. (See Appendix XIV d, e, f, g.)

The mathematical background of these institute lecturers has been taken for granted, mostly by the lecturers themselves. Consequently, much time in last years' work was spent in "enrichment" rather than fundamentals. Improvement in the correspondence course for 1972 will seek to remedy these

deficiencies. In addition, 1972 assignments will be made more practical, especially for the supervisors.

Correspondence Courses: WARMP

Liberian and Sierra Leonean participation in correspondence assignments is lagging. These participants, teachers, for the most part, and headmasters, are hampered by a heavy teaching schedule. Many of them have a poor mathematics background. Mr. Alexander, Maths Educator has spent a great deal of time in extra sessions, working with a number of the participants individually, to assist them with assignments. In a number of instances, participants are nowhere to be found; some have changed schools but Mr. Alexander has not been notified accordingly. In several instances, assignments have been lost through the mails. (See Appendices XIV b, c.)

All the participants in Ghana are training college tutors. Unlike their fellow participants in Liberia and Sierra Leone, they are not burdened by administrative duties. They have a good mathematical background and are doing very well on their correspondence course assignments. (See Appendices XIV a.

Training College Visits

The maths educators continued their visits to colleges and participants of the 1971/72 Institutes. These visits cover October 1971 and the period February through June, 1972. During this travel the educators visit Institute participants, discuss correspondence course assignments and

assist tutors and supervisors in planning their teachers' courses, pre-service and in-service. Visits to training colleges entail working with the tutors in their classrooms and assisting in implementing the approved syllabus through classroom techniques more relevant to the sort of classroom approaches which seem to be desirable.

Reports of the visits and discussions with the participants are detailed in Appendices X, Xa, b, c, XI, and XIIIa, b.)

Appointment of Trainee Editors and Evaluators

Trainee Editors and Evaluators have been appointed by participating countries with the exception of Sierra Leone. The Ministry in Freetown has decided that a single trainee editor cum evaluator would suit their requirements and declared its intention to appoint such a trainee. Both Mr. S. Thomas and Mr. M. A. J. Bockarie, active participants, have been recommended for this post by the Program. However, to date, no appointment has been made by the Ministry.

Status of Trainee Editors and Evaluators

WARMP

Ghana

Editor:	Mr. E. B. Dogbe, Senior Education Officer, (Mathematics) Curriculum Research Development Unit, Accra
Evaluator:	Mr. Seth A. Minta, Education Officer, Saltpond

Liberia

Editor: Mr. W. Momolu, Tutor, Zorzor Rural Teacher Training College, Zorzor, Liberia

Evaluator: Mr. Joe L. Bettie, Instructor, Monrovia High School District, Monrovia

Sierra Leone

Recommended: Mr. S. Thomas
Mr. M. A. J. Bockarie
(No appointment to date)

EARMP

Ethiopia

Editor: Ato Kebede Teku, Ministry of Education and Fine Arts, Addis Ababa

Evaluator: Ato Girma Mengistu, Math Texts Adaptations, Ministry of Education and Fine Arts

Kenya

Editor: Miss Sushila Bakhda, Tutor, Shanzu Training College, Mombasa

Evaluator: Mr. Gideon M. Kimote, Head of Mathematics Curriculum, Kenya Institute of Education, Nairobi

Consultant Evaluator Visits Institutes

Dr. Bernard Shapiro, Consultant Evaluator, visited the Institutes at: Ramseyer Training Center, Abetifi, Ghana; Junior Training College, Addis Ababa; and Booker Washington Institute, Kakata, Liberia. Dr. Shapiro observed the participants at the Institute, discussed evaluation plans with the participating trainee evaluators and presented an Evaluation Report at both Management Committee Meetings in Addis Ababa and Kakata.

Evaluation Reports: Dr. B. Shapiro

Kenya

1. Entebbe Control Comparison: 7 Nairobi classes using Entebbe vs.
7 Rural classes using traditional maths

Trainee Evaluator to:

- a) Construct new test instrument suitable for this comparison on Primary Four level
 - b) Analyze Teacher Training Questionnaires and prepare report
 - c) Analyze pre-test and post-test data
2. Preparation of Institute and Correspondence Course report

Ethiopia

1. Trainee Evaluator to:
- a) Analyze Teacher Training Questionnaire and prepare report
 - b) Prepare analysis of each participant based on Correspondence Course participation
 - c) Construct instrument for pre-tests and post-tests for Second Ethiopia Group

Ghana, Liberia, Sierra Leone

1. Primary Three and Four test materials to be administered to those classes consistently using Entebbe program (3 or 4 classes at each level)

Institute Program: Ghana

1. Pre-tests and post-tests administered to participants (all tutors)
2. Participants expressed satisfaction with Institute, attendance excellent, however, they are dissatisfied with the Correspondence Course

Institute Program: Liberia, Sierra Leone

1. Participants were mostly teachers and supervisors, few tutors
2. Liberian participation very poor at Kakata Institute
3. Sierra Leone participation very good at Kakata
 - a) Their response was positive toward Institute but less appreciative of Correspondence Course
 - b) They indicated more frequent visits by Maths Educator would do more to raise level of offering at Teacher Training colleges

In addition to the foregoing activities, all trainee evaluators will attend a special Evaluation Course at Ibadan, September/December 1972. (See Appendices VIII and IX.)

Classroom Trials/Evaluation and Editorial Activities

1. Classroom Trials and Evaluation: WARMP

Printing of Materials: Manuscripts from the first Workshop were transferred onto stencils. WARMP's efforts to print primary, secondary and teacher-training materials for classroom trials in Ghana, Liberia and Sierra Leone have been plagued by serious bottlenecks. (See Schools Participating in WARMP Classroom Trials, page). Responsibility for editing and duplicating these materials and coordinating the classroom trials rest with Roger Hartman, WARMP General Editor, based at Cape Coast, Ghana.

Equipment Failure: Duplicating equipment at the University College of Cape Coast was in constant use during normal working hours for University requirements. Hence, most of the Program's duplicating had to be done after hours or on weekends with the assistance of Messrs. Alexander and Norris. Frequent equipment failures experienced due to overtaxed facilities brought about additional delays and expenditures for repairs. Duplicating facilities were used at several other surrounding institutions, including CRDU*, Accra and as far away as the University of Science and Technology at Kumasi, over 100 miles north of Cape Coast.

Shipping Delays: Dispatching the materials proved difficult and entry into Liberia and Sierra Leone was further hampered by customs difficulties.

*Curriculum Research and Development Unit

Lack of Feedback: It has been impossible to obtain feedback from schools and training colleges in the three countries selected for classroom trials because the trainee evaluator has not yet been appointed in Sierra Leone and Liberia has not provided release time for its appointee. In the case of Ghana, the trainee evaluator, Mr. Seth G. Minta was not released until late February of 1972; nonetheless, the evaluation program is working in Ghana, albeit a bit tardy.

No Contact with Cape Coast: Mr. Hartman spent much of his time locating schools in Sierra Leone and transporting trial materials to them. The materials were late in arriving; there has been no contact with the teachers of the trial classrooms at the primary and secondary level. Without the trainee evaluators on the spot, there is no link to WARMP headquarters and Mr. Hartman at Cape Coast.

2. The Editorial Program

Editing Manuscripts: All materials were pre-edited at the Workshop to some degree by the Writing Group Chairmen. The second stage editing was done by Mr. Hartman. Stencils were prepared to print the trial edition. The third stage which involves editing on the basis of the analysis of data from the trial classrooms is only just begun. This final editing has been seriously curtailed because Mr. Hartman was obliged to carry out the duties of the trainee evaluators in addition to his own duties.

Training of Trainee Editors: Mr. Dogbe, trainee editor for Ghana, has met regularly with Mr. Hartman and has proven to be a great asset to the Program. Mr. Dogbe, Dr. R. Yawin and Mr. J. Williamson, all members of CRDU, have carefully reviewed the teacher-training text and submitted

their reactions to Mr. Hartman. Some training has been accomplished with Mr. W. Momolu, trainee editor for Liberia, at the Workshop and through correspondence with Mr. Hartman (See Appendix XII.)

1. Classroom Trials and Evaluation: EARMF

The teacher-training text adapted at the 1971 Nairobi Summer Workshop Fundamental Concepts of Mathematics is being tried in Ethiopia at the Junior Teacher Training College, Addis Ababa and Debre Berhan Teacher Training Institute at Debre Berhan. Trials began in late September 1971. EARMF had only the teacher-training text to adapt. This text was edited by Prof. Dubish, Maths Editor/Educator, printed in Addis Ababa and distributed to the trial classrooms with relative ease.

Classroom trials of Fundamental Concepts began January 1972 in two training colleges in Kenya. This preliminary edition has been received most enthusiastically and is first on the list of texts recommended by the Kenya Institute of Education.

Trainee Editor and Evaluator: Ethiopia's Ministry has appointed a new trainee editor, Ato Kebede Teku. Ato Kebede will begin training at the forthcoming summer workshop. The trainee Evaluator, Ato Girma Mengistu has not yet been released; however, since the teacher-training text is the only text under trial at two colleges in Ethiopia, the problem of lack of proper feedback is much less than that of West Africa.

The Kenyan Trainee Editor, Miss Sushila Bakhda began her training at the 1972 Nairobi Workshop under the guidance of Prof. Dubisch. There is a strong likelihood that Miss Bakhda, a tutor at Shanzu Teacher Training College, Mombasa would be transferred to the Kenya Institute of Education, Nairobi.

Mr. Gideon Kimote, Trainee Evaluator has met with Dr. Shapiro, Consultant Evaluator on a number of occasions and has begun a series of evaluation tasks outlined in Dr. Shapiro's report. Mr. Kimote is a member of the EARMF Management Committee and is Head of the Mathematics Department at KIE.

Preparation of Teachers' Guide for "Fundamental Concepts of Mathematics"

Fundamental Concepts has been well received by both the Ethiopian and Kenyan training colleges, schools, and EARMF participants. However, Prof. Dubisch has recommended the preparation of a Teachers' Guide for this training text as an additional teaching aid to better suit Ethiopian requirements. This Guide will be prepared at the forthcoming 1972 Nairobi Summer Workshop.

Evaluation Questionnaires

An Evaluation Questionnaire was sent to the Kenya participants to elicit their views on various Program activities. An analysis of the replies gave a general indication that the Institutes were the most popular activity followed by the visits of the maths educators to the training colleges. Results also indicated that the respondents assisted with in-service programs involving as many as 8,129 participants. Consistent with feelings of their fellow participants in West Africa, these Kenyans disclosed mixed feelings and a general distaste for the correspondence course assignments as compared to other activities. For additional details please see Appendix XVa.

USAID/Washington Visit to Africa

Dr. Edwin L. Martin, Chief Education Officer, Africa Bureau, USAID/Washington visited West Africa during November 1971. Dr. Martin stopped briefly in Accra to visit Mr. D. A. Brown, WARMP Administrator and better acquaint himself with Program activities.

Fiscal Control

The problems of the administrators in observing accounting procedures consistent with AID requirements and EDC practices together with related problems of operating in Africa were discussed at length at both Management Committee Meetings in January. Through the counsel and assistance of the EDC Accounting Department, the Administrators have cooperated in rendering more accurate accounts to enable EDC to promptly recover operational funds that have been transferred to Africa for Program activities.

Management Committee Meetings

The next Management Committee Meetings will be held concurrently with the Summer Workshops in East and West Africa.

PLANS FOR 1972

Summer Workshops

Both Summer Workshops will be held during the same period, July 17-August 25, 1972. WARMP will hold its Workshop at the University of Legon, Accra; EARMP will meet again in Nairobi.

The Accra participants will undertake adaptations of Primary Three and Four, Secondary Two and the second volume of a Teacher Training Text.

The Nairobi participants will prepare a Teachers' Guide for Fundamental Concepts of Mathematics, which was adapted at the 1971 Workshop.

Trainee Editors will participate at the Workshop both as members in a writing group and as trainees in editorial tasks under Maths Editors/Roger Hartman and Professor Dubisch. The Trainee Evaluators will meet and discuss evaluation tasks with Dr. Shapiro and the editors.

Institutes to be held in December 1972/January 1973 will accommodate the second batch of trainees in both East and West Africa. Following the Institutes these individuals will pursue a correspondence course with the maths educators under the general supervision of the Program Administrators.

Ibadan University: Evaluation Course

Dr. E. A. Yoloye of Ibadan University, Nigeria, is preparing a one semester course on evaluation for the five trainee evaluators to be offered during September-December 1972 at Ibadan. All expenses including tuition, board and lodgings, books and travel will be borne by the Program. An outline of Dr. Yoloye's course will be found in Appendix XVII.

Subsidiary Mathematics Text

A second meeting not under EARMF support to pursue the preparation of a Subsidiary Mathematics Text was scheduled for April 1972. The need for this text in East Africa has been firmly established and EARMF Management Committee members have expressed their support for this objective. The Committee hoped to support a two-day meeting towards the end of the 1972 Nairobi Workshop for follow-up work on this text.

In-Service Emphasis

At the last EARMP Management Committee Meeting Ministry representatives of both Ethiopia and Kenya expressed the desire for added emphasis on in-service courses and instruction on how to conduct such courses, including the participation of the Maths Educators in these courses. Prof. Dubisch proposed that he hold more in-service courses for primary teachers as a more effective way of reaching the Ethiopian supervisors. Mr. Fitzgerald has cooperated with the KIE in preparing a scheme for one-day in-service courses in Kenya. Committee members agreed that this emphasis would benefit both countries. However, Mr. Joanou pointed out that the major effort of the Regional Programs is on middle level personnel--tutors and supervisors. In keeping with this objective, the Ministries of Ethiopia and Kenya have been requested to prepare a formal statement on this subject of added emphasis on in-service courses so that the maths educators are not deterred from the stated Program objectives.

AID Evaluation Plans

AID/Washington is planning an evaluation of both the Regional Maths Program and the Science Education Programme for Africa (SEPA) independent of Dr. Shapiro's current Evaluation Plans underway by the Program.

Africa Trip

Mr. Joanou has planned a spring visit to Africa to discuss program matters with the local administrators and Ministry representatives in the five participating countries.

STATUS OF THE PROGRAM

PROBLEMS

Evaluation Plans in Jeopardy

Dr. Shapiro, Consultant Evaluator, has stated that his

"approach to the idea of evaluation is not from the standpoint of good or bad programs but from feedback--on a continuing basis--to provide information for summary and comparison studies on program activities including the Institutes, Workshops and Correspondence Courses."

Long delays in appointing trainee evaluators together with continued delays in providing release-time have not only hindered the evaluation effort but have been damaging to the overall purpose. Some problems are:

1. Sierra Leone has not yet appointed its trainee editor cum evaluator.
2. During the entire two-week institute at Kakata the Liberian Trainee evaluator was nowhere to be found. Consequently, Dr. Shapiro was unable to discuss evaluation tasks.
3. Of the four countries who have made appointments only Ghana has given formal notification of approval of release-time for its trainee evaluator.

The evaluation plans were to provide the program with competent trainees from each country who would obtain the data necessary for evaluation efforts and analyze these data under the direction of Dr. Shapiro.

The purpose of this on-the-job training was two-fold:

- a) accomplish necessary evaluation tasks
- b) provide the trainees with valuable experience

The appointees were to do a variety of increasingly sophisticated evaluation tasks. This experience was to have formed a sound background for the proposed three-months special Evaluation Course at Ibadan, scheduled for September/December of this year. Thus far, no tasks have been completed.

The alternative of using university-based African personnel in place of the trainee evaluators while useful, would negate the original purpose, hinder the Ministries from developing any evaluation expertise and delay the establishment of an evaluation component in a curriculum resource area. (See Appendices VIII and IX.)

If the evaluation scheme is to succeed, it is of the utmost importance that the Ministries promptly provide the release-time to allow the trainee evaluators to accomplish the necessary evaluation tasks set forth by Dr. Shapiro. It should be noted that program evaluation set forth is in keeping with the wishes of both the Ministries of Education of the participating countries as well as the funding agency, AID/Washington.

Camera-Ready Copy Delay

Added responsibilities entailed in the preparation and duplication of mimeographed trial editions of primary, secondary and teacher-training materials in sufficient quantities for shipment to trial classrooms in Ghana, Liberia and Sierra Leone, have taken a heavy toll of Maths Editor, Mr. Hartman's time. Consequently, until recently, he has been unable to begin editing the adapted texts in preparation of camera-ready copy, which was originally scheduled for completion around November 1, 1972.

Lack of proper duplicating facilities, breakdown of equipment, together with the problems of obtaining paper in sufficient quantities are factors which have contributed to this delay.

Production of Classroom Trial Editions: WARMUP

Trial editions of pupil texts and teachers' guides of primary and secondary texts and a teacher-training text must be reproduced -- a few

chapters at a time -- in sufficient quantities and dispatched to trial classrooms in the three participating countries in West Africa.

Equipment to be Obtained

In order to provide the trial editions -- 1,540 copies of pupil texts and 40 copies of teachers' guides -- and the camera-ready copy, equipment should be obtained as follows:

1. A copy machine/stencil maker
2. A duplicating unit
3. A filing cabinet
4. Two electric typewriters

Once this equipment is in hand the Program will be able to reproduce the trial editions without recourse to the generally unreliable duplicating facilities in the surrounding area. The Program will seek approval from AID/Washington for these purchases which under ordinary circumstances is not allowed. In addition the trial materials will require some 850 reams of paper. Two local typists will be hired for preparation of the camera-ready copy.

IMPACT

a) Through Program activities the teaching of new maths has been spreading rapidly in teacher training colleges in Ghana. Mr. Norris, Maths Educator, together with Mr. Yawin and Mr. Jack Williamson, both of the CRDU, Accra, made a survey in October 1971, to determine changes in maths staffs, level of new maths teaching and which colleges could best benefit from intensive visits. Their survey included eighteen training colleges in the Volta and Eastern Regions. They found that the amount of maths taught in the colleges involved with WARMP was more widespread than in those colleges not yet involved in the Program. The college administrations and teaching staffs have shown real interest to move ahead as quickly as possible. The National Teacher Training Council has approved a new modern maths syllabus for the training colleges. Only the lack of adequate textbooks is hindering a total switch to modern maths teaching.

b) Trials of Fundamental Concepts of Mathematics underway in Kenya at Highridge Teacher Training College, Nairobi, and Siriba Teacher Training College, Maseno, have been reported as "most satisfactory."

c) The Professional Committee of the Ministry of Education, Nairobi, has recently approved a Primary Three Syllabus listing Fundamental Concepts as the training colleges' prime text.

d) Establishing a residence/office in Monrovia will greatly assist Jack Alexander in making his round of visits to the colleges and schools in Liberia and provide housing for visiting personnel.

e) Once WARMP Headquarters effects its move to Accra, the heavy duties of the Administrator and the Editor will be greatly facilitated--especially the reproduction of trial materials.

f) As the Program grows in terms of the Institutes, participants have shown excellent attendance (for the most part), keen interest and more willingness to tackle math problems. Their correspondence course grades have improved.

* * * *

Education Development Center and the Program Management Committees are grateful to the USAID officials in Washington and in the field who have provided continued support and counsel for this implementation program.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM
REPORT
for the
THIRD INSTITUTE FOR TRAINING COLLEGE TUTORS
AND PRIMARY SCHOOL INSPECTORS

Prepared by: Mr. Makonnen Eunatu

Location: Kenya Girls High School, Nairobi, Kenya
Date: December 6-17, 1971

PREPARATION

a) Site

Participants of last year had expressed their wishes for a change of site for this Institute in spite of their satisfaction with the arrangements of the Kenya High School. One of the places mentioned as a possible venue was Shanzu Teacher Training College in Mombasa. However, Mombasa was dropped for the fact that it would be too warm at this time of the year for the highlanders and not so conducive for serious work. During the Summer Workshop the Administrator approached Mr. Isaac Hunja to request Lenana High School in Nairobi for their facilities, which he kindly did. This too was dropped because the Administrator was informed that the standard of facilities of this school was not up to that of Kenya High School.

Kenya High School was, therefore, once again requested and were kind enough to take us in.

b) Invitations

An invitation for participants was forwarded to the Kenyan Ministry of Education which in turn sent a circular to all Provincial Education Officers and to Principals of Teacher Training Colleges asking them to send their participants to the Institute.

c) Time Table

At their November meeting in Nairobi, Maths Editor/Educator Prof. Roy Dubisch and Maths Educator Mr. John Fitzgerald prepared a tentative schedule for the Institute. When later a similar time table was prepared for the Addis Institute the Administrator discovered that two important topics (Teaching in the T.T.C. and Secondary School Mathematics) were missing in the Nairobi Institute Schedule. These were left out from the Nairobi Institute merely because the time was shorter than the Addis Institute. However since the Nairobi Institute was residential, an amendment of the schedule

was despatched to all participants informing them that the two topics would be included either on Saturdays or on evening sessions. The evenings were later preferred and the two topics were given on December 14 and 16.

A residence program and information sheet was also prepared by Kenya High School.

The Tentative Schedule and an evaluation questionnaire were sent to the participants.

d) Other Arrangements

On December 1, 1971 the Administrator flew to Nairobi to ensure that everything was in order.

As Mr. Isaac Hunja, Mr. G. Oluoch and Mr. Ben D. Odhiambo of the Inspectorate were on leave, Mr. H. Kanina the Chief Inspector of Schools was contacted and requested to open the Institute. However he too was due on leave on the opening date. Upon the suggestion of the Administrator, therefore, Mr. Kanina kindly asked Mr. P. M. Kareithi S.E.O. (Teacher Education) to open the Institute. Mr. Kareithi was willing to do so and asked the Administrator to give him some background notes on the program.

The Press, Daily Nation and East African Standard, were contacted and asked to cover the Institute, who promised to do so but as usual did not show up.

The Kenya High School was visited and whatever materials were needed were lined up.

STAFF

a) Lecturers

Professor Roy Dubisch: Maths Editor/Educator, EARMP
Mr. John Fitzgerald: Maths Educator, EARMP
Dr. Ed Jacobsen: Guest Lecturer, Mathematics Department,
University of Nairobi

b) Administration

Mr. Makonnen Eunatu: Program Administrator, EARMP
Mrs. Eileen Bowman: Secretary

THE INSTITUTE

a) Opening

Some of the participants arrived at the Kenya High School on Sunday Afternoon December 5 and with the exception of very few the rest were present on December 6, 1971.

On the morning of December 6, 1971 Mr. P. M. Kareithi, S.E.O. for Teacher Education, officially declared the Institute opened after a lively speech in which he summarized past, present and future activities of East African Regional Mathematics Program. He stressed the importance of modern mathematics in this developing region of Africa where the new approach is in the process of adaptation. In concluding his speech he expressed his appreciation to the Agency for International Development, to EDC and to the Program and wished the participants success in their endeavours.

b) Participants

The Ministry of Education had sent invitations to twenty-three teacher training college tutors and to twenty-seven Primary School Inspectors and Assistant Inspectors. Out of these, twenty tutors and twenty-six Inspectors and Assistant Inspectors attended the Institute. The Tutors represented twenty teacher training colleges and the Inspectors represented all Provinces and most Districts.

Out of last years Tutor participants nine did not come for this Institute but were replaced by eight new Tutors.

Similarly out of last year's Inspectors, three did not show up but were replaced by five newcomers. Thus we had a total of forty-six participants at the Institute. (Annex I). All but two of the participants stayed at the Kenya High School. Mrs. S. Nderitu, a Nairobi Tutor preferred to stay home and was paid transport allowance. Mrs. Nellie Onyango had a baby and could not be permitted into the school with her baby because of school regulations. She therefore stayed in town and was paid an equivalent sum of residence costs for her stay. Sister Kathleen Cooke, Mrs. Onyango and M. E. S. M. Kibutha left the Institute at the end of the first week. Their reasons were: Christmas season, family obligations and approved leave respectively.

c) Books and Other Materials

New participants who were not in possession of books distributed last year (Basic Concepts 1, 2 & 3, Handbook for Primary Teachers & Mathematics Syllabus Source Book) were given copies.

Mr. Gideon Kimote kindly borrowed us some Entebbe and Kenya Primary Books for use at the Institute.

One copy of the trial edition of Fundamental Concepts of Mathematics for Primary School Teachers was distributed to each tutor to pass them to their respective principals. Letters to this effect were directly sent to the Colleges. Three of the Colleges not represented at the Institute had their copies posted direct. The Tutors were also given four new correspondence assignments.

d) Other Activities

For complete subject matter coverage Ref. to Maths Educators Reports Parts II & III.

A small library was set up for reference purposes. This consisted of a collection of books made available by Prof. Dubisch and Mr. Fitzgerald and a few of the program books.

Demonstration classes were carried out in a nearby Primary School (Keleleshwa Primary School) earlier arranged by Mr. Fitzgerald in cooperation with the Ministry. The Kenya High School provided a school bus to transport the participants to and from the demonstration school.

Two Evaluation Tests were given. The first, WEAMP/TB/1, was given to all participants and the second, FINAL EXAMINATION, was given to Tutors.

e) Evaluation Questionnaire (Annex II)

An Evaluation Questionnaire was sent to the Kenya Participants together with the Tentative Schedule to be filled up and sent to the Administrator. Only eighteen of the participants responded to the request. Although it was difficult to tabulate the results, attached to questionnaire is an attempted analysis which seems to give a general indication that the Institute is very popular followed by visits of the Maths Educator. On the other hand the response to correspondence courses seems to be rather controversial with uncertainties and mixed feelings. On professional knowledge (A.2) the effect has been beneficial or partially beneficial to nine out of eighteen, has no effect to two, defective to one and twelve have stated time shortage. On professional duties, (B.2) to seven it has been beneficial or partially beneficial, to ten of no effect, to one defective, and seven have reported time shortage. On the other hand (under E1.b) four have asked for more content of the correspondence courses, eleven would like it to continue as it is as present, only two would like to have less and one is indifferent. Again (under E.3 other ideas) some of them have suggested to drop written assignments.

The questionnaire has revealed that most of the participants have been active in in-service programs involving 8,129 or less participants. This figure could be less because some of them have indicated

that they have given in-service courses at the same place and date with other respondents of the questionnaire. However, the number of personnel in-serviced varies according to each respondent even though the place and date may be the same, thus rendering it impossible to find out the correct number in-serviced. Problems encountered at the in-service courses are rather varied and unique to each respondent and very little common problems are encountered.

Suggestions (under E.1 and 3) are again varied with even two respondents rarely agreeing on the same idea.

f) Correspondence Assignment Results (Annex III)

Correspondence assignment results of the year show that only one Tutor and two Inspectors have completed all assignments (19 assignments for Tutors and 15 for Inspectors). Seven of the Tutors and seven of the Inspectors have done 50% or more of their assignments. Two of the Tutors and six of the Inspectors have not attempted any assignment. However one of these tutors and two of the supervisors are no longer in their previous post.

g) Closing

The Institute was concluded on December 17, 1971. Ministry officials, the Principal and Vice Principal of Kenya High School and staff and participants of the Institute were invited to the closing session. Very few of the invited guests were able to come. Even most of the participants did not wait for this meeting.

CONCLUDING REMARKS

The Kenya High School once again proved to be a very comfortable and convenient venue for our Institute. A representative of the participants expressed his appreciation on behalf of his colleagues to the staff of the school. In fact he stated that the participants would prefer Kenya High School to any other venue for future courses should they be given the option.

The participants seemed to be more interested in this Institute than last year for the reasons given in the Educators Reports. However still better performance could have been achieved with more feeling of the presence of Ministry Officials.

Now we have accepted new participants in this Institute it is anticipated that we shall have a problem next year in issuing certificates of participation. The new participants shall not be equal to the others in materials covered nor could they be expected to gain much from another Institute with fresh participants. Issuing to them the same certificates or dismissing them without any would, therefore, be unrealistic and impractical. The best solution may be to prepare a one year participation certificate.

Makonnen Eunatu
Programme Administrator

PARTICIPANT LIST

EARMF INSTITUTE

Kenya Girls High School, Nairobi
December 6-17, 1971

TRAINING COLLEGE TUTORS

- | | |
|-----------------------------|-------------------------------------|
| 1. Agesi, Sosi | Kaimosi T.C., P.O. Tiriki |
| 2. Bakhda, Sushila (Miss) | Shanzu T.C., Box 90533, Mombasa |
| 3. Cooke, Kathleen (Sister) | Loreto T.C., Private Bag, Kiambu |
| 4. Githira, Francis Ndungu | Kilimambobo College, Box 8, Thika |
| 5. Juma, Washington Atieno | Siriba T.C., Private Bag, Maseno |
| 6. Kabouthi, E. | Machakos T.C., Box 124, Machakos |
| 7. Kahuthu, M. G. | Kagumo College, Box 18, Nyeri |
| 8. Kibuku, Stephen Waweru | Kamwenja T.C., Box 152, Nyeri |
| 9. Kuria, Peter | Thogoto College, P.O. Kikuyu |
| 10. Lewis, S. | Kiteta T.C., P.O. 65, Machakos |
| 11. Mwangi, David K. | Mosoriot T.C., Private Bag, Eldoret |
| 12. Nderitu, S. (Mrs.) | Highridge T.C., Box 43005, Nairobi |
| 13. Ngari, Joe B. G. | Kigari T.C., P.O. Embu |
| 14. Odhiambo, Benjamin | Kisii T.C., Box 408, Kisii |
| 15. Odumee, Zephania | Kericho T.C., Box 10, Kericho |
| 16. Ogola, Odongo | Eregi T.C., P.O. Box 100, Maragoli |
| 17. Okoth, John T. | Asumbi T.C., P.O. Box 119, Kisii |
| 18. Onyango, Nellis (Mrs.) | Kitale T.C., P.O. Box 485, Kitale |
| 19. Peake, Joseph William | P.O. Box 25, Nyeri |
| 20. Shihundu, John A. | Chadwick T.C., P.O. Box 2, Butere |

PARTICIPANT LIST

EARMP INSTITUTE

Kenya Girls High School, Nairobi
December 6-17, 1971

PRIMARY SCHOOL INSPECTORS

1. Agutu, A. A. C.	P.O. Box 137, Kakamega
2. Ambiso, Walter K.	P.O. Box 15, Busia
3. Chibudu, Samson	P.O. Box 90204, Mombasa
4. Dulo, Shaphan	P.O. Box 79, Kisii
5. Gitemi, J. M.	P.O. Box 1, Kerugoya
6. Kamubutho, F.	P.O. Box 123, Embu
7. Kibutha, E. S. N.	P.O. Box 208, Nyeri
8. Kinyanjui, R. N.	P.O. Box 118, Murang'a
9. Ludeki, E. A.	P.O. Box 259, Nakuru
10. Machogu, P.B.D.	P.O. Iten, Via Eldoret
11. Memon, Badrudin E.	P.C. Box 9, Kiambu
12. Mote, J.	P.O. Box 371, Eldoret
13. Munene, S. N.	P.O. Box 35, Kitui
14. Munyanjua, N.	P.O. Box 80, Myeri
15. Muthamia, H.	P.O. Box 28, Machakos
16. Mwangi, E.	P.O. Box 61, Meru
17. Ndinika, James J.	P.O. Box 9, Kiambu
18. Njoroge, J. K.	P.O. Box 28, Machakos
19. Odundo, A. A. Ater	P.O. Box 1914, Kisumu
20. Omukhulu, Erastus	P.O. Box 36, Kapsabet
21. Ongile, Daniel O.	P.O. Box 78, Homa Bay
22. Oyugi, James R.	P.O. Box 199, Siaya
23. Rono, P.	P.O. Box 149, Kericho
24. Sitima, T.M.	P.O. Box 253, Kakamega
25. Thoya, Shadrack T.	P.O. Box 42, Kilifi
26. Warsame, Said Adan	P.O. Box 8, Garissa

EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

Report on the Kenya Institute,
Held at Kenya High School, Nairobi
December 6 - 17, 1971

by

Roy Dubisch, Maths Educator

I. The program followed the tentative schedule (attached) quite closely with the additional items as per the memo of Mr. Eunatu scheduled for the evenings of December 14 and 16. The changes were as follows:

- 1) In the first two afternoon sessions I met with the six tutors who were new to the course to give them assistance on last year's work.
- 2) On the third afternoon I met with all the tutors to discuss the homework assigned the previous day.
- 3) On the afternoon of December 14 we turned over the supervisors, at the request of K.I.E., to a discussion of problems of teaching English. This was not entirely unconnected with our program since some of the difficulties that Kenya children have with learning mathematics stem from language difficulties. The tutors examined books in the library during this period.
- 4) A library was established in one of the classrooms and supervised by tutors from 4:30 pm - 6:30 pm. Books could be withdrawn when the library closed for the day. In the library were various "enrichment" books such as those on the Nuffield project and books on advanced topics being studied by the tutors.
- 5) The tutors also attended the first demonstration class.

II. The spirit of the group, especially for the inspectors, markedly improved over last year. I would attribute this to three factors:

- 1) Better background because of the first Institute and the correspondence course; hence no longer so "afraid" of mathematics.
- 2) A more varied and interesting institute program.
- 3) The beginning of the Kenya modern primary mathematics program which made the practical value of the course more apparent.

III. Comments on parts of Institute Program in which I was involved.

- 1) Revision work: This seemed to be reasonably successful; certainly many difficulties were cleared up.
- 2) Demonstration classes: Very successful. The teachers we saw were

fairly competent but various parts of their presentation were faulty in one respect or another. Also, in two of the classes, I tried number games with the children with failure in one case (language difficulty) and partial success in the other. Considerable discussion followed each lesson (of about 40 minutes) in regard to good and bad points of the lesson.

- 3) Mathematics lectures for tutors: Both Dr. Jacobsen and I agree that you couldn't ask for more interested and attentive students (with two or three exceptions). We gave them regular homework assignments which most did with enthusiasm. The results of the final examination (attached), however, were disappointing with the highest grade 85 and the lowest 25 (median = mean = 61). The revision problems (1,2 and 5) were handled well by the returning students but frequently missed by the new students; both old and new did poorly on the calculus and probability problems. Especially disappointing was the lack of even attempts to do problem 6 since the course stressed, in the afternoon session, discovery approaches to mathematics. (The examination was given in the second period of the last day.)
- 4) Teaching of Standard 1 - 6: I sat in on some of these sessions and contributed a few remarks. These sessions seemed to be useful and well-received.
- 5) Teaching of In-service courses: I handled the first session by making some general observations. These sessions also seemed to be useful and well received.
- 6) Teaching in the TTC (evening sessions): These did not go over well. Participants didn't want to get down to specifics and wanted to spend time complaining about lack of texts, Ministry policies, etc.
- 7) Primary School activities: These sessions seemed to be enjoyed by the participants but it was extremely difficult to get any activity from the inspectors. I showed them many games, puzzles and other activities and, when the level was suitable, tried to get them to participate. Also assigned problems for investigation with, again, little activity from the inspectors and not too much from most of the tutors.
- 8) Library: This seemed to have been used a fair amount by the tutors but very little by the inspectors.

IV. Outstanding participants among the tutors, both in interest and ability, were Sushila Bakda, Francis Githira (great improvement over last year), David Mwangi (top of list academically both years), Mrs. S. Nderitu (not in first year course), and John Okoth.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

Report on Mathematics Institute
Held in Kenya, December 5-17, 1971

by

John Fitzgerald, Maths Educator

1. The second of two institutes for Kenya was held at Kenya High School which again proved a most satisfactory centre for accomodation, food and facilities.
2. Participation - see attached list.

The following 1970 participants were not present:

S.N. Nguthari, G. Kiambi, D. Muhindi, J. Mwai (all college Tutors who have left teacher training).

Sister Regina, Bro. Leo, Sr. Kathleen, Mrs. N. Onyango, P. Lavin - expatriate tutors either on leave or not in college any more. B.D. Odhiambo (promoted to H.Q. Inspectorate) S. Abeid (on leave) C.R. Onyango (ill).

New entrants were Sr. Kathleen, Mrs. N. Onyango, B. Odhiambo, J. Shihundu (from the 4 colleges not represented in 1970) G.O. Ogola, Mrs. Nderitu, J. Peaks, S. Kibuku (replacing previous participants from their colleges) and F. Kaumbutho, J. Mote; S. Thoya, S. Warsame (inspectors representing districts not represented in 1970).

However it was soon evident that the 1971 participants formed a much more satisfactory and improved group than it was in the previous year. Most new entrants were real assets and previous participants were also much more interested. Reasons for increased interest and enthusiasm appeared to be the following:

- a) Now that modern mathematics has arrived in primary schools all participants, from their workaday experience during 1971, see that a job is to be done and is being done. In 1970 it was still theoretical, the EARMP programme was new and so interest was not always fully awakened.
- b) Assistance already received through 1970 Institute, correspondence studies and Maths Educator's visits had been realised as being of vital importance to their professional needs.
- c) The more practical slant we gave to the 1971 Institute.

3. The Programme

The programme followed pretty closely the tentative schedule planned by Professor Dubisch and myself after a good deal of observation and experience in colleges and primary schools classrooms. My comments on the various aspects are:

a) Revision of last year's work

This proved to be not only necessary but very valuable especially for new entrants, both tutors and inspectors.

b) Checking over last year's correspondence courses

This enabled the clearing up of many difficulties. The three sessions were conducted in group with a college Tutor assisting a small group of inspectors.

c) Demonstration classes

This was an experiment this year and proved so popular and valuable that we hope to include this activity in future institutes. Tutors also asked to come to the Standard I demonstration. On the second and third days demonstrations were given in Standard 2 and Standard 4 classes. There was thus a mixture of modern and traditional mathematics teaching and materials and much was learned by observation and the discussions which followed.

d) Sessions on Teaching - Standards 1 to 6

Although the Kenya Primary Mathematics books are available for Standard 1 and 2 only so far we used the ENTEBBE books 3, 4, 5, and 6 for the later sessions. Inspectors expressed great interest because they had not yet seen the sort of materials that are likely to be prepared for the upper primary grades. Many new ideas and approaches, even if applied to the existing upper-primary traditional classes, were picked up by inspectors during these sessions.

4. In-Service Courses (Inspectors)

Attention was drawn to the guidelines courses which I previously conducted in the provinces. New ideas on procedures were exchanged among inspectors from districts which varied with respect to size, remoteness, population (both in numbers and ethnic distribution, types of schools, rural and urban and so on). (See attached list of Provinces, Districts and Schools).

The greatest immediate need is for more in-servicing courses for non-EARMP inspectors and assistants because they have to do the same job of in-servicing and supervising an increasing number of primary school teachers.

5. Primary School Activities

These were conducted by Professor Dubisch and will be commented on by him.

6. Other lectures on Mathematics topics

- a) Tutors - Dr. Jacobsen, a UNESCO appointee at Department of Mathematics, University of Nairobi, on Probability and Statistics, and Calculus. Prof. Dubisch lectured on Number Theory. Although I was not able to be present at these lectures the comments I heard from tutors certainly indicated a tremendous interest on their part.

b) Inspectors

Additional lectures in two evening sessions (not shown on the schedule) were given by me on Clock Arithmetic, and the general structure of the Real Number System. Both emphasized those properties of operations which had been too lightly touched on in 1970 and which are of great importance in primary school work.

CONCLUSION:- I would say that the 1971 Kenya Institute was most encouraging for the future. Participants were keener and appreciated the balance which was struck between the academic and the practical. They appreciated both the academic and the practical and I believe they would be put out if either were neglected on any future institute.

KENYA

NUMBER OF PRIMARY SCHOOLS IN EACH DISTRICT

No.	Province	District	No. of Divisions	Names of Inspectors	No. of Schools	No. of Inspectors
1	CENTRAL	Kiambu	8	<u>J. Ndinika</u>	300	1 PSI
2	"	Kirinyaga	3	<u>B. Memon</u> , Ngeru <u>J.M. Gitemi</u>	125	2 APSI 1 PSI
3	"	Muranga	5	S.N. Mukuria <u>R.N. Kinyanjui</u> <u>J.W. Nderitu</u>	300	1 APSI 2 PSI 1 APSI
4	"	Nyandarua	4	J. Nganga <u>N. Munyanjua</u>	110	2 APSI
5	"	Nyeri	6		220	2 PSI
6	COAST	Kilifi	4	<u>S.J. Thoya</u>	151	1 APSI 1 PSI
7	"	Kwale	3	F.M. Kaloe	114	1 PSI
8	"	Lamu	2	K.M.O. Mazrui	12	1 PSI
9	"	Mombasa	1	<u>S. Chibudu</u>	50	1 PSI 1 APSI
10	"	Taita	3	<u>S.O. Abeid</u> A.B. Musanye	90	1 PSI 1 APSI
11	"	Tanga	2	H. Wissumi	50	1 APSI
12	EASTERN	Embu	3	<u>F. Kamubutho</u>	140	1 PSI 3 AEO/PSI
13	"	Kitui	5	<u>S. Muene</u>	240	1 PSI 5 AEO/PSI
14	"	Machakos	8	J.K. Njoroge <u>H. Muthania</u> Z. Muriu S. Munyi	672	3 PSI 1 APSI 7 AEO/PSI
15	"	Meru	7	<u>E. Mwangi</u>	430	1 PSI 1 APSI
16	NORTH EASTERN	Garissa	6	<u>S.A. Warsame</u>		1 APSI
17	"	Mandera	3		32	
18	"	Wajir	6	A. Bakorda		1 APSI
19	NYANZA	Kisii	9	<u>S. Dulo</u>	523	1 PSI
20	"	Kisumu	4	<u>A.A. Ater Odundo</u> A.A. Ouma	200	1 PSI 1 APSI
21	"	Siaya	4	<u>J.R. Oyugi</u>	227	1 PSI
22	"	South Nyanza	8	<u>D.O. Ongile</u>	412	1 APSI 1 PSI 2 APSI

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM
REPORT

of the

THIRD INSTITUTE FOR TEACHER TRAINING INSTITUTE
TEACHERS AND SUPERVISORS

Prepared by: Mr. D.A. Brown

Location: Ramseyer Training Centre, Abetifi, Ghana
Date: December 9-23, 1971

a) Opening

The opening ceremony was performed by Dr. E. Evans-Anfom, Vice-Chancellor, University of Science and Technology, Kumasi. A copy of his address is appended.

b) Purpose

1. To familiarize the tutors with the mathematical content of the new teacher-training college texts prepared by the July/August 1971 workshop.
2. To give the tutors a clear understanding of how the mathematics and methods of the teacher-training college relate to the mathematics and methods of the primary school.
3. To have the tutors devise problems and activities which will facilitate the learning of the mathematical content of the teacher-training college texts.

c) Participants

A total of 56 tutors were invited from 25 teacher-training colleges in the Eastern and Volta Regions and the Accra Administrative Area. Of this number 45 were participants in the First Institute held in December 1971 or had been recruited in 1971 and had also participated in the Correspondence Course. The remaining eleven including two women had been recruited about the beginning of the 1971-72 school year. Of this number 47 turned up including three women.

d) Staffing

Mr. Jack Alexander and Mr. John Norris, WARMP Maths Educators, both of whom helped prepare the teacher-training college texts taught the maths content of classes.

Mr. Seth Minta of the Ministry of Education, Saltpond and Mr. Andrew Nyame, Maths Organizer, also of the Ministry of Education, both of whom

helped prepare the new primary school texts related the content at the teacher-training level to the work at the primary school.

Dr. Robert Yawin and Mr. Jack Williamson, both of the Curriculum Research Development Unit, Accra, assisted the tutors in developing the activities and problems which can be used to facilitate the learning of modern concepts and teaching methods in the teacher-training colleges.

Mr. Dogbe (CRDU) and Mr. Hartman, WARMP Editor, involved themselves with every class and tried to obtain editorial suggestions from every available source.

e) Class Structure

The participants were split into two classes of roughly 24 each. Each class went through the same six-hour cycle of lessons based on each chapter of the teacher-training text. First, the mathematical content of the chapter was looked at; then how this content should be related to the primary schools both in terms of concepts and methods of teaching and thirdly, problems and activities were devised which would facilitate the learning of modern concepts and methods by training college students.

The daily program was as follows:

Classes 1	7:00 am - 9:00 am
Breakfast	9:00 am - 9:30 am
Classes 2	9:30 am - 11:15 am
Tea	11:15 am - 11:30 am
Classes 3	11:30 am - 1:30 pm
Lunch	1:30 pm
BREAK	
Dinner	6:30 pm

f) Evening Activities 7:30 pm - 8:30 pm

Friday Dec. 10	Talk: Why Chapter One? Mr. Alexander
Sat. Dec. 11	Films
Sunday Dec. 12	Service
Monday Dec. 13	Talk: Count Buffon, Mr. Alexander
Tue. Dec. 14	Square Roots: Mr. Norris
Wed. Dec. 15	Films
Thurs. Dec. 16	Exploration in Maths: Mr. Alexander
Fri. Dec. 17	Free
Sat. Dec. 18	Films
Sun. Dec. 19	Service
Mon. Dec. 20	Observations: Messrs. Minta and Nyame
Tue. Dec. 21	Rev. Ramseyer and the Centre: Rev. B. Bassi and Rev. I.H. Frempong

g) Accommodations

Participants were accommodated two to a room at the Ramseyer Centre. Three of the staff, the Administrator and Messrs. Minta and Nyame, stayed in the same building. The other members of the staff stayed in rented rooms close to the Centre.

h) Water

Running water was available at the centre and at one of the rented houses but only for the first week of the Institute. Thereafter both participants and staff at the centre had to fetch water for baths from underground storage tanks some distance away. The majority of participants and staff had worked under very much better conditions at the Advanced Teacher Training College, Winneba, at the First Institute in December, 1970. The conditions at the Ramseyer Centre therefore caused some complaints. Fortunately however there was no eruption. Staff in rented rooms were provided with bath water by their landladies.

The University of Science and Technology, Kumasi offered to house the Institute but a charge of N05.00 per head per day which was a cedi higher per head per day than our budget could bear. Other available locations with better facilities could not be used for reasons of cost.

i) Board

The feeding was not satisfactory; the cooking was not of the best quality and there was too little variety. There were complaints by participants and the course leader Mr. Nyinaky mentioned this tactfully in his speech at the end of course dinner.

j) Health

Seven participants were seen at Atibie SDA Hospital for various complaints and one of them with an eye complaint was sent to the Eye Doctor at Agoogo some 40 miles away.

k) Recreation

Apart from Film shows on three evenings groups of participants visited places of interest on the Kwahu scarp. There were two excursions, one to Port Adawso on the Volta Lake, and the other to Kumasi in Ashanti.

Indoor games, Ludo, Draughts and Snakes and Ladders were provided and used.

l) Transportation

Transportation was provided free of charge by educational institutions on the Kwahu scarp as follows:

Buses for visit to Port Adawso: Abetifi Training College
Mpraeso Secondary School

Buses to convey participants
from Nkawkaw to Abetifi on
December 9 and from Abetifi to
Nkawkaw on December 22:

Nkawkaw Training College
Abetifi Training College
Mpraeso Secondary School

Buses for visit to Kumasi:

Abetifi Training College
Nkwatia Training College

m) General Comments

Dr. Bernard Shapiro, WARMP Consultant Evaluator and Dr. D.K. Abbiw-Jackson (African Maths Program) of the University of Science and Technology, Kumasi, visited and worked with the Institute.

In terms of the amount of ground covered, useful work done by participants and the extent of co-operation by schools and colleges this was the most successful institute held so far. Also, participation in after-class activities was excellent.

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

THIRD INSTITUTE

Ramseyer Training Center, Abetifi, Ghana

Participant List

1. Nyinaku, G.K.	Mount Mary Training College
2. Takpo, J.N.	Bueman Secondary School
3. Ameyaw, J.O.	Aburi Meth. Training College
4. Ampofoh, H.O.	Adukrom Training College
5. Odoom, D.N.	Presby Training College, Akropong
6. Lomotey, G.M.	Mount Mary Training College
7. Asare, E.L.	Mount Mary Training College
8. Osei, M.M.	Anum Training College
9. Annan, E.N.Y.	Accra Training College
10. Shardow, A.	Aburi Meth. Training
11. Kissiedu, W.N.	Krobo Training College
12. Agbo, W.K.	Peki Training College
13. Doe, A.Y.	Peki Training College
14. Dzakpata, B.N.	Ada Training College
15. Asantey, E.K.	Jasikan Training College
16. Yaya, O.K.	" " "
17. Asare, C.W.K.	" " "
18. Djamboe, P.C.	" " "
19. Agbenku, T.G.B.K.	" " "
20. Aggor, Victoria	" " "
21. Dor, E.D.	S.D.A. Training College
22. Mensah, M.E.K.	" " "
23. Addo, B.K.	Abetifi Training College
24. Dame, Paul	Juabeng Training College
25. Kissiedu, C.N.	Aburi Women's Training College
26. Otteng, Jacob	Nkwatia Training College
27. Obuobi, G.D.	" " "
28. Gaisie, M.C.	Begoro Training College
29. Djang, S.K.	Tafo Training College
30. Atitsogbi, E.B.K.	St. Francis Training College
31. Geraldo de-Lima, O.K.F.	St. Theresa's Training College
32. Gamedoagboa, E.K.	Akatsi Training College
33. Aych, T.A.	Obo Training College
34. Akude, S.W.J.	Akatsi Training College
35. Agyei, E.B.	Kibi Men's Training College
36. Boateng, S.G.	Akropong Training College
37. Ansanyi, G.K.	Abetifi Training College
38. Ennin, J.K.	St. Theresa's Training College
39. Mensah, D.T.	Accra Training College
40. Ayensu, F.K.	Aburi Meth. Training College
41. Akabua, P.K.	St. Francis Training College
42. Alobuia, A.	Akatsi Training College
43. Gyan-Mante, F.V.	Presby Women's Training, Aburi
44. Koranteng, C.N.	Presby Training College, Akropong
45. Aninagyei-Bonsu, B.	Presby Women's Training College, Aburi
46. Laryea, V.A.	" " " " "
47. Jamboe, H.A.K.	St. Theresa's Training College
48. Pinamang, A.A.	Kibi Men's Training College

OPENING ADDRESS BY DR. E. EVANS-ANFOM,
VICE-CHANCELLOR, UNIVERSITY OF SCIENCE AND TECHNOLOGY
AT THE WEST AFRICAN REGIONAL MATHEMATICS PROGRAMME SEMINAR, ABETIFI
DECEMBER 9th, 1971

Mr. Chairman, Distinguished Guests, Ladies and Gentlemen:

I am grateful to the organizers for doing me the honour of inviting me to open this most important Seminar. The Seminar is important because of the significant role that Mathematics plays in our lives. All our waking hours are taken up with some aspect of Mathematics. When we count the minutes, the hours, the days, the weeks, the months and the years, when we measure the distances over which we travel, when we weigh the goods we buy, we concern ourselves with some aspect of Mathematics. Indeed there is hardly any sphere of human activity in which there is no Mathematics involved. Mathematics is the queen as well as the servant of all the other sciences. According to Hume, it is ONLY Mathematics of all the Sciences, which may be "admitted to the status of a rational science capable of demonstrating its conclusions with certainty." It is able to assert with dogmatic authority that there are some problems which can never be solved e.g. "squaring the circle".

Mathematics helps us to think clearly and logically because of the discipline it imposes on the mind. In its application it is vital to human progress in all areas. It is the common underlying ingredient in space travel, computer science, economic and industrial planning, electronics and telecommunication (the technological basis of the information media).

We live in an age of science and technology and no nation which desires to develop rapidly can do without these tools. Developing countries in particular require to use science and technology judiciously to help them to bridge the wide gap between themselves and the more developed nations. They have to do within a few decades what it took other countries centuries to achieve. Whereas initially a developing country has to rely on imported technical manpower, the surest way of achieving quick scientific and technological success is to develop her own human resources. Hence, the vital need for the training of scientists and technologists.

Mathematics is the acknowledged key for opening the doors to scientific knowledge. A knowledge of Mathematics is essential to a proper understanding of the other sciences, both Physical and Natural. The chemist, the physicist, the biologist, the biochemist - all need Mathematics as do the engineer, the architect, the doctor, the pharmacist, the agriculturist, the geologist, the economist and other nation builders. A developing country needs machines and tools, roads, buildings, hospitals, factories, farms, and transport systems. It needs technologists to plan and provide these and an army of technicians to maintain and to keep them functioning. All these need Mathematics.

It is well-known that one of the greatest shortcomings of pre-university education in developing countries is the weak scientific background of the pupils in primary and secondary schools because of the poor teaching of science. This, in turn can be traced to the shortage of well-trained science teachers, and the poor teaching of Mathematics. Mathematics is the dreaded subject at all levels of education in our West African countries. Children who are good in other subjects often do badly in Mathematics. Indeed, the proportion of pupils who distinguish themselves in this subject is disappointingly low. I am sure many of us here, today, look upon our Mathematics lessons at school as ordeals.

It became clear over the years that there was something radically wrong with the teaching of the subject itself. It was vital that a new approach for teaching the subject should be found. There was a crying need for "Mathematics without tears". I am told that the Modern Mathematics takes care of the underlying reasons for this. It replaces the blind, mechanical and laborious operation of the Mathematics lessons of our time with a meaningful approach to the subject based on reasoning and a method of enquiry and sound judgment.

If any tears are shed now by any pupil under the New Mathematics Program, they must be tears of joy on discovering the ease with which apparently difficult problems may be solved. I know, of course, that some parents in their turn have started to shed tears over this for they are no longer able to assist their children with their homework because of this new method which they cannot understand. In some places in the U.S.A., evening classes are organized for parents to help them understand the new method! This enables them to help their children with their homework.

I am told that for the past four years or so, efforts have been made to introduce the New Mathematics in our primary schools but that the main problem has been the lack of teachers adequately trained to teach the subject. Bold and serious efforts have been made to solve this problem and to facilitate the introduction of the new method into our schools. It is clear, however, that this problem cannot be solved merely by the in-service training of primary school teachers. It requires a pre-service training of these teachers as well. It is therefore gratifying to note that the West African Regional Mathematics Programme has come in just at this time to train Mathematics tutors of our colleges, thereby providing the much-needed PRE-service training of our primary school teachers, the products of these colleges.

The purpose of the West African Regional Mathematics Programme is three-fold:

- a) to train enough mathematics tutors and school supervisors over the next four to five years to teach the new Mathematics in all primary teacher training colleges in the regions comprising Ghana, Liberia and Sierra Leone

- b) to produce textbooks in the new Mathematics suited to the primary, secondary and teacher training levels of education in the three countries. These textbooks will be superior in quality and cheaper than those currently in use in the schools.
- c) to train editors and evaluators in order to ensure that curriculum review, particularly in Mathematics will continue in the participating countries:

This is the Third Course to be run under the Programme and those of you who are participating have been specially selected by the Mathematics Educators of the Programme because of your special suitability.

Following the first workshop conducted at Fourah Bay College in July-August this year, material has been produced for the first two years for the primary, secondary and teacher training courses. This material is being trial-tested in schools and colleges and the feedback from these will be used for the final editing before publication.

This is the second and last briefing course for those of you who were recruited in December 1970 from the Volta Region, the Eastern Region and the Accra Administrative Area. Other recruits from the Central and Western Regions will attend their second and last course in January 1972. Assignments have already been written and printed for the second phase of the correspondence course and you will start receiving them almost immediately after this course (Institute). By October, 1972, the Programme will be able to certify many of you as adequately trained to teach any syllabus in the Modern Mathematics at a primary teacher training college. What is being done by the Programme in Southern Ghana will be repeated in Ashanti, Brong-Ahafo and the North in 1972-74. In a few years from now, everyone of you will have trained hundreds of primary school teachers in the Modern Mathematics and through them thousands of primary school pupils, some of whom will go on to secondary schools and universities. You can therefore look upon yourselves as a "chosen band of revolutionaries". The revolution which you will lead will be silent and yet it will have far-reaching effects on the scientific, technological and ultimately economic development of our countries. Besides the purely educational, the work of the West African Regional Mathematics Programme has social, economic and political merits. Without doubt, the most beneficial aid which a developing country may receive is that which is geared toward improving the quality of education, as well as spreading its benefits. Its impact is not as dramatic as gifts of food or other material things but in the final analysis it turns out to be greater because it is the educated who play the leading role in the development of the country.

Like the West African Examinations Council, the West African Regional Mathematics Programme, brings together several countries in West Africa in one profitable endeavour. We are practising regional cooperation instead of merely paying lip-service to it. It is ironical that during

the colonial days there was more cooperation between West African countries than there is now. With the coming of Independence the few bonds of cooperation, uniting our countries were dissolved by the strong fires of nationalism. It is therefore pleasing to note that we are once again coming together and that almost every day we read in the newspapers efforts being made by our leaders towards social, economic and cultural cooperation. It is a special pleasure for me to welcome our friends from Liberia and Sierra Leone to this course. I hope that they will enjoy every moment of their stay in this historic and picturesque town of Abetifi. I hope, also, that they will manage to see something of the rest of the country and that they will go back with pleasant memories of their stay in Ghana.

And now, Mr. Chairman, Distinguished Guests, Ladies and Gentlemen, I have great pleasure in declaring your seminar open, and in wishing you all success in your deliberations here.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM
REPORT

of the

FOURTH INSTITUTE FOR TEACHER TRAINING INSTITUTE
TEACHERS AND SUPERVISORS

Prepared by: Mr. Makonnen Eunatu

Location: Junior Teacher Training College, Addis Ababa
Date: January 3-18, 1972

PREPARATION

a) Site

We had the following minor complaints about the location of the last Institute:

- (i) The place was noisy since students were practicing on various musical instruments.
- (ii) The rooms were too sunny and too hot specially during the afternoon.
- (iii) Some participants complained that there were not adequate lodging facilities near the school and they had to spend more on transportation.
- (iv) The school authorities were not too happy of our request of more rooms for group sessions.

In light of this experience other possibilities were explored. The YMCA was approached but their charges both for lodging and food was too high. Besides they could not accomodate so many participants.

The Junior Teacher Training College was approached for classroom facilities and they were willing to provide such facilities for one week from January 3-9, 1972, after which they had to resume school activities. Fortunately the Technical School which is in the same campus was closing on January 10, 1972 and they were willing to provide us with similar facilities for the rest of the Institute. The Ministry of Education, therefore, wrote to the Principals of both Institutions authorizing to provide the required and available facilities for our Institute.

Morning break coffee/tea was provided by the college staff club at Eth. \$ 0.15 per cup.

b) Invitations

An invitation for participants was forwarded to the Ethiopian Ministry of Education together with a list of last year participants indicating those who had attempted correspondence assignments and those who had not tried at all. The Ministry was also advised to invite new teacher training teachers and new supervisors who had some experience in modern maths should it decide to exclude participants from last year. Due to lack of availability of residence facilities the Ministry was informed that participants would be paid daily allowances of Eth. \$10.00 for Teacher Training Teachers, Eth. \$7.00 for Provincial Supervisors, and Eth. \$2.00 for Addis Ababa participants (TTI teachers and supervisors).

The Ministry invited about 60 participants excluding those who had not attempted any correspondence assignments and including the new TTI teachers. Only one new supervisor was invited.

An evaluation questionnaire was sent with the invitation.

c) Time Table

A tentative schedule was prepared and sent to participants with the invitation. . . . We were later informed by the Ministry that TTI Teachers were invited at the time of the Institute to discuss the syllabus for Primary Schools. The maths syllabus discussions had, therefore, to be coordinated with our Institute Programme. Some of the guest lectures of the Institute had, therefore, to be abandoned and devoted to maths syllabus discussions. Professor Roy Dubisch played an active part in the discussion and preparation of the syllabus.

With the exception of the above changes the tentative schedule was followed as laid down.

d) Other Arrangements

H. E. Ato Paulos Asrat, Vice Minister of Education Instruction, was approached and requested to open the Institute. Glad as he was to do so he had to go out of town for another important educational duty on the opening date. He, however, recommended Dr. Ayalew G. Selassie, General Manager of Curriculum and Mass Media, to open the Institute. Dr. Ayalew kindly consented to open the Institute.

Past experience had shown that the press had no keen interest to cover our activities. The Public Relations Office of the Ministry of Education was therefore contacted and informed of program activities and of the Institute in particular. The Director General of the Ministry Public Relations Office invited press people to cover the opening session.

Dr. Abye Kifle of Maths Department of HSI University was asked to lecture but since he was going out of the country for a conference, Ato Yohannes Menkir was asked and was willing to do so. Dr. Abye later

reported that his conference was off and that he was willing to give lectures. But by then arrangements were made with Ato Yohannes.

a) Lecturers

Professor Roy Dubisch: Maths Editor/Educator, EARMP

Mr. John Fitzgerald: Maths Educator, EARMP

Ato Yohannes Menkir: HSI University, Science Faculty, Guest Lecturer

Ato Girma Mengistu: Head of Math Department, Ministry of Education, lectured on the Primary I Book

b) Administration

Ato Makonnen Eunatu: Program Administrator, EARMP

Woizero Egigayehu Haile: Secretary, EARMP

THE INSTITUTE

a) Opening

On the morning of January 3, 1972 most of the participants were present at the Junior College.

Dr. Ayalew G. Selassie, General Manager of Curriculum and Mass Media, Ato Getachew Mekuria, Chief Expert of Teacher Education, Ato Kebede Fire Senbet, Head of Curriculum and other Ministry personnel as well as Dr. Bernard Shapiro, Consultant Evaluator of the Program, were present at the opening session.

Dr. Ayalew addressed the group and outlined the purpose of the program and of the Institute in particular. He said that the purpose of the program is to reform and upgrade the teaching of mathematics through Institutes and Workshops where Teacher Training Teachers and Supervisors would exchange experiences and disseminate new ideas of teaching. Underlying modern maths are fundamental matters such as the structure of maths as a discipline, the cognitive development of individuals and the structure of the cognitive patterns which are brought to the learning through interaction. The big job is to break tradition which has been 'talk and chalk' and to encourage interaction. The real work of the classroom is to be an observer of how concepts are brought into the cognitive power of the individual learner. He then declared the Institute open.

Ato Getachew Mekuria also addressed the group briefly and wished the participants good luck.

Professor Roy Dubisch made an introductory address after which our guests left and normal Institute activities were carried on. (See Educators report, part II and III).

Just after our guests left the press people came in, took pictures and interviewed the Administrator. On the next morning there was an article on the Institute on the front page of the leading Amharic Paper, Addis Zemen (New Times). (Annex iii)

b) Participants

Out of 60 participants invited by the Ministry 51 came for the Institute. Twelve of these were TTI Teachers and 39 were Primary School supervisors. Half of the TTI Teachers were expatriates and half nationals. All the supervisors were nationals.

Three of last year's Institute participants (one expatriate and two nationals) had left but were replaced by four new ones, all nationals. Out of the 43 invited supervisors five did not come but one of them was replaced by a newcomer. All TTIs and all Provinces but one, Kaffa, were represented at the Institute. All participants but one completed the Institute. Ato Mohamed Saed Abdulkadir, a supervisor from Asmara, left after one week because of his daughter's sickness.

c) Books and Other Materials

New participants who were not in possession of books distributed last year (Basic Concepts 1, 2, & 3, Handbook for Primary Teachers, Guide to the Primary Books and Mathematics Syllabus Source Book) were given copies.

One copy of the trial edition of Fundamental Concepts of Mathematics for Primary School Teachers was distributed to each participant after approval was obtained from Mr. John Joanou, Director, African Mathematics Program. According to his instructions, "Trial Edition" was stamped on the cover page in bold letters. All Kenyan participants will now also have a copy each.

d) Other Activities

For complete subject matter coverage Ref. to Maths Educators Reports, parts II and III.

- (i) Demonstration classes: Ato Girma Mengistu kindly arranged for Primary 1, 2, 3 grade pupils and teachers from Dejazmatch Baltcha Primary School. The teachers and pupils actually came to the college and showed demonstration classes.
- (ii) Evaluation: A test was given to the TTI teachers by Professor Roy Dubisch and WEAMP/TB/I Specimen Paper was given to the supervisors.

Dr. Bernard Shapiro, the Consultant Evaluator, was at the Institute from January 3-6, 1972, and discussed evaluation topics with the Administrator, the Maths Educators, the Trainee Evaluators, the TTI Teachers using the Trial Edition Text and with the Management Committee. He expects the Trainee Evaluators to obtain feedback from Program activities, analyse it, and forward the results to him through the Administrator.

An Evaluation Questionnaire was sent to the Ethiopian participants together with the Tentative Schedule to be filled up and sent back to the Administrator. Only nineteen of the participants responded to the request before and during the Institute. The attempted analysis seems to show that the Institute, Correspondence Courses, and the Visits of the Educators are close to each other in popularity unlike the responses of the Kenyan participants.

Active participation in in-service courses is less than expected and consequently the number of teachers in-serviced is not as impressive as the Kenyan number although this number may be greater since some respondents did not give figures.

Again, problems encountered at the in-service courses as well as other suggestions given by participants are fragmental and dissimilar from one another. (Annexes Va and Vb)

- (iii) Correspondence Assignments: Only three of the TTI Teachers have done four assignments which were the only ones prepared for them. All three are expatriates and from the same TTI, Jimma, and all have the same grades. The rest of the TTI Teachers have not attempted any assignment.

One of the supervisors has completed all the 19 assignments, 15 of which were prepared for supervisors and four for TTI Teachers. Two have done 18 assignments and two have done 17 assignments while one Model School Teacher has done 16. On the whole 20 of them have done more than half of the assignments and 33 of them have done more than 25% of the assignments while nine have done less than 25%. Thirteen of the supervisors have not attempted any assignment and all of these have been excluded from the present Institute.

The standard of grades has, however, no correlation with the number of assignments done. Some of the supervisors who have done fewer assignments have better grades than those who have done more. This shows, therefore, that those who have done fewer assignments are not necessarily weaker than those who have done more.

On the whole the grades show a promising performance with many As and Bs and much less Cs and Ds and no Fs. Their failure to do as many assignments as required can, therefore, be attributed to other factors such as lack of time and poor postal services of which they have frequently complained.

All supervisors were given ten newly prepared assignments before their departure. These assignments have been prepared by Professor Roy Dubisch.

- (iv) Management Committee Meeting: The Management Committee met at the Ministry of Education on January 6, 1972, for a full day session.

Mr. G. Kimote stayed from January 3-9 and had the opportunity to see the Institute and discuss evaluation aspects with Dr. Shapiro.

The stay of the rest of the visiting members was brief. Professor Martin, Mr. Joanou and Professor Phythian arrived on January 5 and left on January 7. Mr. Isaac Hunja arrived on January 6 and left on the 8th.

e) Closing

The Institute closed on the afternoon of January 18, 1972, after refreshments at the Technical School Staff Room. Management Committee Members, Ministry officials and the Principals of the Junior Teacher Training College and the Technical School were invited. However, we had very few guests at the closing. On the other hand, two reporters, one from the Ethiopian Herald (Leading English daily paper), and one from Addis Zemen (Leading Amharic daily paper) appeared and had extensive informal discussions with the Administrator, the two Educators and Ato Girma Mengistu. On January 20th both papers had articles on the Introduction of Modern Maths on their front pages.

CONCLUDING REMARKS

The site has not been as satisfactory as expected. Many of the participants again complained that they could not find residence facilities nearby. Some of the Addis participants complained that it was too far from their homes and had to spend more for transport than what was paid to them. Some suggested that the market area was better to find hotels which to my opinion is not conducive for learning because of its noise and congestion.

Though the two Institutions (Junior College and the Technical School) offered us as many classrooms as we needed, none of them were safe enough for setting up an office or a small library such as the one we had in Nairobi.

Now that we have increased the dislocation allowance per diem of the TTI Teachers, the Supervisors (both Provincial and Addis) complained that theirs is not enough. They have of course been told that any further increase is out of the question.

The participants would have liked to discuss some of their urgent problems with Ministry officials. The officials too would have liked to do so but could not spare the time.

On the whole the participants continue to be interested in the program as a guide to their professional duties.

Makonnen Eunatu
EARMP Administrator

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

FOURTH INSTITUTE

Junior Teacher Training College, Addis Ababa
January 3-18, 1972

Participant List

Teacher Training Institute Teachers

1. Gebre Michael Abrha	Asmara
2. Gebre Yohannes G. Selassie	Debre Berhan
3. Ghermai Negash	Harar
4. Hadgu Baria Gabre	Debre Berhan
5. K.Q. Krishnan Nambiar	Asmara
6. Michael Zeri	Harar
7. M.J. Joseph	Debre Berhan
8. Nallian Jeyasingh	Jimma
9. Padamanabha Iyer	Jimma
10. Rebecca A. Haimantog	Jimma
11. Rasia Duraisingam	Jimma
12. Tadege Gebre Medhin	Addis Ababa

Supervisors

1. Abebe Worku	Gojam - Debre Marcos
2. Alemu Shehamet	Wollamo - Sodo
3. Ashagrie Tadesse	Gondar - Begemeder
4. Asmelash Belay	Ghimbi
5. Ayalew Hailu	Dessie - Wollo
6. Bekur Bogale	Addis Ababa School
7. Belihu Haile Masekel	Addis Ababa
8. Berhane Mengesha	Tigre - Shire
9. Boshera Tolesa	HSI Jun. Sec. School - Nekemti
10. Demissie Megria	Assela, Arussie
11. Fikre Teklu	Dire Dawa
12. Fisseha Mengesha	Dire Dawa
13. Girma Negussie	Addis Ababa School
14. Getahun Eshete	Assela - Arussie
15. Girma Bette	Awasa - Sidamo
16. Gebre Medhin Geleta	Shoa - Ghion
17. Haile Michael W. Mariam	Addis Ababa School
18. Hailu Abate	Addis Ababa School
19. Hailu Meheret	Illubabur - Bedelle
20. Kahale Wondaferew	Addis Ababa School
21. Kebede Admasu	Dodola, Bale
22. Kassa Zewdu	Debre Marcos - Gojam
23. Mohamed Saed Abdulkadir	Asmara
24. Mammo Terefe	Gomu Goffa
25. Makonnen G. Giorgis	Tigris - Mekele
26. Mohammed Yesuf	Dessie - Wollo
27. Mengesha Geleta	Harar
28. Negate Tamiru	Asmara - Eritrea
29. Negussie Nigatu	Shoa, Addis Ababa
30. Sime Bekele	Assela - Arussie

31. Syeum Yitayew
32. Shiferaw Habtemariam
33. Tekeste Tseggai
34. Tessema Gelan
35. Tesfaye W. Kirkos
36. Tegen Kinde
37. Wondayehu Kassa
38. Worku Tegbaru
39. Yayenishet W. Rufael

Horro Gudru - D.E.O.
Dessie - Wollo
Eritrea - Keren
Shoa Addis Ababa
Addis Ababa School N. Zone
Tigre - Enderta
Gondar - Begememder
Bechena - Gojam
Gondar - Begememder

TENTATIVE SCHEDULE FOR ETHIOPIA INSTITUTE FOR SUPERVISORS AND TTI TEACHERS, JANUARY 3-18, 1972

	9-10:30	11-12:30	3-4:30
Jan. 3	(S,T) Opening remarks by Ministry and Staff	(S) Revision of last year's work (F) (T) Revision of real numbers(D)	(S) Checking over last year's correspondence courses (D,F) (T) Assisting supervisors
Jan. 4	(S) Revision of last year's work (F) (T) Real numbers continued; complex numbers (D)		do.
Jan. 5	(S) Teaching of Grade 1 (F) (T) Fields and rings (D)	(S,T) Demonstration class	do.
Jan. 6	(S) Teaching of Grade 2 (F) (T) Functions (D)	(S,T) Demonstration class	(S,T) Primary school activities (D)
Jan. 10	(S) Teaching of Grade 3 (F) (T) Groups (D)	(S,T) Demonstration class	(S,T) do.
Jan. 11	(S) Teaching of Grade 4 (F) (T) Groups (D)	(S) Teaching of In-service classes (D,F) (P) Guest lecturer	(S,T) do.
Jan. 12	(S) Teaching of Grade 5 (F) (T) Number theory (D)	do.	(S,T) do.
Jan. 13	(S) Teaching of Grade 6 (F) (T) Teaching in the TTI (D)	do.	(S,T) do.
Jan. 14	(S) Secondary school Maths (F) (T) Teaching in the TTI (D)	(S) Secondary school maths (F) (T) Guest lecturer	(S,T) do
Jan. 15	do.	do.	No class
Jan. 17	do.	do.	(S,T) Primary school activities
Jan. 18	(S,T) Revision of Institute work		Concluding remarks by staff and participants

- Notes: (1) S= Supervisors, T= TTI teachers, D= Dubisch, F = Fitzgerald
 (2) The guest lecturers will probably be University staff members
 (3) This year's institute will emphasize the problems of teaching rather than mathematics content. We hope to have considerable discussion of classroom problems both in the elementary school and in the TTI.
 (4) The schedule is definitely subject to alteration according to the needs and desires of the participants
 (5) Please bring your last year's correspondence lessons (complete or incomplete!) and Basic Concepts, Vol I-III. & other books given to you last year.

The Ethiopian Herald

MORNING NEWSPAPER

Addis Ababa - Thursday, January 20, 1972 - (Ter 11, 1964)

New Maths Teaching Being Introduced Here

A new method of teaching mathematics is being introduced in primary schools. A seminar on modern mathematics completed its work at the Technical School Tuesday after orienting primary school supervisors and mathematics teachers from the Teacher Training Institutes how best to implement the new techniques.

There were altogether 60 participants. Experts said that the new mathematics is useful for a country like Ethiopia which is undergoing drastic changes. It teaches children that they can discover things. It emphasizes on the participation of children rather than waiting for the teacher to tell them what to do and what not to do.

Similar techniques are being implemented in the teaching of science subjects. Teaching relies on demonstrations, and on learning through activity on the part of the pupils.

The provincial supervisors who were taught at the 15-day seminar will teach the mathematics teachers in the primary schools. Those from the TPI's will train the student teachers specializing in mathematics.

Modern mathematics is being implemented throughout East Africa. Mathematics teaching has been adapted to needs of the region. In Ethiopia, it has been introduced on an experimental basis in secondary schools, i.e. from grades 9 to 12.

The reason it was introduced at the secondary school before the primary school level is because of the problems involved in training teachers at lower grades. Experts said that the teachers to be trained at primary level is so vast, that it became necessary to implement the new programme at the level of the secondary schools.

The experts are looking forward to better results at the primary schools. They said that it would be the best place to judge the experiment.

Modern mathematics was introduced in the secondary schools in 1967. It is advantageous for the children because they are always engaged in asking questions and finding the answers on their own.

Orientation for teachers occurs every year. Most of the provinces have been covered by the orientation programmes, according to experts.

THE SEMINAR IN THE TEACHING OF
MODERN MATHEMATICS UNDERWAY

From: Addis Zemen (Daily Newspaper), Addis Ababa
Front Page, January 4, 1972

(Translation)

In accordance with the steps adopted for the introduction of "Modern Mathematics" in the Ethiopian school system the second seminar for teachers began here yesterday.

The seminar was organized by the Education Instruction Teachers Education Division of the Ministry of Education and Fine Arts.

The purpose of the seminar is to acquaint elementary school teachers with modern mathematics and thereby spread the system in all the schools, the Ministry's Public Relations Office revealed.

The seminar participants total 60 in all and they were selected from all the five teachers training Institutes, from schools in the Governorates-General and Addis Ababa as well as supervisors. Also foreign nationals teaching in Ethiopian schools are attending the seminar.

The seminar will continue up to January 18, 1972. At the end of the seminar the educators will return to their respective destinations, where they will be taking up assignments in teaching aspirant teachers, while the supervisors will see to it that the system is put into practical application.

It is learned that satisfactory results were recorded from a similar seminar conducted last year. The system, which has taught to grade one elementary school children by those teachers who took part in the seminar is still holding good today, the news source disclosed.

Today the idea of teaching of modern mathematics is being employed in West Africa and East Africa in particular comprising of Ethiopia, Kenya, Uganda and Tanzania. The system is being widely used in Ethiopia and Kenya.

The USAID is extending the necessary financial assistance towards implementation of the system while technical assistance is provided by educators associated with the American Education Development Center.

The East African Regional Mathematics Programme (EARMP) was set up in 1970. The scheme is run on the basis of directives drawn up jointly by officials of the Ministries of Education of Ethiopia and Kenya.

This organization prepares programmes related to modern mathematics for teachers of Teacher Training Institutes and has already written a trial text book. Trial of the book in two teachers training institutes in Ethiopia is encouraging. The book will be put on trial in Kenya too beginning this month.

The three-week seminar was opened by Dr. Ayalew Gebre Selassie, Manager Curriculum and Education Media Department. The seminar is being chaired by Ato Makonnen Eunatu and speakers include both Ethiopian and foreign nationals.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

Report on Ethiopia Institute for Supervisors
and Teacher Training Institute Instructors
Held in Addis Ababa, January 3-18, 1972

by

Professor Roy Dubisch

LOCATION

Addis Ababa at Junior College January 3-6 (January 7 was Ethiopian Christmas) and at the Technical School (in the same compound) from January 10-18.

PROGRAMME

During the second week of the Institute, TTI instructors of all subjects were meeting at the Commercial School to discuss a curriculum for the TTI's. We released our Math instructors for the opening session of this conference on the morning of January 10 and for part of the closing sessions on the 14th. We also changed our programme so that the 9-10:30 sessions on January 11-13 and the 11-12:30 sessions on January 13 were devoted to making a draft of a new syllabus for mathematics in the TTI's. (We also met on this problem from 5-6:00 p.m. on January 12-13.)

The programme was then rearranged to cover all the topics listed on the attached programme by eliminating all the guest lectures except those on January 11 and 12.

Changes made in the schedule for supervisors were minor. For both groups, we gave evaluative tests on the afternoon of January 17.

STAFF

Regular instructors were Professor Dubisch and John Fitzgerald; Yohannes Menkir of Haile Selassie I University gave the guest lectures (one on Applications of Complex Numbers and one on Applications of Matrices); Girma Mengistu and Aberra Waqjirra of the Curriculum Department assisted in discussions of curriculum both with the supervisors and the TTI instructors. Ato Ayalew Gebre Sellassie, General Manager of the Curriculum Department opened the conference.

EVALUATION

The morale seemed quite good except during the last two days when many were anxious to get away in time for the big Timket holidays on January

20-21 (and travel for some would involve two to three days). (There were also the usual complaints about inadequate per diem.)

Unfortunately, I was not at the Ethiopian Institute last year so that I can't make any comparisons between 1971 and 1972. But, on the whole, the group compared favorably with the second year Kenya group.

1. Mathematical Lectures to TTI Instructors: I had expected, from reports, conversations, their indifference to the correspondence courses and the fact that they were math graduates, to get a much better response to this part of the programme. But they certainly seemed (on the whole) to be less interested than the Kenya TTC tutors and I found their math background (again, on the whole) to be surprisingly weak. For example, they seemed to know nothing about complex numbers so that on this topic and others, I had to lower the level I had planned. Also, the first day almost all appeared without any paper and just sat there obviously not intending to take any notes!

At the end of the course, I gave them an examination. Six of the ten questions were on material covered in class both in Kenya and in Ethiopia. The result on these questions were not as good as in Kenya with complete failure as in Kenya, on the discovery type question 5. In my rounds of the TTI's I had presented the Kenya Institute programme (which included lectures on probability and statistics) to the teachers. Unanimously they all said that probability and statistics wasn't needed; they all "had it" so I did not discuss these topics but put the two probability questions from the Kenya exam on the Ethiopian one. No one got 6a, two got 6b and 6c and only one got 7. (Some arrived at probabilities greater than 1!) The average score was only 38.

Clearly, much too much has been assumed as background for these students and, last year in particular, too much time was spent on "enrichment" rather than fundamentals. The correspondence course this year will, hopefully, remedy some of these deficiencies in background.

Only one student of Harar TTI really stood out in terms of mathematical ability.

2. Demonstration Classes: These were fairly successful. Quite good teaching in a first grade class (using the new book) and really awful teaching in a second grade class. (The TTI teachers agreed to skip the third grade demonstration.) Discussion was somewhat limited because of language difficulties for some of us.
3. Teaching in the TTI: This part of the programme was as explained earlier, devoted largely to the production of a draft of a syllabus. The main effort was on the first year's work and the syllabus there is essentially the Kenya P3 syllabus (on which Vol. I of Fundamental Concepts is based). So,

if this syllabus is approved, Fundamental Concepts, Vol. I, will certainly be a suitable text.

4. Primary school activities: These were considerably more successful, especially with the supervisors, than they were in Kenya. A lot of participation and discussion in class.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

Report on Mathematics Institute
Held in Addis Ababa, January 3-18, 1972

by

John Fitzgerald, Maths Educator

The second Ethiopian Mathematics Institute was held in the Junior Teacher College and the Technical School. The facilities of the latter were much more satisfactory and superior to those of the Teachers College or Music School.

PARTICIPATION

As seen on the lists, the participants were Maths Teachers from all Teacher Training Institutes and supervisors from all provinces except Kaffa. It is regrettable that no supervisor came from Kaffa. There were some changes in the Maths Teacher group. One expatriate and two Ethiopian participants of last year have left teacher training work and they were replaced by new graduates who have joined the teacher training institute since last year. This greater production of Ethiopian participants is a step in the right direction. However, the staffing of teacher training colleges will not be stabilized for some time, at least until the first output of the College of Pedagogy, and we can expect more changes of staff in the coming three to four years.

Not all the supervisors came again. The Ministry of Education omitted those participants of last year who had not done any correspondence assignments. The Addis Ababa group which was too large last year was reduced. The net effect was a more compact group of 39 supervisor participants instead of the 55 of last year which was too many. As in Kenya, the group was also more interested and this was largely because of the motivation rising from implementation in September 1971 of the new primary mathematics syllabus in Grade I of all schools in Ethiopia.

1972 INSTITUTE PROGRAMME

As seen on the printed programme, this Institute paid attention not only to mathematics but also to the teaching of mathematics. As well as revision periods of last year's material and sessions devoted to last year's correspondence assignments, the other sessions included:

1. The teaching of grades 1, 2, 3, 4, 5 and 6.
2. In-service courses for teachers.
3. Secondary school mathematics -- This provided the continuing mathematical link with the content of last year's

institute. Additional lectures were given to supervisors on:

- a. The irrational number system which, united with the study of the previous year, introduced the real number system.
- b. Clock arithmetic as likely to arise in the future primary syllabus and an introduction to modern arithmetic.
- c. A study of the properties of modular arithmetic and a comparison with those of the rationals.
- d. Rigid Motions - a treatment of reflections, rotations and translations more detailed than that introduced in 1971. This included some references to the properties of combination of rigid motions and how they compare with or differ from the properties of the rational.
- e. Vectors - in relation to translations of geometric figures and of movements of points and the number plane.
- f. The basic ideas of functions as introduced in future primary school programmes.

Other activities introduced this year (as in Kenya) were:

A. DEMONSTRATION CLASSES

Arrangements were made for groups of children to be taught by their teachers from Grades I, II and III of a nearby primary school. These three sessions proved to be most valuable because:

1. The Grade I class was working on the new (modern) syllabus while Grade II and III worked on the traditional syllabus.
2. There was no question that the teaching seen in Grade I was outstandingly better in every way.
3. The Grade I teacher used activity and discovery methods and a variety of teaching aids.
4. The Grade I children were obviously enjoying their lesson and what they were doing was meaningful to them.
5. Both Grade II and III lessons were exactly opposite to this in that there was hardly any activity on the childrens' part, but there was a lot of telling (actually lecturing) by the teacher.

In this respect, there was demonstrated a powerful case for the new approaches stressed in the modern syllabus now beginning from Grade I upwards.

B. ACTIVITIES SESSIONS AT THE INSTITUTE

These were conducted for the whole group--teacher training teachers and supervisors--by Professor Dubisch and will be mentioned in more detail by him. Their value lay in the putting before the participants for the first time many activities which could be meaningful for children in the development of their mathematical abilities. Most participants seemed to appreciate that such activities could and should play an important role in future teaching programmes.

C. CORRESPONDENCE STUDIES

Last year's assignments were worked through in groups with teacher training teachers acting as leaders.

Correspondence assignments for 1972 are being made more practical, especially for supervisors. The final of these were given out to participants for submission and correction by the Maths Educators. Additional questions arising out of these can be discussed also by the educators during their follow-up visiting programmes.

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM
REPORT

of the

FOURTH INSTITUTE FOR TEACHER TRAINING INSTITUTE
TEACHERS AND SUPERVISORS

Prepared by: Mr. D.A. Brown

Location: Booker Washington Institute, Kakata, Liberia

Date: January 10-23, 1972

a) Participants

All participants who were supposed to attend from Ghana turned up punctually on January 8. Of the twenty expected from Sierra Leone, sixteen turned up punctually. Of the remaining four one was bereaved, another was sitting an external examination, the third had entered a University and there was no communication from the fourth. Participation by Liberia was very poor. Of eighteen invited only one showed up punctually and only a total of nine turned up by the end of the Institute. A number of probable reasons were suggested namely:

- 1) letters of notification had not been received or had been received late
- 2) travel money had not been paid to them by the Department of Education, Monrovia
- 3) some may have taken up vacation jobs

Liberian participants confirmed that when they attended the institute at Port Loko, Sierra Leone in January 1971 they did so only after they had been paid an amount of \$39.00 each by the Department of Education. It was confirmed also that Mr. Bettie who had been invited to be an instructor at the Institute but had not turned up had in fact taken up a well-paid teaching job in Monrovia. The worst initial disappointment was the inability of the Secretary of Education to fulfil an official engagement to open the Institute. (Unfortunately, he had been taken ill quite suddenly and was hospitalized).

b) Program of Work

Group A were participants working in primary schools. The Group examined the new Primary 1 and 2 materials prepared at the July/August workshop. They were also taken through Chapter 3 (Geometry) of the teacher-training material.

Groups B & C who were Training College Tutors, were taken through all the 11 chapters of the nearly completed teacher-training college texts.

There were also five evening sessions on mathematical topics.

The daily program was as follows:

7:00 am - 9:00 am	Group A: Messrs. Minta and Nyame
" "	Group B: Mr. Norris and Dr. Ohuche
" "	Group C: Mr. Alexander
9:00 am - 9:30 am	Breakfast
9:30 am - 11:15 am	Group A: Messrs. Minta and Nyame
" "	Group B: Mr. Alexander
" "	Group C: Mr. Norris and Dr. Ohuche
11:15 am - 11:30 am	Tea Break
11:30 am - 1:30 pm	Group A split into three small groups under Messrs. Alexander, Norris and Dr. Ohuche
11:30 am - 1:30 pm	Group B: Mr. Minta
" "	Group C: Mr. Nyame
	1:30 pm Lunch
	6:30 pm Dinner

c) Evening Sessions

Wednesday Jan. 12: Mr. Roger Hartman
Thursday Jan. 13: Chapter 1, Mr. Alexander
Monday Jan. 17: Explorations, Mr. J. Norris
Tuesday Jan. 18: Films
Wednesday Jan. 19: Dr. Ohuche
Thursday Jan. 20: Explorations, Mr. Alexander

d) Board and Lodging

When the first group from Ghana arrived at Booker Washington Institute on Saturday, January 8, hardly any preparation had been made to house and feed them. The Principal and his Vice were attending a function in Monrovia in connection with the inauguration of the new Liberian President, the Honourable William R. Tolbert, Jr. This dampened the spirits of the the Ghanaians considerably. However, junior members of staff came to the rescue. The group was entertained to drinks at the Principal's house and within about three hours food was served and rooms were provided. As it turned out - contrary to expectation - the food throughout the whole period of the institute was better than at any of the earlier institutes. The rooms were adequate in number and were spacious.

e) Hospitality

None of the earlier institutes enjoyed similar hospitality as this one did from both official and private quarters. The Principal and staff were at great pains to make the participants feel comfortable and satisfied. The Booker Washington Institute held an end of Institute party and dance in honour of the participants. The Institute also provided transport free of charge to convey participants on excursions to Monrovia and Bong Mines and to convey participants from Kakata to the Airport to catch their planes back home. It also arranged a film show for participants. The group expressed their deep satisfaction and appreciation for the extent and quality of the services accorded them.

f) Health

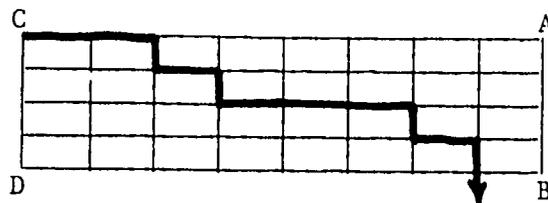
Apart from brief indisposition of one participant, Miss Hanson, there were practically no health complaints and no one had to see a doctor.

g) Observations

Although the material in the new teacher-training college text is not new to the participants they nevertheless had some difficulty with certain concepts, for example, the idea of large numbers as opposed to infinity still was not clear to some of the tutors. The concept of equality was even more troublesome. The idea that $X=Y$ is saying that X and Y are two names for the same thing was quite difficult for most of the group. Further, the whole idea of an axiomatic approach to mathematics was not fully appreciated.

It was observed that many of the participants were now willing to tackle open ended types of problems; they seemed more willing to explore and try to develop strategies for dealing with problems. This is a great change from a year ago when most participants shied away from problems like the following:

How many more paths can you find in the figure below that goes from CA to DB?



h) Conclusion

Groups B and C completed their assignments of examining the teacher-training texts and made many helpful suggestions for improvements. The staff also succeeded in correcting some of the weaknesses of the participants on basic concepts. Messrs. Seth Minta and Andrew Nyame of the Ministry of Education, Accra, provided a sound course in elementary mathematics methods for the Primary Group and Messrs. Alexander and Norris and Dr. Ohuche gave the Primary Group a pretty good treatment of Geometry.

On the whole the participants worked hard and got a great deal from the Institute. Almost everyone of them showed a definite improvement in maths ability. Some have benefited from the Correspondence Course, but the major difference is attitude. Most of them are now willing to at least try to deal with mathematical ideas. By the end of the two-year program they should be much better off mathematically.

D. A. Brown
Programme Administrator

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

FOURTH INSTITUTE

Booker Washington Institute, Kakata, Liberia

Participant List

GHANA

1. Arthur, G.F.K.	Komenda Training College
2. Quansah, I.B.	Holy Child Training College
3. Oguah, A.S.	St. Mary's Training College
4. Sagoe, Ekow	Winneba Training College
5. Miccah, W.C.	Ajumako Training College
6. Kumi, W.E.K.	Foso Training College
7. Kofie, T.B.K.	" " "
8. Agyei, Kodwo	Nsaba Training College
9. Asare-Afful, K.	Foso Training College
10. Badu-Prah, P.A.K.	Komenda Training College
11. Ampah, V.K.	St. Louis Training College
12. Sis. McDonald, Rita	Holy Child Training College
13. Abbiw, M.K.	Winneba Training College

SIERRA LEONE

1. Tucker, F.S.	Holy Primary School, Pujehun
2. Manu, J.P.	St. Anthony's Boys School
3. Kamara, A.M.	Our Lady of Fatima School, Makeni
4. Hanson, Rosaline	Catholic Training College, Bo
5. Bockarie, M.A.J.	Bo Teacher Training College
6. Kanu, E.S.	Catholic School, Lunsar
7. Ibrahim,	Port Loko Women's Training College
8. Dugba, T.M.	St. Augustine Training College
9. Macauley, E.A. (Mrs.)	Kissy Junior College
10. Taylor, Olivia E.	Tower Hill Mun. School
11. Aruna, T.B.	Catholic School, Kono
12. Cummings, M.	Siervice Children's School, Wilberforce
13. Tumaku, A.H.	St. Mary's Primary School
14. Harding, M.K.	St. Francis School, Bo
15. Spaine-Young, D.W.	Church of God School, Makeni
16. Gbondo, S.J.	Catholic School, Njala

LIBERIA

1. Snoh, T.B.	Kakata Rural Teacher Training Institute
2. Harvey, A.M.S.	Bassa Teenage School
3. Dennis, J.B.	Department of Education
4. Johnson, Claudius	St. Peter's Academy
5. Dogba, A.S.	Sanniquellie Central High
6. Cole, John	Bellefanai
7. Carver, Edwin	Sanniquellie Central High
8. Kimber, C.V.	M.C.S.S.
9. Kumar, B.	G.H.S. Cape Mount

4-Day Institute

Location: Department of Education
Monrovia, Liberia

Date: November 8 - 11, 1971

by

D.A. Brown
WARMP Administrator

Following the Management Committee decision of July 19, 1971 Dr. Banks Henries got together twenty-five participants and the Administrator agreed to organise an institute for them to be conducted by the Maths Educators from November 8 to November 11, 1971 in Monrovia. As may be seen from page one of the Green brochure prepared by Dr. Banks Henries one Supervisor and two teachers were to be invited from each of eight counties in Liberia in addition to six teachers from Montserrado County who, presumably were to assist with the instruction and to observe. However, the participants who turned up included only three school supervisors, the rest being primary and high school teachers.

The Institute dates coincided exactly with the visit of Mr. Edward Martin, Chief Education Officer, AID/Washington to Accra. The Administrator had to meet Mr. Martin in Accra on November 7, 1971. He was therefore unable to travel to Monrovia until November 8, 1971 and did not arrive in time to participate in the opening ceremony.

The Workshop got under way about 10:30 a.m. on Monday the 8th of November and ended Thursday 4:00 p.m. on the 11th. Of the expected twenty-five participants only twelve turned up on the first day. The number grew to twenty the next day; by the afternoon of the 9th we had a full complement.

Mr. Jack Alexander, Maths Educator gave a short account of the structure and history of mathematics. He explained the motivation of new innovations in mathematics education and mentioned some of the historical developments of the African Mathematics Program.

To begin the discussion of mathematics topics he asked participants to give the reason for the accepted procedure of division of fractions, i.e.

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} \quad \text{Why is this true?}$$

This worked out quite well. At first people were saying things like: "That's just something we accept," "It's a rule." "That's what the textbooks say." etc.

Before the first morning session ended, copies of the Entebbe Handbook for Primary Teachers were given out. Participants were asked to begin reading and it was suggested to them that material from these books would

be discussed in the afternoon. This set the stage for the format that was followed for the rest of the week. There was virtually no lecturing.

Each day the group met from 8:00 a.m. to 12:00 noon and 2:00 p.m. to 4:00 p.m. All of the work was, for the most part, done in small groups (two to three people). The Maths Educators went round and helped the participants when they encountered difficulties. They were also able to identify some advanced participants who were asked to be group leaders. These leaders were all quite good and with further training could be used to train other teachers throughout Liberia. They are: Messrs. J.L. Bettie, Christian Harding, Albert M.S. Harvey, George Flahn and B. Kumar.

The Maths Educator tried throughout the Institute to stress the importance of using concrete material objects to illustrate concepts. They had the participants bring bottle tops, matches and sticks. This way it was possible to get a feel for basic set operations, without merely talking in abstract terms.

The central theme of the institute was "Why does this rule work, where did that formula come from, and what is the motivation for this problem?" With this spirit they were able to develop a healthy questioning atmosphere. Many participants saw the need for understanding the operations of addition, subtraction, multiplication and division rather than being satisfied with only algorithms that are mechanical and promote no understanding.

To show her support and interest Dr. Doris Banks Henries attended many of the sessions. She was, in fact largely responsible for setting up the entire institute. She also arranged for several visitors to come to see what we were doing. Acting Secretary of the Department of Education, Mr. Cummings, was kind enough to open the workshop for us on the 8th.

It turned out quite accidentally that the nine outstanding participants were located one each in different counties. Under the direction of the Maths Educator they could be used to train other teachers in their respective counties.

The Maths Educator, Mr. Alexander, Dr. Banks Henries and the Administrator discussed the results of the 4-Day Institute on November 12. They agreed that the nine advanced participants listed above together with about the same number of Liberian participants who had participated satisfactorily in the programme's Institutes and courses since January 1971 could serve effectively as a basis for popularising the Modern Maths among Liberian teachers if Mr. Alexander was located in Liberia and could work more closely with these teachers.

In all, the Institute went reasonably well, we were able to identify several prospective candidates for further training and we aroused some interest in many others. Below is a list of the participants. Prospective candidates for further training are indicated by asterisks.

Institute for Supervisors and Teachers

PARTICIPANT LIST

Monrovia, Liberia
November 8-11, 1971

<u>Name</u>	<u>School and County</u>
1. Mr. A. Caine	Supervisor, Cape Mount
2. *Mr. James Gross	E.D.S. " "
3. Mr. F. Massaquoi	E.D.S. " "
4. *Mr. James K. Bryant	Antoinette High School, Lofa, Zorzor
5. *Mr. A.S. Dogba	Sanniquellie Central High, Nimba County
6. Mr. A.D. Doloklen	Nyakoi Bee Elem. and Jnr. High, Bong County
7. *Mr. George S. Pawa	Asst. Supervisor, Lofa, Kolahun District
8. Mr. J.R. Paye	Dolokelen Paye Elem. and Jnr. High, Bong City
9. *Mr. A.M. Harvey	Bassa Teenage School, Monrovia
10. Mr. George Flahn	Jnr. High, Newport St. Monrovia
11. *Mr. Christian Harding	Demonstration School, Monrovia
12. Mr. J.B. Dennis	Curr. Centre, Dept. of Education, Monrovia
13. Mr. Isaac S. Zawolo	Gboveh High School, Gbarnga, Bong County
14. Mr. John M. Cole	Gopu Dolo Bai Bang, Bong County
15. Mr. F.N. Sertua	St. Philip's, Bendaja, Cape Mount
16. *Mr. John Monston	Supervisor, Bong, Gbarnga
17. Mr. Joseph Wrepu	Ed. Centre, Bong Mine, Bong Range
18. *Mr. Claudius Johnson	St. Peter's Academy Sinoe, Sinoe County
19. Mr. C.V. Kimber	M.C.S.S. Newport St. Monrovia
20. Mr. A.B. Vivour	Bassa School - Grand Bassa County
21. Mr. B. Aigop	Govt. Trg. School - Grand Bassa County
22. Mr. Danie Jallah	Comonstration School, Grand Bassa County
23. MR. F.F. Shubblefield	Kulahun Public School, Lofa County
24. Mr. Seku K. Kamara	Vonjama High School, Lofa County
25. *Mr. B. Kumar	Cape Mount High School, Cape Mount

REPORT

Meeting of the Management Committee
of the
EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

Place of Meeting: Ministry of Education, Addis Ababa, Ethiopia

Date of Meeting: January 6, 1972

Time: 9:00 A.M.

Present:

- Dr. Ayalew G. Selassie, General Manager of Curriculum and Mass Media, Ministry of Education and Fine Arts, Addis Ababa, Chairman
- Mr. Isaac Hunja, Inspectorate, Ministry of Education, Nairobi*
- Ato Getachew Mekuria, Chief Expert, Teacher-Training, Ministry of Education and Fine Arts, Addis Ababa
- Mr. Gideon Kimote, Head, Mathematics Department, Kenya Institute of Education, Nairobi
- Ato Yohannes Menkir, Haile Selassie I University, Addis Ababa (African Mathematics Program)
- Professor J.E. Phythian, Head, Mathematics Department, University of Dar es Salaam (African Mathematics Program)
- Professor W.T. Martin, Massachusetts Institute of Technology, Cambridge, Massachusetts (African Mathematics Program)
- Mr. John Joanou, Director, African Mathematics Program, EDC
- Ato Makonnen Eunatu, EARMP Administrator, Recording Secretary

The following individuals presented reports on their activities:

- Dr. Bernard J. Shapiro, Foundations Department, Boston University, Consultant Evaluator to EARMP
- Professor Roy Dubisch, Maths Editor/Educator, EARMP, Addis Ababa
- Mr. John C. Fitzgerald, Maths Educator, Nairobi

* Mr. Hunja attended the meeting from 11:30 A.M. soon after his arrival from Nairobi.

Selection of Chairman

Dr. Ayalew G. Selassie took the chair and declared the meeting open. The following additional items were added to the agenda:

VIII. General Fiscal Control

IX. Mode of Operation - University Representation on Management Committee

X. Adjustment in view of U.S. Dollar Devaluation

Note: The sequence of items on the agenda sheet was changed for purposes of convenience. The items were discussed in the following order.

I. Funding Prospects

Mr. Joanou informed the committee that USAID/Washington had refunded the program for 1972/1973 and pointed out that the level of funding was considerably less than was requested. Further, he stated that it was not known at this time whether AID would fund the Program beyond June of 1973 and that there was a likely possibility that the Committee might have to seek funds directly from AID.

The Committee discussed the question of future funding beyond 1973 at some length. It was suggested that the two Governments should be advised to seek other possible sources in case AID stops funding or at least preliminary indication should be mentioned to them. However it was finally agreed by the Committee that the question was too remote at this stage and decision should be delayed until the next meeting.

II. EARMP Legal Status

Ato Bekele Getahun, outgoing Chairman of the Committee had accepted responsibility for obtaining legal status for the Management Committee.

However, since Dr. Selassie had taken the chair, it was not possible to ascertain what progress had been made towards this end. The Committee agreed to discuss the nature of such a document. It was suggested that the document should be informal and acceptable to both Ministries and to EDC. Such a document should enable the Committee to:

- a) accept funds directly from an outside source
- b) provide administrative services to the Program
- c) maintain regional cooperation of the three participating countries
- d) provide the proper mathematical flavor and maintain the stated objectives of the Program.

The Chairman suggested that such a working document be drawn up first by the Committee and then presented to both Ministries for approval.

The Chairman suggested a five minute recess to consult the former Chairman on developments of the legal status question.

On his return the committee learned that informal papers on the legal status had been processed.

Following the brief recess the Chairman expressed the Ministries' appreciation for EDC's continued interest and contribution towards the Program. He also expressed the Ministry's desire for a formal request by EDC for the need of legal status. The Committee therefore endorsed this expression and agreed that the request and a legal document should be prepared as soon as possible.

III. Consultant Evaluator's Report

Dr. Shapiro began his report on Evaluation Activities by stating that his approach to the idea of evaluation is not from the standpoint of good

or bad programs but from feedback - on a continuing basis - to provide information for summary and comparison studies on program activities including the Institutes, Workshops and Correspondence Courses.

In a series of conversations with EARMP staff and the trainee evaluators he discussed:

- a) comparison of Entebbe classes
- b) correspondence courses and institutes in terms of development of math skills and change of teaching practices
- c) evaluation of teacher-training texts
- d) plans and evaluation of Ethiopian Primary I Amharic translation; Kenya's adaptation of Entebbe primary materials.

He preferred a small sample more carefully studied rather than large survey approaches. He stressed that a lot of easily accessible data was available that would constitute most important information for evaluation purposes. It is also important for developing evaluation expertise of the trainee evaluators. A comparative evaluation of traditional modern maths is possible and is being tried in Kenya but this cannot be done in Ethiopia since all the schools are using the same materials.

Dr. Shapiro stressed that in order for the proposed Evaluation Plans to be realized, the Ministries must provide personnel for the tasks and the time in which the tasks be accomplished. The Committee learned that the Ministry has appointed a Trainee Evaluator, Ato Kebede Tiku, former Headmaster of Nazareth Secondary School and Ato Girma Mengistu as Trainee Editor. It was agreed that Ato Kebede be sent a copy of Evaluation Plan and a copy of Dr. Oyoloye's Outline of Evaluation Course he is preparing at the University of Ibadan. Dr. Ayalew urged the course be tailored to the individual needs of the five trainee evaluators and

expressed the hope that the evaluation plans would involve teachers.

Dr. Shapiro estimated that at the present time the trainee evaluators will require one-quarter to one-half of their working time for EARMF evaluation tasks. Mr. Joanou put the question to the Committee whether this portion of their time could indeed be provided; the representatives of both Ministries present answered in the affirmative.

The Kenyan Trainee Editor, Miss Sushila Bakhda, and the Evaluator, Mr. Gideon Kimote, have already been appointed. Mr. Hunja commented there was a strong likelihood that Miss Bakhda would be transferred to the Kenya Institute of Education.

Mr. Hunja stated that the first results of the CPE after a two year course, the P-3 and P-2 exams were very poor. Reasons given were: teachers who took the course did not have enough attention; there was a general problem of a lack of sufficient number of staff. However, Mr. Hunja indicated we would like to take a closer look at these results. Dr. Shapiro hoped to be able to produce some valuable information based on these results. Mr. Hunja said that the Ministry in Nairobi would provide all the information available, both on traditional and modern maths.

Dr. Ayalew stated that introduction of modern maths in Ethiopia for secondary schools was accomplished through an adaptation of the existing Entebbe Secondary C texts. He was not certain of the suitability of these adaptation for Ethiopia and requested some evaluation assistance in what he considered to be serious problems on the secondary level.

The Committee agreed that an evaluation of the secondary texts adapted by Ethiopia was not within the program objectives and further, the program

would not be able to secure additional funds for such a purpose.

IV. Reports on Activities: Ethiopia

a) Classroom Trials: Prof. Dubisch stated that trials of the teacher-training text, Fundamental Concepts of Mathematics, are currently underway in two Ethiopian teacher colleges. He hoped that the program would be able to prepare a Teacher's Guide for the teacher-training text to better fit Ethiopian requirements. This guide would be prepared at the forthcoming summer workshop.

Prof. Dubisch remarked on the proposed meeting of TTI tutors and university people plus outside participants in all subjects for a general review of the TTI syllabus. The purpose of the meeting is to make the TTI syllabus more academically oriented; one way to improve the syllabus would be to exclude extraneous materials.

Prof. Dubisch further remarked that during the visit to Debre Berhan, accompanied by Dr. Ayalew, Mr. Joanou and Ato Makonnen, the lecturers complained that the heavy workload in other disciplines on the primary level prevented them from doing a good in-depth job in mathematics.

b) Visits to TTI's and Schools: Prof. Dubisch reported that he had visited seven provinces and found this to be a very demanding task. Prof. Dubisch added, his initial visits were rather short, but subsequent visits would be for longer duration, in order to give effective assistance to the lecturers, teachers and supervisors. Mr. Hunja suggested more instruction be given on how to conduct in-service courses. On the basis of these brief visits, Prof. Dubisch proposed that he

spend one week in each provincial capital with the supervisors but hold in-service courses for primary teachers as a more effective way of reaching the supervisors. Both Dr. Ayalew and Ato Getachew approved the new proposal as a means of improving the situation.

The Director, Mr. Joanou made it clear that despite the fact that this new approach may improve the general situation, the objective of the Regional Program must at all times be kept in mind; namely the objective is to train middle-level personnel rather than hold in-service courses for primary teachers. He further urged the Committee to proceed cautiously to avoid any violations of our present arrangements with AID.

Report on Activities: Kenya

a) TTC Visits: Mr. John C. Fitzgerald, Maths Educator operating from Nairobi began his report by stating that earlier, his efforts were spread over both Kenya and Ethiopia. (Now that Prof. Dubisch has assumed his post as Maths Editor/Educator in Addis Ababa Mr. Fitzgerald is Maths Educator for Kenya.) He has submitted his first round of schedule of visits to TTC's from January to June 1972; this schedule includes 23 colleges in 6 provinces compared to only five in Ethiopia. He visits a college for one week but the second part of that week he visits the provincial inspector. Through cooperation of the Inspectorate, every attempt is made to have the inspectors at the colleges at the time of his visit.

Mr. Hunja suggested getting advice from the maths educators and then organizing in-service courses to a) assist TTC tutors and b) assist in-service teachers. The KIE/FARMP Guidelines for a one day in-service course were cited. Dr. Ayalew suggested using the Mathematics Syllabus Source-book in this endeavor. Mr. Fitzgerald indicated he had reviewed these

Guidelines during his visits to all the provinces.

b) Correspondence Courses: Prof. Dubisch stated that the correspondence courses had been improvised from primary level materials. The reaction of the participants to the courses has been mixed. In order to improve these results the courses will be tailored to the particular needs of the participants. It was stated that both Ethiopian and Kenyan supervisors are now inspectors.

Mr. Fitzgerald presented some figures on Kenya TTC tutor participation as follows: of a total of 19 tutors 4 left their colleges, only 1 finished his assignments. Fifteen had been using the Basic Concepts texts, 4 were using Transformation Geometry. He cited the difference in responsibility of the tutors versus supervisors: the tutor stays in one college while the supervisor is always on the move. The Committee agreed with Mr. Hunja's suggestion that the schedule of visits and reports of performance in the correspondence courses be made available to all Committee members in advance of the Committee Meeting. Mr. Dubisch added that a set of the 15 correspondence course assignments had been sent to WARMP for their perusal. In closing Prof. Dubisch cited the increased participation and excitement of those individuals who had attended the Nairobi Institute.

V. Incentives

Since the first batch of EARMP participants (tutors, supervisors and/or inspectors) will be completing their period of training at the end of 1972 the Committee undertook a discussion of the general subject of incentives and more specifically the question of awarding a certificate of completion to participants. It was pointed out that it was difficult to find an equivalent to this certificate in the existing educational system.

* At this point Dr. Shapiro and Messrs. Dubisch and Fitzgerald were thanked and the Management Committee continued in executive session.

Mr. Hunja began by saying the certificate, to his way of thinking means, How much more am I worth?, and added, if EARMF participation is the basis for a participant feeling he has improved himself. Mr. Hunja approves of this in principle. Dr. Ayalew remarked that because one is awarded a certificate, this does not mean the individual is up for promotion. He added, in order to receive a promotion, the individual must show that he has improved his teaching abilities. Dr. Ayalew suggested that if the certificate be supplemented with one or two years of proven ability in improved teaching, this could lead to promotion as well as incremental credit. Mr. Hunja agreed that incremental credit was in order. It was mentioned that setting such a standard might have distinct disadvantages, the Committee appreciated that the Ministries would give due consideration to those who were awarded certificates in recognition of their progress.

In light of these considerations the Committee resolved that a Certificate of Attendance be awarded for satisfactory completion of the 2-year course. The design and wording of the certificate shall be presented to the Committee for approval at the next meeting.

VI. Plans for 1972/1973

- a) 1972 Summer Workshop: Prof. Martin informed the Committee that Prof. John W. Green had agreed to accept the dual role of Chairman of the Workshop as well as Chairman of the Writing Group at the forthcoming 1972 workshop. Taking into consideration Prof. Green's summer schedule, Prof. Martin asked whether the dates of July 17 - August 25, 1972 would be suitable. The Committee found these dates acceptable.
- b) Winter Institutes: Two Institutes will be held as usual during December 1972/January 1973 to mark the beginning of a two-year course for the second batch of participants.

The question of venue of the 1972 Workshop was raised. Ethiopia was considered as a likely site. The importance of suitable reproduction facilities and lodgings and a variety of recreation facilities was stressed as important to the success of the Workshop and discussed by the members. It was indicated that such facilities were more readily available in Nairobi than in Addis. The Ethiopian members stated they had no objections to this change and the Committee agreed that Nairobi would be the venue of the Second Workshop.

VII. Subsidiary Mathematics: Prof. Phythian reported on the Subsidiary Maths Meeting held in Nairobi September 16, 1971 at the University of Nairobi and referred to his Report of the Meeting and his letter of December 4, 1971 Ref: 1971/840 in which he outlined the difficulties encountered in getting the group together. Representatives of the University of Nairobi, Makerere University, Kampala, the Kenya Institute of Education and Lenana School of Nairobi attended this meeting which was chaired by Prof. Phythian, University of Dar es Salaam. The group reviewed and discussed five papers on various disciplines. Prof. Phythian pointed out that preparation of a Subsidiary Maths text presents some problems. However, all four countries, Ethiopia, Kenya, Tanzania and Uganda support the effort and have available, qualified writers to prepare the text and a source for some of the funds that will prove necessary to complete the printing of about 5,000 copies of a 2-volume work. A second meeting scheduled for April, 1972 would be necessary in order to write the text.

Prof. Phythian gave some background on the performance of students who had taken a course in Subsidiary Maths. Out of ten students one did excellent; nine were awful. Average grades on traditional Subsidiary

Maths were very low and failing; in a small group, 25-26 students failed. The vast majority take tests and fail them. Prof. Phythian attributed the heavy failures to the unsuitable material available and poor motivation of the students. He felt the texts should be written in not too sophisticated a manner. Ato Yohannes Menkir pointed out that in Ethiopia Subsidiary Maths is taught with University ancillary courses.

Prof. Martin suggested the Committee go on record in the hope that it can make a more suitable contribution and do whatever possible to support this effort. He further suggested writing AID a careful letter citing the need for a Subsidiary Maths text and urging their continued support toward this end.

It was hoped that the program might support a two day meeting towards the end of the 1972 Workshop for follow-up work on Subsidiary Maths.

VIII. Plans for 1973/1974

Mr. Joanou stated it was difficult to say whether or not AID would continue to support the Program beyond June of 1973. However, the Committee thought best to plan ahead for a 1973 Summer Workshop and two Winter Institutes, as usual, bearing in mind the possibility of funds from sources other than USAID. Presumably the Teacher-Training text and a Teachers' Guide for this text would be completed at the 1973 Workshop.

The Trainee Editors are scheduled to visit the United States for a three month experiential period approximately September/November in which they will familiarize themselves with editorial practices, pre-publication tasks, the printing, binding and distribution of completed texts and other areas of interest in the publishing and printing industry.

IX. Next Management Committee Meeting

The next Management Committee Meeting will take place in Nairobi sometime during the Workshop period. A final date within a weeks time of the WARMP Meeting shall be decided at a later time.

X. Fiscal Control

A fairly lengthy discussion ensued wherein Mr. Joanou informed the Committee of problems involved in getting all necessary back-up together with cancelled checks, bills, invoices, the Cash Disbursement Journal and the Petty Cash Envelope properly accounted for and returned to the EDC Accounting Department. This problem made it difficult for EDC to present a formal periodic bill to AID for reimbursement of monies transferred to Africa to insure proper functioning of the programs. Hence, round sums remain unrecovered. Very likely, Mr. Joanou continued, part of the problem lies in different accepted accounting practices in Africa as opposed to EDC practices. The Director concluded:

- 1) the problem is serious enough to warrant either a visit of of a member of EDC accounting department to Addis and Accra one week each location to meet with local administrators and discuss all aspects of accounting problems thoroughly;
- 2) alternatively both administrators visit EDC to accomplish this purpose.

Differences in the credit system in Africa vs. that of the U.S. were cited. In addition, the difficulty in using checks to pay charges; serious problems of transfer within Africa, especially in the WARMP; problems of receiving proper invoices for services rendered. It was agreed that every effort will be made between Ato Makonnen and Mr. Joanou to satisfy EDC requirements and resolve the problem as quickly as possible.

Mr. Hunja objected to the use of program funds to bring the Administrators to EDC and felt that the funds could be used to better advantage. The Committee went on record that everything must be done to solve this problem and asked that a report of this situation be made at the next meeting. The Director tried to make clear that this was a serious administrative problem between EDC and the local administrators. In the meantime Ato Makonnen requested he be sent an EDC accounting manual.

XI. Mode of Operation: African University Representation

Prof. Martin announced, with regrets, that Prof. Pythian would be leaving Africa and would therefore no longer be able to participate as a member of the Committee. A unanimous vote of appreciation for his services was carried and the Committee wished him well in his new undertaking.

A discussion of university representation arose and it was suggested that Dr. Abye Kifle of Haile Selassie I University, Addis Ababa be added as a member of the Management Committee. Mr. Joanou pointed out that while Dr. Kifle would be a welcome addition to the Committee, Ato Yohannes was already a member representing the University. He added, in the event a new member was invited to join, this member would have to replace the present member. Ato Yohannes, since the Mode of Operation provides one university representative from each country. Again, two university members could attend the meetings with one distinction; one would be a full member with voting privileges and the other would attend in the capacity of an Observer.

Mr. Hunja stated he had no objection to a second Ethiopian University Representative as an Observer but requested that Mr. Kizza of Nairobi University be added to the Management Committee as University Representative

from Kenya. This suggestion was seconded by Prof. Martin.

Mr. Joanou expressed his concern that in the past, a Kenyan university representative had always been welcome but had not been a member of the Committee. This had resulted in unequal representation with the Ethiopian members. The Committee expressed its unanimous pleasure in Mr. Kizza's nomination for membership.

XII. U.S. Dollar Devaluation

Ato Makonnen reported that due to the U.S. dollar devaluation, U.S. funds transferred to Ethiopia have less value than before. He added the Maths Editor, Prof. Dubisch and Ato Makonnen were directly affected by this development and requested Mr. Joanou to make suitable inquiries of USAID to see if anything could be done to rectify the situation. Mr. Joanou replied he would write AID and inform Ato Makonnen shortly.

XIII. Vote of Thanks

The Committee extended a vote of thanks to both Ministries for their continued cooperation in program activities. In addition it expressed its thanks to the Ethiopian Ministry of Education for making a Land Rover and driver available for the Maths Editor/Educator visits to the Provinces. The Administrator was asked to write a letter of appreciation to the Ministry of Education on behalf of the Committee.

Mr. Joanou expressed his thanks to both Ministries for their cooperation in providing AID with letters of assurance to print the books adapted at the Summer Workshop. Members were provided with copies of the letters.

XIV. Closed Session

The Committee went into a closed session excluding non-voting members.

End

REPORT

Meeting of the Management Committee
of the
WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

Place of Meeting: Booker Washington Institute, Kakata, Liberia

Date of Meeting: January 10, 1972

Time: 11:00 A.M.

Present: Dr. Doris Banks-Henries, Department of Education,
Monrovia, Liberia, Chairman

Professor Awadagin Williams, Fourah Bay College,
Freetown, Sierra Leone (African Mathematics
Program)

Mr. A. K. Quashie, Ministry of Education,
Accra, Ghana

Dr. D. K. Abbiw-Jackson, University of Science and
Technology, Kumasi, Ghana (African Mathematics
Program)

Mr. Samuel Bortei-Doku, Faculty of Education,
University of Cape Coast, Cape Coast, Ghana

Professor W. T. Martin, Massachusetts Institute of
Technology, Cambridge, Massachusetts, U.S.A.
(African Mathematics Program)

Mr. John Joanou, Director, African Mathematics
Program, Education Development Center

Mr. D. A. Brown, Administrator, WARMP, Recording
Secretary

Observers: Miss Elinor Gilliatt, Education Officer, USAID,
Accra, Ghana

Dr. Bernard Shapiro, Boston University, U.S.A.,
(Consultant Evaluator)

The following were in attendance for some of the time:

Mr. J. T. Norris, Maths Educator, WARMP
Mr. J. W. Alexander, Maths Educator, WARMP
Mr. R. R. Hartman, Maths Editor, WARMP

The Ministry representative from Sierra Leone was not in attendance.

1. Selection of Chairman

Professor W. T. Martin, outgoing chairman, proposed Dr. Doris Banks-Henries. This was seconded by Dr. Abbiw-Jackson and unanimously approved by the meeting. The chairman then requested members to introduce themselves to the meeting. Professor Williams informed the meeting of Mr. Forde's regret for not being able to attend. The minutes of the last meeting were then presented and accepted.

2. Business Arising From the Minutes of the Previous Meeting

(i) WACTE: The Administrator said that there had been a meeting of the WACTE at the University of Cape Coast while he was on trek in connection with arrangements for the Third Institute. He had only heard of the meeting on his return from trek and had then discussed it with the Dean of the Faculty of Education, University of Cape Coast, who it appeared had played a leading role in the arrangement for the meeting. It was not clear why the Executive Secretary (WACTE) did not invite the Administrator to the meeting seeing that the WARMP application for admission into the WACTE structure was discussed at the meeting. However, the Dean said that the Executive Secretary was to write requesting the Administrator to re-submit the WARMP application setting out more clearly what the responsibilities of WACTE would be when the WARMP request was granted. The Administrator was asked to find out from the Executive Secretary what the new WACTE requirements were. The Chairman, Dr. Banks Henries, and the Director of the African Maths Programme, Mr. John Joanou, and the Administrator were asked to deal with this matter and report to the Management Committee at its next meeting.

(ii) Incentives: The Administrator reported that there had been no response from the Ministries to his letter on incentives. Mr. Quashie representing the Principal Secretary, Ministry of Education, Ghana, said that the Ghana Ministry had examined the granting of incentives for a considerable time in terms of commensurate incremental credits but had not yet been able to resolve it. The Ministry was considering a scheme that would embrace all subjects and is not likely to accept one that singled out some subjects as mathematics while ignoring others. He thought that a statement on the level of achievement of the Programme's course would help the Ministry reach a decision on the matter.

The Director of the African Maths Programme pointed out that incentives need not necessarily be in terms of money. He said however that even in East Africa where only certificates had been suggested this too had had its problems. He suggested that the Programme should discuss the subject with the University of Cape Coast in Ghana, the Institute of Education in Sierra Leone and with the head of the Department of Education, University of Liberia. This was agreed. It was agreed also that Ministry representatives should follow up the letter from the Administrator on the subject. At this point the Administrator informed the meeting that as a result of suggestions put forward by Mr. Samuel Bortei-Doku, (Department of Education, University of Cape Coast), the office of the Administrator had succeeded in obtaining the release of Dr. Robert Yawin of the CRDU (Ministry of Education, Accra) to teach a course at the Faculty of Education, Cape Coast, based on the WARMP materials prepared at the first workshop. The meeting expressed satisfaction with the arrangement.

(iii) Local Committees: It was only in Sierra Leone that a local

committee had been set up. It had met in November under the chairmanship of Professor Awadagin Williams. Mr. Roger Hartman, Coordinating Editor (WARMP) had attended the meeting and had afterwards reported that every effort was being made in Sierra Leone to resolve the question of the appointment of a trainee editor cum evaluator. In Ghana, Messrs. Dogbe and Minta who were nominated by the Ministry for appointment as trainee editor and trainee evaluator respectively had still not been released to the programme. Mr. Quashie said that the Administrator had addressed a letter to the Head of the CRDU on the subject, who had declined to take action on the ground that he was not a member of the Management Committee. The Administrator said that he had thereafter addressed another letter to the Principal Secretary. Mr. Quashie agreed to follow up the matter in Ghana and Dr. Banks Henries in Liberia.

3. Funding the Programme

The meeting was informed that USAID had refunded the programme for the period 1972-73. The degree of funding was based on projections made at EDC two years ago. With care it should be possible to operate on the budget, since the new funding was considerably lower than has been found necessary, based on actual operations in the field. A motion by Mr. Sam Bortei-Doku seconded by Dr. Abbiw-Jackson was unanimously carried to express the Committee's appreciation to USAID for the refunding. The meeting was informed that EDC was taking steps to open a checking account for the programme in Monrovia. This should simplify the accounting considerably for the Administrator. At this point the maths educators and coordinating editor joined the meeting.

4. July/August Workshop 1972

(i) It was agreed to hold the next writing workshop from July 17 to August 25, 1972 at the University of Ghana, Legon. A meeting of the Management Committee will be held at the same place concurrently. At the request of the Management Committee, Professor A. Williams and Dr. Abbiw-Jackson agreed to serve again as co-chairmen of the 1972 workshop as well as co-chairmen of the Secondary Writing Group.

(ii) The question of the number and quality of writers was discussed.

a) Secondary Group: It was agreed to select three from each country. Professor Williams and Dr. Abbiw-Jackson who jointly headed the secondary group expressed satisfaction with the quality of last year's group all of whom were either from universities or secondary schools. An effort will be made to get Mr. J. K. Okine to participate this year.

b) Primary Group: It was agreed to select three from each country this year. The meeting was informed that Dr. Shirley Hill who chaired the primary group last year had said that Mr. Julius Jonah could satisfactorily chair the group. This information had not been passed on to EDC. As a result Professor Clarence Hardgrove had been invited to chair the Primary Group.

c) Teacher-Training Group: It was agreed to select three from each country. The texts to be prepared this year will require more mathematics than those of last year. Therefore, this group needs the best available talent, preferably recent qualified graduates. (Elementary school teachers will not be able to cope.) Efforts should be made to recruit university people instead. Dr. John Simbo of Fourah Bay, for example, might be willing to participate. Professor Williams and Dr. Abbiw-

Jackson agreed to make contacts as well as the maths educators. Dr. Grace A. Williams has been invited to chair the Teacher Training Group again at the 1972 Workshop. The Administrator should initiate action for the selection of the participants.

5. Equipment Needs

The first workshop was severely handicapped by inadequate arrangements for typing and duplication of materials. Initially only one typist and a stenographer secretary were engaged. It quickly became clear that what was needed were four or five good typists. Also it took some time to assemble the typewriter machines required for the workshop. Equipment requirements for the 1972 workshop were discussed. It was agreed that 5 typewriters would be needed. Also an electric duplicating machine and a Gestetner stencil cutter both of which may have to be purchased.

It was pointed out that Ministry of Education would require more than just one camera ready copy of the WARMP text for their textbook committee. Ghana, for example, will require as many as twenty. The meeting was informed that facilities exist at EDC for duplicating the camera ready copy.

Break for Lunch

6. A report on the 4-day institute for Liberian participants was presented. Mr. Alexander, maths educator, led the discussion. The institute had been planned for 25 school supervisors. In the event, however, only three of the people who turned up were school supervisors; the rest were primary and secondary school teachers. The purpose of the institute was to identify as many suitable participants as possible and to invite them to the Fourth Institute to be held at Kakata in Liberia in January 1972. Nine were found suitable for further training and it happened to be that

they located one each in nine different counties. The maths educator could use them to organize training courses for other teachers in the various countries. They were invited early in December 1971 to attend the Institute being held at Kakata. At the time of the meeting however only two of the nine invited had shown up.

A severe disappointment resulted when the Honorable Secretary of Education, G. Flamma Sherman, who had accepted an invitation to open the Institute had not turned up; the reason was still not known and he had sent no substitute. (Added note: It was subsequently reported that Mr. Sherman was unexpectedly hospitalized and therefore unable to attend the opening ceremonies.) At the time the meeting began only three of eighteen Liberians expected had arrived. Reasons suggested were that some had not received their letters of invitation, travel money had not been paid to them, permission had not been sought from employers, etc. It was later learned that one at least had taken on a well paid assignment with the Peace Corps in Monrovia.

Attention was drawn to the following extract from the minutes of the last meeting.

"The meeting decided that Mr. Jack Alexander should only transfer to Liberia if Liberia would get together 25 school supervisors for a four day institute to be conducted by maths educators to prepare the supervisors to participate in the January institute. This should ensure that there would be enough active participants in Liberia in 1972-73 to justify the transfer of Mr. Jack Alexander there from Sierra Leone."

In the light of the almost complete absence of Liberian participants from the Kakata Institute the meeting decided to suspend decision on Mr. Alexander's transfer from Sierra Leone until a later date.

Mr. Jack Alexander then gave a brief verbal report on his visits to participants in Sierra Leone, most of whom were primary school teachers,

and a few of whom, were finding the work too difficult. Some others were making good progress. With the help of Dr. Ohuche of Njala University College two recent graduates of that University College have been invited to the course and were attending the current Institute at Kakata. It is planned to recruit all future Njala maths graduates to the institute and correspondence course. One participant, Mr. Tucker, had transferred from his former station and had not notified the administrator of this. Mr. Alexander had had to travel a long distance to reach him at his new school.

A brief verbal report of the Third Institute held in December in Abetifi, Ghana was given by Mr. John Norris. The aims of the third institute were:

(i) To familiarize the tutors with the mathematical content of the new teacher training college texts;

(ii) To give the tutors a clear understanding of how the mathematics and methods of the teacher-training college relate to the mathematics and methods of the primary school;

(iii) To have the tutors think out problems and activities which will facilitate the learning of the mathematics contained in the teacher training texts.

Staffing

(i) Messrs. Alexander and Norris, maths educators, WARMP, taught the maths content classes. Both were involved in the preparation of the teacher training college texts at the First Workshop last July.

(ii) Messrs. Seth Minta, Primary Curriculum Unit, Ministry of Education, Saltpond and Andrew Nyame, Maths Organiser, Ministry of Education, related the content of the teacher-training texts to the methods of the primary school. Both of them helped prepare the primary school texts at the First Workshop last July.

(iii) Dr. Robert Yawin and Mr. Jack Williamson both of CRDU (Ministry

of Education) helped the tutors develop activities and devise problems which would be used in the training college to facilitate the learning of modern concepts and teaching methods.

(iv) Opportunity was taken by Mr. R. Hartman, Coordinating Editor and Mr. E. B. Dogbe, Chanaian Trainee Editor to obtain suggestions for editorial purposes particularly from the sessions dealing with activities and problems.

The evenings were fully and profitably utilized by the staff for lecture sessions on mathematics and methodology.

7. Editorial Activities

Mr. Roger Hartman reported that editorial work had not yet started.

Two main reasons were given for this hold-up:

(i) Most of his time is spent in leg-work, chasing up all matters involved in the logistics of preparing Gestetner copies of the trial editions. The most vexing problem is finding a duplicating machine capable of sustained production;

(ii) Lack of a Trainee Editor in Sierra Leone (not yet appointed) and Ghana (not yet released) has forced Mr. Hartman to obtain the necessary information and to coordinate this information takes much of his time.

In Sierra Leone the secondary material had been put into four classes, two each in Freetown and Bo. In Liberia primary material was in schools in Monrovia and Zorzor. In Ghana primary, secondary and teacher training college materials had been put into schools in Cape Coast and colleges in Komenda and Somanye. However, it was only in Liberia that a trainee evaluator had been appointed and been assigned tasks. In Ghana Mr. Roger Hartman and the administrator had paid occasional visits to the schools and colleges concerned in order to keep up interest. In view of the fact that

evaluation process has not yet begun in Ghana, Sierra Leone or Liberia, Mr. Hartman requested that the date fixed for the submission of the camera ready copy be postponed from October 1972 to January 1973.

The question of finding competent mathematicians to do a final reading of the adapted texts was raised. Mr. Henry Swain or Professor J. W. Green were suggested as candidates to do a pre-final reading of the teacher training text. It was pointed out that Dr. Grace A. Williams could not be left out in these matters. Mr. Roger Hartman was asked to send to either Mr. Swain or Prof. Green whatever is available now for their suggestions and the maths educators should also send their comments on the material to Dr. Grace Williams.

Mr. Joanou expressed the hope that certainly Drs. A. Williams and Abbiw-Jackson could review the adapted secondary texts, and that the Program was not funded to provide a complete review of the other texts nor could it incur the heavy costs of extensive re-writing based on the outsider's criticisms. In short he felt the whole adaptation procedure including pre-publication tasks should be kept as much as possible in African hands consistent with the objectives of the current program. It was agreed however, that the teacher-training text required considerable review and re-writing.

8. Dr. Bernard Shapiro's Report

Consultant Evaluator, Dr. Bernard Shapiro began by saying there were five different problems since the five participating countries have different requirements. The general approach would be formative based on a lot of feedback. Strategies would be small but effective. He cited two basic problems:

(i) We planned to accomplish much but have to date done nothing.

(ii) We had in mind a combination of training the trainee evaluators together with an evaluation of the program.

However, nothing has been done since the trainees have not been made available.

Dr. Shapiro reported that he had discussed the evaluation procedures with the trainee evaluators of Ghana and Liberia. He briefly outlined the main points made in his evaluation plan of October 20, 1971 which had been distributed to management committee members. He said that the evaluation process could not begin until the Ministries released the trainees to the program. It would be necessary to examine the possibility of using other resources if the trainees were not released in the near future. He stressed the seriousness of the problem of not having the evaluators on the job and said that it was necessary to decide whether some other plan should be made for obtaining the feedback from the schools.

The meeting agreed to an alternative plan to use students of evaluation courses at the university level in place of the Ministry personnel if the Ministries failed to release the trainees.

The members agreed to Mr. Joanou's suggestion that a strong letter be sent to all Ministries citing the very serious problems resulting through the failure of the Ministries to provide the trainee evaluators.

At this point, Dr. Shapiro and Messrs. Alexander, Hartman and Norris, having completed their reports, were thanked and the Management Committee continued in executive session.

9. Lack of response to invitations to Management Committee meetings was discussed. The reason could not be determined for failure of the Ministry

of Education, Freetown, either to reply to the invitation to the present meeting nor its failure to send a representative. Mr. Joanou stressed the importance of proper representation at the meetings to insure its regional flavour and share in the proper management of the program. It was suggested and agreed that in the future the administrator should enclose a form with the invitation which members could complete and return indicating whether or not they will attend the meetings.

10. Remuneration of Participants, etc.

The Program's financial responsibilities vis a vis those of participating countries were discussed at length. The transportation and board and lodgings expenses of management committee members attending committee meetings are paid by the program. Instructors at Institutes are entitled to stipends unless they are employees of Ministries engaged in curriculum work, in which case they may in some instances receive an honorarium. The Program is responsible for board and lodging and out-of-country transportation expenses of Institute participants. Participating countries are responsible for any allowances normally payable in each country. These arrangements had been explained to participants at every institute.

The Administrator said there had so far been no Institute at which there had been no agitation by participants for some payment to be made to them to enable them to purchase small items such as soap and blades, etc. At the Second Institute at Port Loko the committee approved a small payment of about \$.30 a day; at the current institute the agitation was getting quite serious and was affecting morale. Dr. Abbiw-Jackson said that the amounts involved were quite small and it was a pity to allow the work of the program which

involved vast sums of money to suffer as a result of the refusal to meet these small demands of participants. Some participants were genuinely unable to transfer any monies due to exchange difficulties or because of the time factor.

Mr. Joanou pointed out that the current program was not funded to pay the participants for attending the workshops as was the case of the earlier Entebbe Workshops where the books were first written. He added, now that the books were being adapted by the countries themselves, it was the responsibility of the respective Ministries to pay their nationals whatever per diem is stipulated in their provisions for such Ministry personnel working outside their country of origin. The meeting decided that the Ministries be requested to state what their government policy is regarding a per diem in this context.

Meanwhile the meeting proposed the following rates for the various categories of participants at program workshops and institutes:

<u>Institute Participants:</u>	\$5.00 for the full period of the Institute. To be paid to the December 1971 as well as the January 1972 Institute participants
<u>Honorarium for Instructors at Institutes:</u>	\$75.00 for the full period of the Institute
<u>Workshop (University Personnel or equivalent)</u>	\$130.00 per week
<u>Workshop Participants:</u>	\$25.00 per week

The AMP Director stated that these proposed rates would have to be reviewed in terms of the budget and general provisions of the regional program. Further, the provision of these rates for participants, by the program, would have to be in accord with Ministry practices covering such matters.

11. General Fiscal Control

The Director of the African Maths Program informed the meeting that the accounts branch of EDC was finding difficulty in sorting out the accounts of both the WARMP and EARMP. He explained that EDC had been unable to recover large sums of money expended by the East and West African Program owing to insufficient back-up documents namely, receipts and statements of charges, etc. It had been proposed to invite the administrators to EDC to sort things out with the accountants, but the EARMP Management Committee had disapproved the proposal at their last meeting and had suggested instead that the matter should be dealt with by correspondence mainly for reasons of cost.

It was suggested that instead of sending both Administrators to EDC it might be cheaper and equally effective to let someone come from EDC. However in order not to embarrass the decision of the EARMP Management Committee the meeting agreed to leave it to EDC to decide what action to take.

12. Maths Educators

The meeting discussed the work of the maths educators and expressed deep satisfaction with their performance. The reappointment of Messrs. Alexander and Norris was unanimously approved.

13. Visit to Accra

The Administrator reported on the meeting held in Accra in July last year between Mr. Beecham P. S., Mr. Mills, and a delegation of the Management Committee. Mr. Beecham understood more clearly the aims of the WARMP as a result of the meeting.

14. (i) Mr. Quashie, Ministry of Education, Ghana, said that since the CRDU is now the wing of the Ministry to see to it that action is taken on WARMP matters the Administrator should copy all correspondence to the Ministry to the CRDU. This would enable the CRDU to follow up if there is delay at the Ministry.

(ii) Professor Awadagin Williams informed the meeting of the very active role which Mr. Forde, Director, Institute of Education, Freetown, had played in WARMP affairs in Sierra Leone since the July workshop and said that Mr. Forde deeply regretted his inability to attend the meeting.

(iii) The meeting wished it put on record their appreciation of the hospitality accorded them by Mr. Moses K. Weefur, Principal of Bocker Washington Institute, Kakata, and asked the Administrator to convey this in a letter to him.

(iv) Finally the meeting had it put on record its deep appreciation of the work of Prof. W. T. Martin as Chairman over a long period of time and his inestimable contribution to the work of the Management Committee.

15. It was agreed to hold the next meeting at the University of Ghana, Legon, in early August 1972 on a date to be fixed by the Administrator in consultation with EDC.

D. A. Brown
Programme Administrator
Recording Secretary

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

EVALUATION REPORT

Prepared by

Dr. Bernard J. Shapiro
Consultant Evaluator

I. ENTEBBE - CONTROL COMPARISON

(i) Situation

In Ethiopia, there are no schools presently using the original Entebbe materials. In Kenya, however, there are a group of schools which have been using these materials consistently over the last seven or eight years. In addition, the Kenya Institute of Education (KIE) administers a nation-wide mathematics paper at the Primary Seven level. This test was administered in November 1971.

(ii) Plans

KIE has selected a sample of seven Nairobi and seven rural classes using the Entebbe materials each of which is matched geographically with a class not using the Entebbe materials and the Ministry has agreed in principle to make these data available for EARMP's Entebbe-Control comparison. The KIE has also agreed - in a visit which I made with the Trainee Evaluator, Mr. Gideon Kimote to Mr. Ronald Hughes - to do the computer analysis which will provide not only total score data but also option choices, discrimination indices, item test correlations, etc. In addition, when the Ministry releases the test form itself, Mr. Kimote, in consultation with this writer will develop several subtest analyses designed to probe more adequately the differences between the two curriculum groups.

As indicated in the previous evaluation report, the trainee evaluator will construct a new test instrument suitable for the Entebbe-Control comparison at the Primary Four level. Approximately five experimental and five control classes will be selected, and if permission is extended, the testing will take place in November 1972. As with all Entebbe-Control comparisons activity is limited to Kenya.

(iii)

Although Kenya has appointed its trainee evaluator, Mr. Gideon Kimote, no release time has yet been made available to him to carry out his tasks let alone the possibility of attending the special evaluation course to be given by Dr. T. Yoloye at Ibadan in September of 1972. The plans as outlined above are dependent on such time becoming available in the near future.

II. SUMMER WORKSHOP MATERIALS

(i) Situation

The first volume of a teacher training text was produced at the 1971 Summer Workshop. This text is currently being tried at four teacher training institutions, two in Kenya and two in Ethiopia, there being an urban and a rural school chosen in each case. Along with the materials, each trial tutor has received copies of the questionnaire prepared at the 1971 Workshop and which is to be completed and returned as each text chapter is finished.

(ii) Plans

Both the Kenyan trainee evaluator, Mr. Kimote, and the Ethiopian trainee evaluator pro-tem, Atu Girma have agreed to take on the responsibility of checking with the teachers at the trial sites in order to encourage the return of the questionnaires and of then analyzing and preparing a report summarizing their responses for use at the 1972 Summer Workshop. In addition, classroom visits will be made should time be available.

(iii) Notes

All four tutors trying the teacher training text were personally contacted. In Kenya, both tutors were most enthusiastic and wondered how soon the materials could be made more widely available. They noted that the universal introduction of modern mathematics into all Kenyan schools made such teacher training materials an essential contribution. In Ethiopia, the two tutors were also very positive as regards the materials themselves, again especially in view of the introduction of the Amharic version of the Entebbe materials. They did point to a pedagogical difficulty, however, in that they feel their students' goal relates to possible university entrance rather than competent classroom teaching so that there is a push from that quarter for the inclusion of more academic mathematics.

Prof. R. Dubisch reports that John Norris, the new mathematics inspector for Kenya, has responded somewhat negatively to the teacher training text. In Professor Dubisch's view, this reaction is not related to technical difficulties but rather to a difference in philosophy as well as differences in experience and understanding of teacher training for the elementary school.

If release time is not made available for both the Ethiopian and the Kenyan trainee evaluator, these plans will have to be abandoned or alternative resources will have to be made available.

III. INSTITUTE PROGRAM

(i) Situation

Kenya: The participants about half of whom are teacher training tutors and half of whom are in various elementary school supervisory positions have now completed two institutes and one year of correspondence

course material. In terms of level of mathematical achievement, a pretest was given at the first institute and a posttest at the second. In addition, the correspondence course records of the maths educator, Mr. John Fitzgerald include for each participant:

- (a) his/her professional position,
- (b) the grade for each completed assignment,
- (c) an evaluative paragraph on the participant's teaching or in-service training practice, and
- (d) reasons, if appropriate, for non-completion or leaving of the program.

To date, little systematic classroom visitation has been done since, for a large part of the year Mr. Fitzgerald had to cover both Kenya and Ethiopia and most time at the colleges seems to have been spent in consultation rather than observation.

I was not present at the Kenyan institute, but reports from the staff and from the two tutors trying the teaching training materials indicate that it was well attended and received although the maths educators seemed to feel that a greater emphasis on pedagogical technique as opposed to mathematical theory would have been appropriate. The Kenyan response to the correspondence course has been more disappointing. The maths tutor's group complain either that it is too easy or that they have not enough time to devote to it. On the other hand for the supervisors and inspectors for whom one cannot assume a suitable background and/or interest, the course may be too difficult. There had been some drop-outs from the program, but it seems relatively legitimate in that it relates either to a resignation from the teacher training college or the emigration of an expatriate staff member. A questionnaire has been prepared by the program administrator, Mr. Eunatu Makonnen, and distributed to the participants to enable them to formally respond in terms of their reaction to the institute program.

Ethiopia: The participants, only a few of whom are maths tutors, the others tending to be supervisory personnel, have completed two institute programs and one year of the correspondence course material. Since no pretest was administered to the Ethiopian participants at the first institute (they generally felt it was beneath them) no posttest was given at the second. However, the correspondence course records of the Ethiopian maths educator, Prof. R. Dubisch will include for each participant:

- (a) his or her professional position,
- (b) the grade for each completed assignment,
- (c) an evaluative paragraph on each participant's teaching or in-service work, and
- (d) reasons, if appropriate for non-completion or leaving of the program.

Visits to the schools and colleges by Professor Dubisch have been rather introductory to date with no more than one day being spent per visit and much of the time being spent touring actual classrooms.

The second Ethiopian institute was well attended, and the instructional time was tightly and well organized by the EARMF staff with quite effective use being made of visiting classroom demonstrations. Interviews with ten of the participants yielded complaints about travel allowances etc., but nothing but praise for the educational value of the effort. The

tutors seemed especially pleased by the special arrangements made for their group although their mathematical sophistication appeared to be somewhat less than they themselves imagined.

In terms of the correspondence course, the tutors seem to ignore it altogether while the response from the supervisory group is quite good although there is a need for greater individualization of the materials in terms of the heterogeneity of background and experience from which this group comes.

(ii) Plans

The pretest and the posttest data for Kenya will be analyzed by the trainee evaluator when release time is made available. The trainee evaluators in both countries will also analyze and report on the correspondence course data when it is complete. This latter analysis will include not only a consideration of the achievement and teaching practice data but also material relating to the number of assignments completed, reasons for non-completion, etc. Finally, the trainee evaluators for both countries will analyze the data from the questionnaire distributed to assess the participants' reactions to the institute program. At a later date, a further questionnaire will be prepared for this same group.

(iii) Notes

As with the evaluation of the trial materials of the teacher-training text, the above plans are dependent upon the availability of time on the part of the trainee evaluators.

Widely suggested on the part of the participant-tutors is the creation of a Teachers' Guide to go along with the teacher-training text.

In response to the difficulties with the correspondence materials, the maths educators are currently planning to rewrite the correspondence materials so that two or three different tracks are available.

Although not envisioned as part of the original EARMF design, the actual composition of the participant groups should lead to an ever greater emphasis on in-service models which the supervisory personnel have great use of in view of the nationwide introduction of Entebbe-type materials in both Kenya and Ethiopia. Both maths educators are currently embarked on such projects and both should be encouraged in these efforts.

Efforts will be made to administer pre- and posttests to the **Second** Ethiopian Institute group. Responsibility for the construction of the instruments rests with the Ethiopian trainee evaluator.

IV. TRNNEE EVALUATORS

(i) Situation

Both Ethiopia and Kenya have appointed trainee evaluators, with the

understanding that release time will be made available for ongoing work as well as attendance at the special curriculum evaluation course at Ibadan in the autumn of 1972. However, to date, no release time has been made available. This places the whole evaluation design in great difficulty since the design is based on the idea that the data for the program evaluation can be collected by the appropriate supervision of the trainee evaluators. Thus, if the trainee evaluators are not provided with release time, the program will fail both in its training and its evaluative function.

(ii) Plans

If no definite commitment is received from the appropriate ministries in the near future, alternative resources be made available to salvage at least the basic data needed for some meaningful evaluation of the program.

February 6, 1972

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

EVALUATION REPORT

Prepared by

Dr. Bernard J. Shapiro
Consultant Evaluator

I. ENTEBBE - CONTROL COMPARISON

(i) Situation

As per the previous report, the originally envisioned comparison study was deleted from the WARMP evaluation plans. However, in order to provide input data for the 1972 Summer Workshop, it had been planned to administer the Entebbe Primary Three and Primary Four test materials, if it were possible to locate classes who had been consistently using the Entebbe program.

Since none of the participating countries have both appointed and made release time available for a trainee-evaluator, no progress has been made on this front as considerable time and effort is required if the classes are to be located, the tests administered and the data adequately summarized and analyzed.

(ii) Plans

In anticipation of the hope that at least one of the countries will make release time available for its trainee evaluator in the months before the 1972 summer workshop, EDC will ship to the WARMP office enough Primary Three and Primary Four test materials to cover three or four classes at each level. When and if the trainee evaluator is available, classes will be selected. Preferably, these latter will be Entebbe classes but failing that possibility, modern mathematics classes using other programs will be substituted.

(iii) Notes

Previous plans to have Roger Hartman prepare the testing materials from original copies have had to be abandoned since Mr. Hartman's editorial responsibilities are heavy and the available duplicating equipment is somewhat inadequate.

II. SUMMER WORKSHOP MATERIALS

(i) Situation

The 1971 summer workshop prepared:

(a) a teacher training text,

- (b) revised Primary One and Primary Two texts, and
- (c) revised Secondary One text.

The original plan intended that in each country, each of the prepared materials would be tested in two locations with teachers who have had Entebbe experience as well as with those who have not. As per previous evaluation report, teacher questionnaires and process notes of classroom visits were to be the main data sources of the materials evaluation.

As of January 1972, the following schools were serving as trial sites for the 1971 Summer Workshop materials:

<u>Country</u>	<u>Text</u>	<u>Location</u>
Ghana	Primary One	Cape Coast
	Primary Two	Cape Coast
	Secondary One	Cape Coast
	Teacher Training	Komenda Somanya
Sierra Leone	Primary One	Freetown
	Primary Two	Freetown
	Primary One	Bo District Council School
	Primary Two	Bo District Council School
	Secondary One	Albert Academy
	Secondary One	Bo Secondary School
Liberia	Primary One (Geometry Only)	Monrovia

As can be seen from the above, it was not possible to obtain two trial sites for each set of materials in each country. Had trainee editors and evaluators been available, efforts to place the materials may have borne greater fruit. As it was, only the above placements were made, and the teachers used were almost in every case those with some active association (e.g., as a workshop participant) with the WARMP program.

Of even greater concern than the lack of complete placement is the lack of evaluative data relating to the materials. As per the previous report, Mr. Hartman was to send out chapter-by-chapter questionnaires to the teachers and process notes were to be taken during regularly scheduled classroom observations. No replies have been received to the questionnaires that have been sent out, and Mr. Hartman's other tasks make it virtually impossible for him to carry out the visitation program personally. The issue is again one of the non-availability of the Trainee Editors and Evaluators and until at least the latter are appointed, we can expect little further progress in this area.

(ii) Plans

Of the three countries involved, Ghana, Sierra Leone, and Liberia, two have appointed trainee evaluators. Ghana has appointed Mr. Seth Minta and Liberia has appointed Mr. Joseph Bettie. However, during the Decem-

ber/January Institutes, only Mr. Minta was available, and although release time had yet to be arranged, arrangements were made for him to conduct special teacher interviews at each of the Ghanaian trial sites should time for such work be allowed. Plans for the Sierra Leone and Liberian trials will have to await further action by the appropriate Ministry.

(iii) Notes

Particular concern should be expressed about the evaluation of the Teacher Training text prepared for WARMP at the 1971 summer workshop since those interviewed at the December/January Institutes (Messrs. R. Hartman, J. Alexander, J. Norris, J. Williamson, D.A. Brown) all agreed that this text needed extensive further work. Some (e.g., Messrs. Norris and Alexander) felt that the nature of this work was primarily editorial while others (e.g., Messrs. Williamson and Hartman) felt it was more substantive in nature. In any case, WARMP should assume responsibility for some serious review of this material before its final revision.

III. INSTITUTE PROGRAM

(i) Situation

Ghana: The participants, almost all of whom are tutors in teacher training colleges have now completed two institutes and one year of correspondence material. In terms of mathematical achievement, pretests administered at the first institute were followed up by a posttest at the second and records of the correspondence course include the grade for each completed assignment and a descriptive paragraph indicating the maths educator's perception of the effect of the program on the tutor's teaching practice. The use of observation scales by the maths educators as outlined in the previous evaluation report has not been possible as the case load for each of the two maths educators has proved to be too large to allow for time series visits on their part.

In terms of my own observations at the December/January Institutes the interest level among the participants appeared very high. Almost all of those eligible came to the Ramseyer Center at Abetifi and stayed for the full term. Attendance at classes was excellent at both morning and evening sessions and many small groups were seen to be working on their own problems during the afternoon hours. Of the twelve participants individually interviewed, all reported satisfaction with the institute itself. Reactions to the correspondence course materials were much less enthusiastic. Dissatisfaction seemed to stem from two sources:

- 1) the course was based on old materials in which there were both mathematical and vocabulary difficulties, and
- 2) the lack of individualization.

Even among the Ghanaian tutor group there is a wide heterogeneity in terms of background and ability. As it is, the course appears either to be too easy or too hard.

Liberia/Sierra Leone: Here too, two institutes have been completed and one year of the correspondence material. However, these participants

are quite different from the Ghanaian group in that most of them are in school or supervisory positions rather than working as maths tutors in teacher training settings. The entire population of maths tutors in these two countries is simply not large enough to warrant the WARMP program for that group alone.

Pretests and posttests have been administered in this setting as well, although the much less stable nature of the participating group means that there will be relatively few participants for whom both a pretest and posttest score will be available. Records of the correspondence course and descriptions of the teaching practice are and will be available as well for the Ghanaian sample.

Participation at the institute itself was not as high as had been expected especially with the Liberian participants few of whom had arrived during the first days of the institute program. Interviews with six of the Sierra Leone delegation indicated that as with the Ghanaian group, there was positive response to the two-week institute but less appreciation for the correspondence materials. The general level of mathematics background is not as high in this group; thus, individualization of the correspondence program is even more critical. All six interviewees also indicated that more frequent visits by the maths educators would do more than any other single thing to raise the level of the offering at the teacher training colleges.

(ii) Plans

The pretest and posttest data will be analyzed by the trainee evaluators when release time is made available. The trainee evaluators will also analyze and report on the correspondence course data when it is complete (i.e., toward the middle of 1972). This latter analysis will include not only a consideration of the achievement and teaching practice data but also material relating to the number of assignments completed, reasons for non-completion of the program, etc. Finally a comprehensive questionnaire will be prepared to tap more systematically the reactions to and evaluations of the Institute by the participant group.

(iii) Notes

As with the evaluation of the trial materials, the above plans are largely dependent upon the availability of time on the part of the Trainee Evaluators. There seems precious little point in repeated trips to Africa and repeated articulation of plans unless there is some confidence that these plans can indeed be carried through.

Some consideration should be given to the construction of an entirely new set of correspondence material for the Second Institute Group. The maths educators seem to have striven mightily to adjust the existing materials to the obvious need for individualization; it might, however, be more productive to begin afresh.

Since many of the Liberian and Sierra Leone participants are not maths tutors, some thought should be given to whether or not this should affect the organization of the Second Institute series. For example, there might be greater concern with supervisory rather than teaching practice, greater concern with in-service organization than classroom organization, etc.

IV. TRAINEE EVALUATORS

(i) Situation

As outlined several times above, Sierra Leone has neither appointed nor released time for a Trainee Evaluator while both Ghana and Liberia have appointed but not provided the necessary released time. This places the entire evaluation program in jeopardy since its design is based on the concept that much of the learning will consist of help in doing a variety of increasingly sophisticated evaluation tasks. Thus, if the evaluators are not appointed not only will the training component suffer but also the program evaluation component will be irreparably damaged.

(ii) Plans

I would suggest that EDC make one further effort at obtaining a firm commitment from the participating ministries as to the Trainee Evaluator. If this should not be forthcoming, other resources must be made available if any program evaluation is to result. A number of preliminary investigations have been made in terms of the possible use of University-based African personnel and this represents at least one possibly viable alternative. Others could be worked out once a clear cut decision is made as to current status.

February 14, 1972

General Report for 1971

East African Regional Mathematics Program

by

John C. Fitzgerald
Maths Educator, Nairobi

Reference is made to the original proposal for a regional program, dated April 22, 1970. The proposal outlined the background, common problems, manpower considerations and went on to give details of a proposed course of action. This is now looked at in relation to the program as it has operated in East African since December 1970. Although some references are made to Ethiopia most remarks apply to Kenya which is now my area of responsibility.

A. PARTICIPATION

In both Ethiopia and Kenya the problem was not quite the same as in Ghana where activities would be centered entirely on tutors in Colleges. In Ethiopia and Kenya there was also an established force of primary school teachers already in service. Another important consideration was that implementation of their primary modern mathematics programs was imminent in both countries - January 1971 in Kenya and September 1971 in Ethiopia.

It was therefore understandable that both Ministries asked for the immediate participation in our program of all colleges and all provinces. Hence participants had to come from all areas. It was not possible to choose them from certain geographical areas only as originally proposed. It was equally obvious that the proposals for the mathematics educator's visiting program would also have to be extended over areas wider than anticipated. Moreover he would have to operate in both countries until the appointment of the second mathematics educator. Now that Professor Dubisch is fully operational in Ethiopia a much more satisfactory visiting program to allow for longer stays in Colleges and provinces is planned for 1972 (see attached schedule of visits).

B. MATHEMATICS EDUCATION

1. Institutes

We have now been able to get a good deal of feedback on the value and outcomes of the first institutes. This has been gathered through personal contact, correspondence, assignments and more recently in response to the questionnaire recently circulated by Ato Makonnen. At the 1971 institute a common remark has been something like, "Without the 1970 Institute I could not have in-serviced the teachers or have entered their classrooms with any confidence."

2. Correspondence Courses

Although these have provided ample opportunity for all to ground themselves well in basic concepts, the response - especially for Kenya supervisors and Ethiopian tutors - has been disappointing. However a good many have attached a significant importance to the correspondence assignments and other aspects. As a result of our experience we plan more practical correspondence assignments for the future with more motivation built-in to them. Although the inspectors have not all responded well (yet three inspectors completed all assignments) there is no doubt that they have got down to their field work of in-servicing their teachers.

3. Visits

A. Tutors

All of the activities proposed for the mathematics educator's visits have been carried out subject to the time limitations referred to above. Correspondence assignment queries have been attended to during visits as well as through correspondence. The 1970 proposal referred to assistance to be given to tutors in introducing new courses. The need for this has struck the colleges forcibly since the primary school program began in January. There was thus, good motivation for the sessions which I had with principals, heads of math departments, all maths tutors and some education tutors of general methods. Our EARMF tutor was often only a junior member of staff and so it was necessary to operate through the heads of department. Their cooperation and that of all principals was never in question. A few colleges had not been represented at the 1970 Institute and some intensive mathematics sessions were held with their tutors. In any case direction and guidance was given to those colleges which needed it regarding the introduction of a more suitable program. The introduction of the new basic (P3) syllabus in early 1972 will form a focal point for this activity when I visit each college again.

B. Inspectors

Inspectors were seen wherever possible. Their main task, amongst many others, was that of in-servicing Standard I teachers. The magnitude of their task is indicated by a glance at Appendix I to my third term report which shows the great number of schools by districts and the comparatively small number of inspectors. Only those whose names are underlined are EARMF participants and they are the only ones with any degree of modern mathematics training. There is a tremendous need for further and quick - as possible orientation of the other inspectors, assistant inspectors and education officers entrusted with supervision.

On the visits to provinces I was able to visit some primary classes and some in-servicing courses. It is planned to do this moreso in 1972 because the inspectors need guidance where it is

most important - in the actual classrooms. The guideline courses and materials have been referred to in my third term report. At the 1971 institute due emphasis has been given to the problems of teaching and in-servicing as we have observed them in the field in both countries.

4. Primary College Syllabus and Text Materials

Our program called for assistance to tutors in drawing up syllabuses. In Kenya this has been the responsibility of the KIE. However EARMP has been directly involved in drawing up the much needed basic syllabus for P3 entrants to colleges. As one who was working in all colleges my views were sought and I served as a member of the KIE Primary Mathematics Panel which produced P3 syllabus. The EARMP writing workshop participants had also just arrived before the final meeting which they were invited to attend. Much useful interchange of ideas was therefore possible immediately before the EARMP participants got down to produce the first of the training college texts at the workshop. Up till now colleges have not had a text suitable for, or one designed for, primary school teacher-training. There are a few odd copies of the old Basic Concepts and KIE Handbook but other texts are academically oriented. During my visits I was able to supply each college with ten copies of the African Mathematics Program's (AMP) Handbook for Primary Teachers. This proved so popular that Colleges asked for more so I adapted it to be metric and the Ministry of Education reproduced enough to give each college fifty copies. The Ministry of Education and the Colleges bore all the expenses of the reproduction.

It is appropriate to mention here that the AMP's series of six Primary Mathematics texts form the model for both the Ethiopian and Kenya Primary Mathematics texts now under continuous production at something over half million copies for each grade level each year. The introduction of modern mathematics throughout all primary schools in Ethiopia and Kenya has arisen directly from the African Mathematics Program. The East African Regional Mathematics Program is continuing the link and of course it arose out of the need to provide leadership training for tutors and inspectors at primary school level.

The workshop text for trial in 1972 Fundamentals of Mathematics, was produced and the exercise also provided initial training for editors from Kenya and Ethiopia. That the book ought to be welcomed when it becomes available for general use in late 1972 is indicated by the reaction of the head of Mathematics department of one of the largest and most efficient colleges (see copy of his letter - Appendix C).

Audio Visual Material

The EDC films were seen by most college students and tutors and by Supervisors and some teachers as well in Ethiopia. These were the first films they had seen showing modern mathematics being taught in African classrooms to African children by African teachers. As such the impact of the films was tremendous. Apart from the message of activity and

discovery learning their value lay also in the satisfaction and confidence inspired to go out and do likewise--or better. Films made in Ethiopia and Kenyan classrooms would be even more appropriate now that the new programme has begun in all primary schools. Some interesting results could follow if the Kenya Institute of Mass Communications and the Ethiopian Mass Media Division could cooperate in this activity as well as in TV programmes.

Educational TV

I have been a member of the panel which has met to plan a series of 8 programmes in basic concepts of mathematics to be directed to training Colleges during the third term of 1972. Ethiopia of course has already produced a good many mathematics TV programmes for schools mainly at secondary level. Its programme on symmetries could well prove useful to Kenya.

REFLECTIONS ON 1971 AND A FORWARD LOOK TO 1972

A. PARTICIPATION

The Kenya Ministry of Education's decision in late 1970 to include all colleges and provinces from the start in the EARMP has proved to be a wise one. Individual tutors have dropped out, having left colleges (4 Kenyan tutors and 4 expatriates) but the colleges have replaced them. Other colleges not represented last year have sent representatives to the 1971 institute and there is every indication that the new tutor group is much stronger and much more interested. Most of the inspectors have come again and a few more as well. They also are notably more settled and interested than they were a year ago--very largely, I feel sure, because of their needs and interests arising out of their 1971 classroom experience. We can look forward to a still greater improvement in the future when inspector participants can be selected, out of an increasing force, on the basis of interest in, and ability for, mathematics as a subject in which they will probably specialize. I see no problem with tutors whose job, in any case, is exclusively connected with mathematics.

Institute and Correspondence Courses

The second Kenya Institute has now been run and reported on with special reference to the more practical slant given as a result of our experience in 1971.

Visits

As seen in the schedule of first visits for 1972, I plan to spend a week at a time in one centre where there are two colleges. It is hoped that inspectors can be present too for this strengthens the links they have already established with college tutors. In any case provision has also been made to give exclusive attention and time to inspectors' problems. During these periods we hope to go out together to as many classrooms as possible. Activities will include:

1. Correspondence study queries
2. Guidance and assistance in relation to the new (P₃) and proposed (P₂/P₁) syllabuses
3. Guidance on mathematical concepts
4. Mathematics teaching guidance through observations and demonstrations in classes.

As I have observed, colleges, in varying degrees, have taken a big step in 1971 towards establishing more suitable courses. PEO's are expressing confidence in the current graduate of most colleges as one they can rely on to cope with the new programme in schools. This is, of course, truer of some colleges than of others and I shall direct my attentions accordingly.

An interesting development is that also referred to in the Siriba letter (Appendix C). This is the training of recently graduated and other P₂ and P₁ teachers selected for intensive instruction in how to conduct their own in-servicing in their own schools and areas. At least one other college that I know of, Kigari, also gives such instruction in college to its P₁ and P₂ teachers. EARMP participant Mr. Joe Mgari is playing a key role in Kigari as is Mr. Washington Juma in Siriba. Through my visits EARMP is therefore also involved in collecting and passing on good ideas from one college to another and from inspector to inspector throughout all the provinces.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

Third Term 1971 Report

by

John C. Fitzgerald
Maths Educator

During the first two terms in 1971 EARMP had centered its main activities on the training college programme. Activities included assistance to EARMP participants in their correspondence studies, guidance in introducing the modern mathematics syllabus and methods, and use of visual aids. We were also involved through association with KIE in producing a new basic syllabus for colleges. In August EARMP produced a trial edition of the Fundamental Concepts of Mathematics for future use in colleges.

Work with inspectors in the field had been limited in early 1971. It was therefore fitting that we should give more attention to inspectors' problems and this would fit in with college programmes during third term when so much of the tutor's time is taken up with the final assessments, examinations and teaching practice of their students. In my September report I stated that I hoped, in cooperation with KIE to produce some guidelines for one or two-day courses for Standard I and 2 teachers in-service. The limitation to 1 or 2 days is only because that is the maximum time inspectors get to in-service these groups. There are a great number of primary schools and only a few EARMP participant inspectors. (See Appendix I showing large number of schools over widespread areas). Economic considerations also prevent the holding of courses lasting more than a day. The need for directed guidelines on how best to use this short time was therefore evident. But there were more powerful reasons still, namely:

1. Observations during early 1971 (confirmed by KIE and Professor Dubisch) revealed that the prime objectives were not being achieved at in-servicings.
2. Courses had been stressing new topics like sets, bases, etc., without directly relating them to Standard I syllabus. New approaches to teaching were often omitted altogether.
3. Irrelevant topics were apt to be receiving too much attention, e.g., operations in other bases. One enthusiast had been known to be giving up a good deal of his time to demonstrating Euclid's proof that there is no greatest prime. This was a case of "giving them what they gave us."
4. Many teachers in practice were observed to be pretty ignorant of the content and directions contained in the Teacher's Guide and these are of vital importance.

The net result of these observations by us, and separately by the KIE Primary Mathematics Department, was that most courses stressed "new mathematics" topics without relating them to lower primary needs. The philosophy behind the guidelines courses was that the lower primary teacher must be taught first how to use his Guide. He would be given some necessary mathematics background but only so much as he could be expected to absorb in a day. Further, mathematics would develop and grow out of more detailed study of the guide, unit by unit, as the year went on.

The mathematical background would have more meaning when it was being learned in response to a need as it arose. In the same way it was known that much time was being spent at short courses on construction of aids well beyond immediate needs. Here again the teaching aids are more meaningful if made to aid the teaching of a new concept at the appropriate time.

When the guidelines were mimeographed, KIE felt strongly that I should go out to explain them in all provinces. As the exercise was to involve all of our EARMF inspectors (and some tutors), a series of courses were planned and carried out as follows:

Date	Province	Centre	P.S.I.	APSI	College Tutors	A.E.O. PSS	A.E.O. Admn.	Other	Remark	
12/10/71	Nyanza	Kisumu	5	4	3					
13/10/71	Western	Kakamega	4	6	2					
18/10/71	Central	Muranga	4	3	8	4				
22/10/71	Coast	Mombasa	5	6	2			1	Prov. Educ. Office	
5/11/71	Rift Val.	Nakuru	8	11	4	5	5			
9/11/71	Eastern	Machakos	3	1	4	14				
10/11/71	Eastern	Embu	1	4	4	10	2	1	(Language Tutor)	
17/11/71	Central	Kiambu	1	2	4	8				
	Central	Nyeri	(postponed to January 1972)							
TOTAL			31	37	31	41	7			

P.S.I. = Primary Schools Inspector
A.S.P.I. = Assistant Schools Inspector
AEO/PSS = Assistant Education Officer/Primary Schools Supervision
AEO/ADMIN = Assistant Education Officer/Administration

At first, owing to short notice, only P.S.I.'s and some A.P.S.I.'s came but later P.E.O.'s were asking for the inclusion of those assistant education officers (AEO/PSS's) who were being entrusted, in increasing numbers, with primary school supervision. One P.E.O. came to spend an hour at the course in his province.

Guidelines materials were given out to all participants for future reference. The one-day meetings were most appreciated and there was general agreement that the instruction and materials were just what they needed at this time and before 1972. P.E.O.'s were very keen to include AEO's and they asked for longer courses with more mathematics. I have thrown this back to the EARMP inspectors and tutors. There has been quite a lot of college/inspector collaboration in this respect and there is no doubt that there will be a continuing need for such courses for all of those people whose job is mainly concerned with primary classroom teaching. The EARMP role to date has been vital and the people concerned with inspection can absorb all the assistance we can give them.

For the first week in November Professor Dubisch came down from Ethiopia to plan with me the December and January Institutes. We were also able to see a selection of mathematics teaching in urban and rural classrooms. What we saw reinforced what we were already thinking about regarding the needs of both the tutors and the inspectors at the coming institutes in December and January.

December 1971

Siriba College,
Private Bag,
Maseno.
20th December 1971

Dear John,

Many thanks for the 25 copies of Fundamental Concepts of Mathematics you sent via Washington Juma. A pity they are so few! In fact I am writing to see if there is any possibility of getting some more. If not, what are the chances of getting more of the new edition of the Teachers' Handbook. If they were available we could take another 100 and find them very helpful. All the students here have been very impressed at finding most of what they are required to know inside two covers and I have been besieged by the departing P/1 and P/2 groups to know where they can buy them! We would appreciate some more however few!

The Fundamental concepts seems to be the answer to our prayers if we can get it in sufficient quantities. We have decided to use it with both our P3 groups coming in this year and we will keep you informed on how it works out. If we can get enough copies when it comes out we intend to make it a book for compulsory purchase by all students coming into Siriba.

We are trying an experiment here next year in which all grades P/1, P/2 and P/3 will do the whole range of upper primary and lower primary work in Maths. All will have 6 periods in their first year of which 2 will be devoted to lower primary. In the second year some students (about half) will specialise in Maths, getting 9 periods of which 2 will be for lower primary. The non-specialist group will have 3 periods in the second year of which one will be for lower primary. It should lead to a better standard of maths.

Washington and I are at present doing a course in Standard I and II Maths for 40 selected teachers with a good Maths background from Siaya District. It is the intention that they will be given a good grounding in the material and methods of Books I and II and they will then go back to their Locations and in-service the teachers there. We will see how it works! On 11th of January we have a group of teachers coming from Kisumu district for the same work. I also did a course in Standard I and II Maths with the primary Schools' Inspectors for Western and Nyanza provinces -- I am not sure all of them realise the huge task ahead of them!

However so much for the present. Any books you can find for us will be a big help!

Regards,

(signed)

Joseph P. O'Connor

Extracts from Comments by Kenyan Participants on EARMF

Submitted by
John C. Fitzgerald

E. Omukhulu - 19/7/71

"I would like to tell you that the assignments you send to me are enlarging my understanding of mathematical concepts so far as new methods are concerned. Personally I do like this subject but the delay in delivering my answers to you is due to fatigue because after supervising schools for the whole day I find myself exhausted in the evening and it becomes difficult for me to concentrate on my assignments. This being a new method requires a lot of concentration before solving any given problem."

A. Chimungeni - 25/1/71

"I am sorry I had to submit this rather late due to the fact that I have been heavily engaged on the in-servicing of Primary I teachers in the modern maths."

J. A. Shihundu - 14/5/71

"Since the visit you made on 4 February 1971 I have conducted two main in-service courses namely:

1. Primary School Maths Teachers for Standard I and II.
2. Headmasters and Headmistresses from five districts

and the progress we are making at Chadwick College is very encouraging. We are covering new mathematics almost to the same degree of profoundness as to the secondary school Form I syllabus..... One big problem is that my students are a mixture of varying mathematical standards.....the speed of progress is therefore rather slow though the new approach appears to give a new horizon of learning among most of the students."

J. Okoth - 1/7/71 (On tapes)

"Please find enclosed the six tapes you left with us when you last visited this college. I am sorry for the delay but the reason is mainly because Siriba College and the Supervisor of Kisumu district borrowed them for some time. We have found them to be very useful and our students have enjoyed the lectures contained in them. We have copied them on our college tapes."

Z. Odumbe - 8/8/71

"I received the Basic Concepts I and II that you did send me and I must greatly thank you for this. I find the two books unreservedly useful."

You will accurately learn that I have skipped some parts of the assignment or an assignment. By this I mean that I have to think harder in working those that I find a bit trying; the ones I find easier I write out and send."

D. Muhindi - May 1971

"Thanks for coming to see us and for being kind to show us some films. Our students raised some good comments on the films. The work on Transformation Geometry is very interesting. Next week I begin doing my next assignment on this work; and may I have the rest of the assignments because I have gone through the first eight assignments on number base and fractions have enriched my understanding greatly."

24/4/71 - "Enclosed please find assignments 2, 3, 4, and I feel that these assignments are improving my mathematical understanding. For example, I never took the trouble of knowing how zero came into being, but by reading my text I now know it. Thanks."

Sister Mora - 1/5/71

"I wish I could do all assignments in time but pressure from work I'm asked to do takes up most of my time. I hope you do accept my work even if it is late."

Brother Leo - April 19

"I have read the texts thoroughly though and did find a few approaches to topics which had not occurred to me to use. If you insist I shall send in assignments 1-8 but I shall consider doing so a complete waste of my time. I have been teaching this material for some years now and can do the answers without referring to the Texts."

(We regret to announce that Brother Leo was killed in a car accident just before Christmas.)

S. Bakhda - June

"You may be interested to know that I lectured on the New Maths course Mr. Chibudu held in Mombasa for the Standard I teachers."

G. Kiambi - 22/2/71

"I shall be the happiest man to see you here. May I thank you again for the trouble you are taking to bring us, especially myself, up to date with the modern maths."

Kiambi - 15/2/71

"Meantime may I express my gratitude for the help I am receiving from you. The December Institute, if I may say, has helped me a great deal to direct my students on the right direction as far as modern mathematics are concerned. May I thank you very much."

M. G. Kathutho, Kagumo - 26/1

"I regret to say that I have not been able to submit my assignments in time. Three problems had handicapped me since December 19, 1970.

1. My health has been failing.
2. The pressure of work in my college both administrative and professional.
3. Lack of Basic Concepts, Vol. I (Green) and II (Red)."

NOTE: A considerable amount of feedback has since become available through the questionnaires recently completed by participants in both Kenya and Ethiopia.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

Report for October 1971

Professor Roy Dubisch

October 1 - 12

Discussions with Joanou on several occasions. Move to offices near Mexico Square. Work on writing team comments on Fundamental Concepts and then a thorough reading of my own, making notes for revision and teacher's guide and preparing an errata sheet. Talked to Ato Ayalew (General Manager of Curriculum and Mass Media) who had been on leave when I arrived. Graded 12 correspondence lessons.

On October 7 drove to Debre Berhan with Ayalew, Joanou, and Makonnen to visit the TTI there. Briefed staff on Fundamental Concepts and the EARMP program in general and sat in on one class.

On October 8 visited Tadege at the Haile Selassie I TTI in Addis and met Dr. Lulseged, the principal. Unfortunately, classes had not yet begun. Dr. Lulseged offered me complete cooperation in anything I might want to do there.

October 12 - 23

Loop trip to Asmara visiting schools, supervisors and teachers in Dessie, Mekale, Asmara, Gondar, and Bahr Dar.

Two things need to be emphasized in connection with this trip:

- 1) It was intended more as an orientation trip for me than as a service to teachers and supervisors and
- 2) My reactions are based on very limited observations and my views may change somewhat on the basis of further observation.

First of all, due to transport problems my original schedule was disrupted and I could only manage to be in Makele and Debre Markos on Saturdays when there was only a half working day and no schools open.

After meeting the Provincial Officers in Mekale who had been expecting me on Friday (and had already been unhappy with a too brief visit by Fitzgerald), I concluded that it was best to re-schedule a visit there and to Debre Markos (but by plane this time - cheaper, quicker, and easier!) At this the P.O. brightened up considerably, and we talked pleasantly for an hour or so.

October 13 To Kombolcha (near Dessie)

October 14

In Dessie, the Director General was in Addis. I met with his assistant, Ato Aklilu and our three supervisor participants, Mohammed Uessuf, Shifarew Habtemariam, and Ayalew Hailu. These men had worked well with teachers in constructing various teaching aids and I found

the classrooms I visited well supplied with these. (This was not true anywhere else - even objects to count were scarce.)

I visited math classes in four different schools from Grades 1 - 7 and did discovery type demonstrations in a 3rd grade class and a 7th grade. The supervisors accompanied me on my visits and I commented to them on which I saw and did. At 4 p.m. I talked to the math teachers of the area about the new Ethiopian primary math program. (The first grade texts had not yet arrived.)

The three supervisors have participated from poorly to moderately well in the correspondence course. They complained about their quality (with which I was forced to agree.) Here, and elsewhere, I had no questions about any assignment partly, I suppose because Fitzgerald had answered early queries and partly because in grading the more recent ones, I have been careful to make detailed comments - something I'm sure Fitzgerald just didn't have time for last year. (Several supervisors commented to me on my detailed remarks.)

October 15 To Mekale

October 16

Brief visit in Mekale with Ato Berhanu as previously described and then on to Asmara.

October 17

Sunday. A real day of rest.

October 18

Met with Director-General Gebre Hiwot Rede and supervisors Nigate Tamiri (participant) Girma Araya, and Abdukader Ahmed. After calling briefly at the TTI and arranging for a visit next morning we visited classes in three schools where, again, I did a lesson in a 3rd grade class (comments on these visits later). No 1st grade classes in Asmara for 1964 E.C.!

October 19

Visited two TTI classes in the morning one 1st year and one 2nd. The second year class taught by Institute participant K.Q. Krishnan Namirar was rather apathetically revising the number line. Towards the end I tried getting their interest by asking some questions hopefully leading up to density and incompleteness of the rational number line midway between a and b was a/b - and these were 2nd year students with a 10th grade background. The 1st year class taught by Institute participant Gebre Matios Gessesse, was much better with the teacher giving an excellent description of pre-number ideas of children.

To Axum in the afternoon.

October 20 To Gondar

October 21

Met with Director General Ato Tesfaye Reda and Supervisors Wondayehou Kassa, Yayenishet W. Rafael, and Ashagrie Tadesse (all Institute participants). Also met Ato Negash Gebre, the Gojam Director General in Gondar and made arrangements to delay my visit to Debre Markos.

The first grade books had arrived in Gondar (but without the teacher's guide) and I found the supervisors worried about the teacher's ability to handle the material. So I spent much of the morning going over the book with them.

Visited one school in the morning and one in the afternoon and wound up with a discussion over a beer with the supervisors.

October 22

To Bahr Dar and a meeting with Supervisor Kassa Zewdu (Institute participant) and visited two schools.

CONCLUSIONS

1. Considering the physical conditions, 50-80 children in a classroom, sometimes with no chairs or desks, etc., I think that the children and their teachers are doing remarkably well. The children, in the whole, are attentive and responsive and the teachers are obviously trying to do a good job.

2. The teaching I saw ranged from good to poor - as might be expected. Nowhere, however, did I find a single instance of a child being led to discover for himself something about mathematics. (But, I remind you that my sample was small and not all topics lend themselves to discovery.) My own attempts found the children puzzled over the idea of being asked to find something on their own - they wanted to be told what to do.

3. I think my trip has given me a basis for some very definite suggestions for improving the EARMP but I want to discuss my ideas with Fitzgerald and others before submitting them (which I hope to do shortly after my return from Nairobi on November 6).

October 24 - 31

Discussed trip with several people. Much time spent getting permanent license plates for car. Incredible complications! Checked stencils and made drawings for solutions to selected exercises in Fundamental Concepts. Graded eleven correspondence assignments. Wrote this report. Left for Nairobi on October 31 after obtaining, with some labor, an exit-entry visa.

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

Report of

The WARMP Editorial/Evaluation Program

October 1971 - March 1972

by

Roger R. Hartman, Maths Editor

1. CLASSROOM TRIALS AND EVALUATION TASKS

(a) Preparation of Stencils for Trial Materials

Manuscripts from the first WARMP Workshop were transferred onto stencils. Unless errors were found, no changes were made in the authors' texts. Two typists were hired in Accra. One typed the Secondary One text and the other typed the Teacher Training text. The editor drew the charts and diagrams onto the stencils. Since the Primary One and Two texts are largely visual or use a large bold print most pages were copied onto stencils electronically (Gestefax 200). The remaining pages were hand copied onto ordinary stencils. Virtually all these stencils were completed by the end of November.

(b) Printing of Materials

This has been the biggest bottleneck of the classroom trials. In the program design, WARMP was to have used duplicating equipment from the University of Cape Coast. In practice we have found that this is all but an unworkable situation. First, university equipment is in heavy use during working hours. Thus, most of our work has been done after 5:00 p.m. or on weekends. Second, there is a bureaucracy to fight to obtain permission for machine use and to locate the key for entrance to the printing room. Those in charge were often not present and their subordinates refused to assume responsibility. Third, the various faculties were reluctant to loan WARMP their machines. There were fears about breakdown and questions as trivial as whether we were willing to buy detergents to clean up. Indeed, WARMP has had expenditures for repair even though breakdown is cumulative and not necessarily the fault of our using the machine at the particular time it broke down.

In our attempt to print the pupil pages, WARMP has used the two mimeograph machines at the Faculty of Education, one from the University Chapel, one from a nearby high school, one from the Science Faculty, two from the Administration building, one from the Curriculum Research and Development Unit in Accra, one from a training college, and one from the University of Science and Technology at Kumasi. As a result we have printed the materials to keep our teachers supplied, but, needless to say the entire operation has been a headache.

Had WARMP had its own equipment the entire printing could have been finished in four to six weeks. There are no rental agencies for equipment of this type and no copying services to contract for this job. Thus, it is in the interest of the program to purchase its own duplicating machine and its own copying machine. (The copying machine used at Cape Coast is not in satisfactory condition; it copied both sides of an Entebbe Primary pupil page. Hence we were forced to trace onto another sheet with one side blank and then copy the traced page.) However, in spite of these conditions pages for the Teacher Training Text were completed by mid-December, the Secondary One Text by mid-February. Production for the Primary One and Primary Two texts has been temporarily suspended after approximately 100 pages each for reasons discussed later.

(c) Selection of Schools

The first schools selected were in Liberia; selection criteria were left to Mr. J. L. Bettie, the Liberian trainee evaluator. Although Liberia operates on a March to December school year, it was felt that the Primary One and Two geometry units could still be tested during the 1971 school year. The schools next selected were those in Ghana. After meeting with Ministry of Education officials, it was decided that most of the schools be in the Cape Coast vicinity since supervision of the trials would be in easy reach of the evaluator designate, Mr. Minta. One four-year teacher training college was selected (Somanye) and one two-year post-secondary (Komenda). As for Sierra Leone, the secondary schools were selected by Professor A. Williams in cooperation with two workshop writer-teachers, Mrs. Palmer and Mr. Thomas. Arrangements for the primary and teacher training trials were made by the editor and WARMP writer-teachers during the editor's visit to Sierra Leone (November 12-November 24, 1971). The participating schools are described in the chart below.

Liberia's 1972 school year began last March. As yet we have no information about the class trials there. Materials were left for use in two streams at Kakata Rural Teacher Training Institute; these are to be taught by a WARMP writer and WARMP institute participant. Also, materials have been sent for use in grade eight (the equivalent of Form One) designated for use in Monrovia in a school selected by Mr. Bettie. Moreover, primary materials are there to re-supply C. D. B. King Elementary School and the Laboratory School at Zorzor. These are sufficient for the first third of the school year. A subsequent shipment has been sent with a final one to follow.

(d) Supply

There has been a delay in supplying the classes with WARMP materials. This is a consequence of the printing delay. Also, some shipments have been caught in customs. In one instance a shipment was sent to Sierra Leone c/o Mr. Alexander the WARMP educator, at the U. S. Embassy. Upon visiting Sierra Leone last November the editor discovered that the embassy there does not clear for AID personnel. It took two days to locate and clear a shipment; this was hand carried to the schools. Another shipment was located but never cleared. Professor Williams has agreed to have subsequent shipments for Freetown cleared through Fourah Bay College. On the same visit similar arrangements were made through Bo Gov't Secondary School and the Bo Teacher Training

SCHOOLS PARTICIPATING IN WARMF CLASSROOM TRIALS

School	Location	Level	Teacher Background
Philip Quaake Elementary	Cape Coast, Ghana	Primary One	Trained in Modern Mathematics by Ghana's Math Organizers
Philip Quaake Elementary	Cape Coast, Ghana	Primary Two	Some but not much experience in modern math
Antim Community	Cape Coast, Ghana	Primary One	Trained in modern math
Antim Community	Cape Coast, Ghana	Primary Two	Trained in modern math
Antim Community School	Cape Coast, Ghana	Secondary One	University graduate in mathematics; WARMF writer; MAG* editor
Aggrey Memorial Secondary	Cape Coast, Ghana	Secondary One	Experienced teacher; some university work; writer for MAG
Komenda College	Komenda, Ghana	TT - 2 year	Trained by WARMF institutes; experienced
Mt. Mary College	Somanye, Ghana	TT - 4 year	Graduate in math from Advanced Teacher Training College
Bo District Council School	Bo, Sierra Leone	Primary One	Unknown
Bo District Council School	Bo, Sierra Leone	Primary Two	Unknown
Fatah Rahman Elementary	Freetown, Sierra Leone	Primary One	Unknown; under supervision of WARMF writer
Fatah Rahman Elementary	Freetown, Sierra Leone	Primary Two	Unknown; under supervision of WARMF writer
Albert Academy	Freetown, Sierra Leone	Secondary One (2 streams)	Experience; some university work; WARMF writer
Bo Gov't. Secondary School	Bo, Sierra Leone	Secondary One (2 streams)	Two teachers: a) experienced university graduate and WARMF writer; b) first year U. S. Peace Corps Volunteer
Bo Teacher Training College	Bo, Sierra Leone	TT - 3 year	University math graduate; participant at WARMF institutes and WARMF writer
Catholic Training College	Bo, Sierra Leone	TT - 3 year	University math graduate; participant at WARMF institutes
C. D. B. King School	Monrovia, Liberia	Primary One	Some modern math background - extent unknown
C. D. B. King	Monrovia, Liberia	Primary Two	Unknown
Zorzor T. T. I. Lab School	Zorzor, Liberia	Primary One	Very little modern math training; supervised by WARMF writer
Zorzor T. T. I. Lab School	Zorzor, Liberia	Primary Two	Not teaching WARMF as originally planned since no suitable teacher was found

*Mathematical Association of Ghana

College. Somewhat similarly, a shipment sent to Mr. Bettie in September through the Department of Education was still in harbor last January. Dr. Banks-Henries has agreed to clear future shipments. Customs clearance therefore have hindered the program in the past. We trust this will not re-occur.

In Ghana, supplying the schools has presented no real problem. We've simply carried our materials to the schools.

(e) Feedback from the Trials

At the writing workshop we prepared chapter report forms adapted from those used by the Entebbe program. Although these forms were simplified, we have found that the teachers do not respond to them. It takes a visit by someone, preferably an evaluator, to make the personal contact and collect the data.

The Ghana evaluator, Mr. Minta, was not released to WARMP until late February. His release is part time but that time is sufficient for him to attend to the program responsibilities. On March 7 a meeting was held at Cape Coast to plan his schedule. Since then Mr. Minta has visited the Cape Coast schools (March 10), located Accra schools teaching the Entebbe Primary Three and Four (March 27 and 28) and has made preliminary arrangements for testing them in May. During the present term break, he is to begin work on test analysis of the WARMP institute participants. So we have a very capable evaluator and an evaluation program working in Ghana.

Prior to Mr. Minta's appointment the editor assumed the responsibility of visiting the schools for collecting data. These visits were irregular and insufficient in number owing to other responsibilities. Usually they coincided with the delivery of additional materials to the teachers. Nonetheless, between October and March two visits had been made to both primary schools in Ghana, three visits to both secondary schools, two to Somanye and three to Komenda. Thus, we have a relatively good picture of the results here.

Some general outcomes of the classroom trials follow:

Ghana

Primary Text: The guides are still too verbose.

The teachers have been using WARMP materials as enrichment. There's still a problem in experimenting because teachers feel responsible to the ministry approved text.

Teachers have not given the pupil pages to the pupils as they are in sheet form and subject to creating discipline problems. (Hence the printing has been suspended.)

The teachers would like a neater page format for the pupil pages.

Secondary Text: The written part of the text (theory) is excellent.

More activities should be included (teachers have made specific suggestions).

Suggestions have been received for additional types of problems.

Teacher Training Text: One chapter should be cut in length and incorporated with another chapter.

The chapters on geometry should be sequenced differently and expanded in sections.

Suggestions have been made for rewording portions of the body of the text.

Numerous suggestions have been made for additional problems and their sequencing.

Liberia

In Liberia there has been little to evaluate. On the editor's first visit there he was unable to contact the teacher at C. D. B. King school on two occasions. In Zorzor it was found that the teacher was teaching the Primary Two material to Primary One students and that he was using the Teachers' Handbook instead of the Teachers' Guide. He was on the right track when the editor left. No evaluation forms have been received. Again Liberia is to participate at all levels, primary, secondary, and teacher training with the beginning of this new school year. The responsibility for feedback will be with the evaluator trainee.

Sierra Leone

No editor, evaluator, or editor/evaluator personnel has been released to WARMP by Sierra Leone. On the editor's visit there last November the majority of his time was spent in locating schools and transporting materials to them. Also, it was too early in the school year to receive many comments from the teachers. Unfortunately responsibilities in Ghana have been too heavy to allow a visit since then.

This is a feeling, but I suspect that the trials in Sierra Leone are near collapse. The materials have been shipped late; we've had no contact with the teachers at the primary and secondary levels. Only one evaluation form has been returned and a letter received last month indicated that a shipment sent last October had not yet been received. Without an evaluator there, there is no continuous link with our headquarters. It's impossible for the editor to make monthly visits. The administrator and the math educators have other

responsibilities. Any data we receive must come from the teachers themselves and teachers simply do not respond to the impersonality of our evaluation forms.

(f) Feedback from the Maths Educators

Both Mr. Norris and Mr. Alexander have been helpful in assisting with the pre-editing of the teacher training texts. They used the manuscript as the basis for their instruction at the third and fourth institutes. Here for a total of four weeks they received comments and criticisms of the material from many of those who expect to be teaching from it upon its publication. These suggestions were edited into a single copy which will serve as a guide for final copy preparation.

(g) Feedback from CRDU

The Curriculum Research and Development Unit (CRDU) of Ghana's Ministry of Education has a special interest in Ghana's teacher training colleges. They have assisted in submitting their reactions to the Teacher Training text. Much gratitude is due them, Mr. E. B. Dogbe, now WARMP Editor - Ghana, Dr. Robert Yawin and Mr. John Williamson.

2. THE EDITORIAL PROGRAM

(a) Pre-Editing

All materials have been pre-edited to some degree by the writing chairmen. The second stage was done by the editor himself as stencils were being prepared to print the classroom trial edition. The third and final stage is not yet in full swing. This involves the analysis of data from the trials and its incorporation into the body of the text as it is to be set out for print. Not as much time as desired has been devoted to the pre-editing. As explained before, there have been other priorities on the editor's time.

(b) Editor Trainees

Before the first workshop, Mr. William Momolu was assigned to WARMP as Liberia's editor. His background is not strong in mathematics, although he has done some course work in modern mathematics. He has taught and has experience in educational administration. It is hoped that his training will prepare him for editorial work in mathematics at the elementary school level and possibly in other primary subjects as well.

He has met with the editor twice since the workshop in November and again in January. Discussions were about the program in general. Training is being conducted by correspondence and we are planning to work together a week before the second workshop.

In February, Mr. E. B. Dogbe was released on a part-time basis from CRDU. He is a university mathematics graduate with experience in both teaching and curriculum development. His location at CRDU is ideal for continued editorial work after WARMP phases out. Since his release, we have met regularly and

have prepared our schedule for future editing; he is a great asset to the program.

Sierra Leone has not released an editor to WARMP. I have had several discussions with Mr. M. A. J. Bockarie about the position; however, no formal training can commence without Ministry of Education approval.

An editorial committee is needed to work on the primary guides. The guides have been found to be too verbose inspite of the cuts made by the primary writing group. The committee has been approved in principal by the program administrator although a date has not yet been scheduled for their meeting. Ideally the committee will consist of Mr. Nyame, Mr. Bempong, Mr. Minta, Mr. Dogbe, and Mr. Hartman; ideally they can meet near the end of April or the first of May at WARMP-Accra.

(c) Preparation of Camera Ready Copy

At last, work has begun on this task. Two weeks ago Primary One layout began and to date about one-third of the text is ready to go to the printers. Improvements have been made in the art work; the number sentence pages will be re-set in several cases to give the text a neater appearance. Unit and page numbering will bear standardized print and space layout unlike the random design of the original Entebbe text.

The design equipment supplied to the editor by E. D. C. was quite well planned. However, it has been necessary to purchase a few items more and to order a few from E. D. C.

Work on the Teacher Training text has also begun although page layout will not start until we have our typists. The program administrator has made the contacts. Should the financial details be settled, they can begin work in the last week of April. Since all manuscripts must be retyped (instead of the type, cut and paste procedure originally planned), at least one full-time typist is needed. Others will be needed on a part-time basis as soon as the guides and secondary text are ready to be set out.

3. GENERAL REMARKS

(a) Non-Editorial Tasks

WARMP is a team effort and will succeed or fail as a team. From time to time, therefore, it has been necessary to assist the math educators and the administrator with their jobs. This has been done in a variety of ways ranging from providing transport for Mr. Alexander to his colleges to delivering plane tickets for the institute when the currency devalued here and tickets had to be re-written at the last minute. This does add up to a good bit of time, not a part of the editor's job but certainly the responsibility of one who wants a successful program. Conversely, the other members of our team assist the editor in several ways. We work together quite well.

(b) WARMP/Accra

It is hoped that the editorial and program headquarters can be moved to Accra, based on discussions held at Kakata, last January. Support facilities are more readily available in Accra than in Cape Coast. Competent typists are a major problem; they are not to be found in sufficient number either at the University or Cape Coast town. Much time has been spent in searching for an appropriate residence-office. Both the editorial work, reproduction of materials and training of Mr. Dogbe will be greatly facilitated by moving to Accra.

(c) Equipment

The remainder of February has been spent in investigating office equipment before making a purchase. This is the equipment decided by the Management Committee to be necessary for the functioning of the classroom trials and the preparation of camera ready copy. Although typewriters, copying machine, and a duplicating unit have not yet been bought we have found the ones that we think can best serve us.

(d) Last of All

An optimistic note may be best to end this report. I have a personal feeling that the program turned the corner with the release of Mr. Dogbe and Mr. Minta. It is a relief to have their assistance after carrying the burden by myself for months. This coincided with the last of the classroom trials printing and now I am finally editing. Maybe I'm breaking into the job. Anyhow, I have the feeling that things will be easier in the months ahead.

Report on Visits to Liberia and Sierra Leone Participants
by John W. Alexander, Maths Educator

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

September 1971 - January 1972

Sierra Leone

I was late coming back from the U.S. because of travel arrangements. Therefore, my visits to participants in Freetown did not begin until October 3. From that time to October 8, I worked with Miss Tumaku, Miss Tucker and Miss Taylor. All of these ladies have a heavy teaching schedule, therefore I met each of them on different afternoons to discuss their individual problems. Both Miss Tumako and Miss Cummings were having a great deal of trouble with the Correspondence course. Miss Taylor has been slow about sending her assignments in also. But, her reason is different. She has just been very busy. Her average is 65.3% as opposed to Miss Tumako who has 39.2% and Miss Cummings who has 49%.

I have devoted a great deal of time in extra sessions with these three participants. Hopefully their scores will improve.

I was scheduled to visit Mr. E.S. Tucker, who was supposed to be teaching at St. Theresa's Primary School in Freetown, however, he had been transferred to a school in Pujehun. Neither he nor the ministry informed me of his transfer.

From the 11 to the 14 of October I visited with Mr. Ndanema in Moyamba and Mr. Gbondo at Njala. Mr. Ndanema had not been turning in assignments. So, I wanted to see if he was having a great deal of difficulty. As it turned out, it was not the difficulty of the assignments, it was the simple fact that he was not receiving them. Some mix up in the mails has not allowed him to receive assignments 2 through 12. The Administrator has been informed and hopefully this situation will be rectified.

Mr. Gbondo, a fine teacher, is doing reasonably well with the Correspondence course. His average at this point is 83.5%. He has also turned in the assignments with regularity.

Mr. Gbondo had his students (class 3) doing interesting games with groups of sticks. Most of the students seemed to understand the concept of set, and were able to count to 10. They could also put the set in natural order.

I was back in Freetown from the 15th to the 20th. I visited with Mrs. Macauley and Mr. Manu. I had trouble finding Mr. Manu at first, because he too had been transferred. I finally found him at St. Joseph's School, on High Street.

Mrs. Macauley is trying very hard, however, her background in mathematics is quite poor. Further, she was headteacher at her school and there-

fore was busy with administrative details. Her average was just 59.7%. But, I do expect her to improve.

Mr. Manu has turned in only one assignment. He said that he has been busy studying for an examination. He promised that he would get to work on the assignments as soon as the examination was over. I neglected to ask when the examination was over, however, I would wait to see what his response was.

I next visited Mr. Dugba and Mr. Young in Makeni. The Correspondence Course was too elementary for Mr. Dugba, who teaches maths-methods at St. Augustine's Training College. He therefore has turned in only two assignments. He did quite well on both of them. I have given him (at the last institute) secondary C Three and C Four to do some extra work on his own; hopefully this would be more challenging to him. All of the people in the course who were advanced like Mr. Dugba were given these books.

Mr. Young who was also a headteacher at a Primary School has a poor background in maths and like Mrs. Macauley has a great deal of administrative work to do. He therefore was slow turning in assignments and has a 73.0% for four assignments to date. I worked with him for three afternoons trying to give him background for the assignment that he was behind on.

From October 25 to the 28 I was in the Kono District with Mr. Aruna, Mr. Massaquoi and Mr. Chaulker. They were all headmasters of Primary schools. Mr. Massaquoi and Mr. Aruna have been turning assignments rather slowly; Mr. Chaulker has turned in none. They all have weak backgrounds in mathematics plus their duties as headmaster take up a great deal of their time.

I worked with the three of them each day from 9 to 12 noon and 2 to 4:00 P.M. We went over all the back assignments, and I tried to give them some preparation for future work. Mr. Massaquoi has turned in 4 assignments (68.3%) and Mr. Aruna has turned in 5 (72.0%).

I travelled next to Bo, where one of the best students, Mr. Bockarie was teaching. Mr. Harding a headmaster at one of the Primary schools was also in Bo. Both Mr. Bockarie and Mr. Harding have turned in most of the assignments. Mr. Bockarie has an average of 93.9%, while Mr. Harding has an average of 79.7%. Since both of these participants are doing reasonably well in the Correspondence Course I gave them some more advanced problems and ideas to work on in afternoon sessions. For example, I asked them to calculate the probability of 12 coins tossed in the air at once will all land heads. We also explored the classical birthday matching problem; i.e., given 25 people what was the probability that women in the group have the same birthday.

Miss Rosaline Hanson, a recent graduate of Njala, and now a tutor at Catholic Teacher Training College, joined us for these sessions. She has now become a participant of WARMP.

On the 3rd and 4th of November, I visited Mr. G.S. Komeh-Navo. He was another headteacher and has been turning in assignments very slowly; the ones he has turned in have not been good at all. His scores are Assn. 1: 57%, Assn. 3: 60%, Assn. 5: 0%, Assn. 6: 53%. This was the last assignment I have received. He too is busy with school duties, but his mathematics background is seriously deficient.

Liberia

My original schedule called for me to visit Mr. Johnson in Loffa County and Mr. Snoh at Kakata. However, we held a 4-day institute in Monrovia from the 8th to the 11th. This was to build up the number of participants from Liberia (See report on 4-day Institute).

From the 11th to the 16th. I visited Mr. Dennis and Mr. Paasewe. Mr. Bettie has not turned in any assignment, however, this is probably because the material is too elementary for him. He has been working in Modern Maths for some years now and probably does not need this course. Mr. Dennis, Mr. Paasewe, Mr. Kimber and Mr. Elliott have turned in about half the assignments. Mr. Dennis who works for the curriculum Centre has the highest average, i.e., 82.2%. He has trouble with some concepts, but could do better if he put in the study. Mrs. Thompson does not understand mathematics at all. I am not sure she even tries. She has turned in only one assignment, and only scored 63% on that one.

Since I wanted to be sure to visit Mr. Snoh at the Training College in Kakata I did not go to Robertsport to visit Mr. Diggs. Mr. Diggs has not responded to the Correspondence Course probably because he knows most of the material. He has also done a great deal of the modern maths and also trained other teachers in his area.

However Mr. Snoh is at a training college, and this is the main focus of WARMP. Mr. Snoh was no where to be found.

I travelled on up-county and visited with Dr. John Gay at Cuttington College and talked to him about Mathematics education in Liberia. I stopped in Loffa County, but Mr. Johnson had also travelled. It seems that the Fourth Institute changed the schedule to a point that made it difficult for people to re-adjust when I did not come as originally scheduled. I will make sure I see the people that I missed on my next trip to Liberia in April.

I was originally scheduled to see Mr. Ngebeh in Lungi but he is now attending Njala. I therefore travelled to Lunsar on November 23 to visit Mr. Kanue; he is doing reasonably well with the course. He is a headmaster with all the problems that the others have but he gets his assignments in on time and has a 70% average.

I spent a week November 25 to 29 in Freetown grading papers and then took off for Accra to help John Norris prepare for the Third Institute. I returned to Freetown December 28. I then began preparing for the Fourth Institute to be held at Kakata, Liberia. This institute ran from January 10

to January 23; I was back in Freetown by the 26th. I stayed a couple of days in Monrovia to talk with Dr. Henries. I did not however, get the opportunity to see her. I am to start visits to Ghanaian participants on the first of February.

John W. Alexander, Jr.
Mathematics Educator

Report on Visits to Ghanaian Participants
by John T. Norris, Maths Educator

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

October - December, 1971

Soon after the opening of the training colleges in October it was felt that a survey needed to be made to ascertain changes in maths staffs, level of modern mathematics teaching and which colleges could best benefit from intensive visits. While discussing these plans with the CRDU (Curriculum Research and Development Unit of the Ministry of Education, Accra), it was apparent that they too wished this type of information. Therefore during the week of October 11 to 15, I, Mr. Bob Yawin and Mr. Jack Williamson both of CRDU, made trips which included eighteen training colleges in the Volta and Eastern Regions of Ghana. This proved very useful because a number of the WARMP participants had changed schools, or had left teaching (mainly for further study) and a number of well qualified new maths tutors had taken up positions in the colleges involved in the WARMP.

A report of the amount of modern mathematics being taught was drawn up along with the names of those tutors teaching in the various colleges. Although no detailed study has been made it appears that the amount of modern mathematics being taught in those training colleges involved in the WARMP is far more wide-spread than in those colleges not yet involved. Furthermore every college in the WARMP has made some decision to teach modern mathematics. All of these decisions for this change in teaching have come from the college administrations and teaching staffs who have shown real interest and desire to move as rapidly as possible. In fact it appears that it is the lack of adequate textbooks which is hindering a total and immediate switch to modern mathematics teaching. The National Teacher Training Council has already approved a new modern mathematics syllabus for the training colleges.

With this information at hand a visiting schedule was worked out which tried to include those colleges that would benefit most, since not all colleges could be visited before the Third Institute.

During the Week of October 25 to October 31, three colleges were visited. Three days were spent at Abetifi, a college that is moving quite rapidly towards a complete modern maths program.

Mr. B.K. Addo has been trying to start a maths club and find a room which can be used as a materials centre and maths lab. Both Mr. Addo and Mr. Ansanyi were observed and their level of teaching was found to be excellent. This is very hopeful since Abetifi seems destined to remain the only training college in its geographic area. One day was spent at Obo but no observation was done since the college is now almost completely phased out and only one class was in session. Mr. Ayeh shows interest in modern mathematics but does not have the background necessary to teach it adequately. The other training college visited was Nkwatia where Mr. Oteng and Mr. Obuobi as well as a PCV, Miss Eastland, are doing a good job introducing modern mathematics. However this college is also phasing out and this year has no first-year class.

The week of November 1 to November 4 was spent at the Post-Secondary training college at Akropong. The staff composed of Mr. Odoom, Mr. Boateng,

and Mr. Koranteng, are all excellent teachers and each was observed three or four times. It might be noted that Mr. Twumasi is also an excellent tutor but he now teaches science exclusively. In working with Mr. Boateng different seating arrangements were tried with several of his classes. The chief objections to group work dealt with the physical inconvenience of moving the heavy desks but since he was blessed with classes of about 25 it proved to work out fairly well. Mr. Odoom is one of the most capable of all the WARMP participants in terms of his mathematical understanding. His classroom manner is also good but not particularly innovative. We discussed possible ways of reorganizing the class into smaller groups and have the students "doing" more mathematics. Mr. Koranteng was observed to be an excellent teacher but with a slight tendency to slide over some of the more sub mathematical topics. In the afternoon discussions held with all three tutors we discussed several possible geometry problems involving bottle caps that could be used in the classroom for explorations in mathematics.

The week of November 6 to 14 was spent in Liberia with Mr. Alexander conducting a four-day institute for the Department of Education.

The week of November 16 to 19 was spent in Cape Coast grading papers and preparing materials for the Third Institute.

The week of November 22 to November 26 was spent in Jasikan Training College, Here again is a very strong mathematics staff with Mr. Asare, Mr. Asante, Mr. Yaya and Miss Aggor. In addition, Mr. Djamboe is now in charge of the mathematics at the demonstration school attached to the college. The students were all out on teaching practice for this week and the students of the tutors could be observed teaching. Unfortunately most teaching was at the upper primary and middle school levels so very little modern mathematics was observed. However there seemed to be an honest attempt on the part of the students to use physical object when demonstrating mathematical ideas and also a stress on the "whys" rather than blind manipulation, at one school where a student was teaching the concept of equivalence and equality. Unfortunately the student didn't understand the difference herself. After discussing the lesson with her later I was talked into doing an improvised lesson with the same class before they left for the day. Since my American accent is difficult for the third grade children to understand I had the help of the student and the regular teacher to translate from American English into Ghanaian English or at times the vernacular. Actually most of the lesson was spent on the concepts of one-more-than and one-to-one matching because without these concepts equivalence and equality didn't make any sense.

Perhaps the most important thing that came out of the lesson was the fact that everybody, especially myself were having a good time doing mathematics. In fact several of the other student teachers (who had gathered at the windows) were overheard by a tutor to say that now they saw what the difference was between equal and equivalent sets.

November 29 to December 3 was spent at Mt. Mary Training College where the new WARMP materials are being tried out. Mr. Lomotey, Mr. E.L. Asare and I spent most of the time discussing the suitability of the texts and additional topics of interest. In fact Mr. Asare found an ingenious way to apparently trisect an angle. It took a careful use of the cosine law to convince him that in fact he had not done it.

Unfortunately Mr. Nyineku could not be with us for most of the sessions because he was also teaching in the afternoon at another school. Also one day was spent at Krobo Women's Training College with Mr. C.N. Kissiedu whom I met for the first time. He is the brother of the maths tutor teaching at Aburi Women's Training College and had been trained in modern mathematics at the advanced teacher Training College. From his work later at the Third Institute he appears to be well versed in the modern approach.

Upon returning to Cape Coast on December 3, it became apparent in talks with the WARMP editor, Mr. Hartman, that the necessary copies of the teacher training text needed for the Third Institute would not be ready unless another Gestetner machine was found. The Physics department was contacted and most of the week-end was spent running stencils. This mad pace continued for the next few days until the start of the Third Institute in Abetifi December 9-23.

Although a separate report has been written on the Third Institute it might be noted that the schedule was extremely rigorous. In some cases there were eight hours of classes with an optional one in the evening. It was necessary to have this pace for us to go through two years worth of teacher training materials in just two weeks. However the attendance and interest shown by the participants was exceptional. It was very gratifying to me to see this level of interest and enthusiasm. If this level of enthusiasm can be encouraged and sustained there is a bright future for modern mathematics in the training colleges in Ghana.

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

Ghana - Correspondence Grades for 1971

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Abbiw, M. K.	97*		50		100	80																		
2. Annan, E. N. Y.																								
3. Ameyaw, J. O.	90		67	57	83																			
4. Agbo, W. K.					83																			
5. Asantey, E. K.	100	81	80	93	100	97																		
6. Alcbuia, K. A.	95	85	67	87	83	100	63																	
7. Addo, B. K.	95	69	76	97	83	93	70																	
8. Ansanvi, G. K.	100																							
9. Avensu, F. K.	95	89	86	67	100		47																	
10. Asare, C. W. K.	95	89	81	90	100	99	70		93		100													
12. Agyare, E. A.	100	89	91	90	100	93	50																	
13. Alordzi-Sosa, K.	90	89	100	93	83	90																		
14. Akkmo, S. O.				Left teaching																				
15. Afful, E. (Mrs.)	80	90																						
16. Asare-Afful, K.	77	87	70	93	63	79	81																	
17. Appiah, G. K.																								
18. Ayeh, T. A.	90	85	81	83	67																			
19. Atitsogbi, E.B.K.	100	89																						
20. Ampofoh, H. O.	100	92	62	100	83	100	60		93		75	80	80											
21. Adjei, Kodwo	90	100	70	80	100	87	85																	
22. Ampah, Victor K.	100	97	70	80	100	86	100		100		95													
23. Ademadziku, C.M.	95	92	76	100	100																			
24. Offei-Awuku (Miss)	84	81	91	94	100						90													
25. Doe, A. Y.	100	85	100		99	93																		
26. Dor, E. D.	100	96	95	100	100	90	97		100		95	85	90	95	100									
27. Boateng, S. G.	100	100	67	93	100																			
28. Djang, S. K.	79	81	91	63	100	79	70																	
29. Dzata, M. K.	90	81	100		100																			
30. Damenor, M. N.	95	72	86		67	90	50																	
31. Dzila, P. A.																								
32. Gyan-Mante, V.	95	85	81	9.	100																			
33. Dame, Paul	95	81	67	87	100	100	50		100		95	70												
34. Djamboe, P. C.	100		76																					
35. Ennin, J. K.	95	89	81	77	100																			
36. Sis. R. MacDonald	100	100	100	100	100																			

Ghana - Correspondence Grades for 1971

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
37. Martinson, E.L.A.	90	94	70	100	100	100	85																	
38. Jamboe, H. A. K.	74																							
39. Mortagbe, S. D.																								
40. Ampong, E. D.	100		53				60																	
41. Kissiedu, C. N.	90	92	81	100	100	77			93		85	80												
42. Kata, E. K. K.	100																							
43. Kotei, L. N. A.	100	89																						
44. Frompong, E.																								
45. Nirumah, S.A.B.	84		38		83																			
46. Mensah, D. T.	84		38		83																			
47. Gerald de Lima	100	89																						
48. Kumi, W. E. K.	100	100	100	87	100	93	92		100	100														
49. Peter Amoh	83	90	70	87	36	72	97																	
50. Kofie, T. B. K.	97	100	80	87	100	86	93			92	100													
51. Micah, W. C.	90	77	100	100	68		94																	
52. Gamedcagbao, E.K.	95	92			83		50				100													
53. Gaisey, M. C.	100	92	86		83																			
54. Kpo. M. W.	100		67	67	50																			
55. Otteng, Jacob	90	96	86	93	93	60			97		100													
56. Osei, M. M.	90	96	100	93	83	90	36																	
57. Oduro, J. K.	100		76	57	67	50	43																	
58. Oguah, A. S.	97	90	90		84	100	100																	
59. Obuobi, G. D.	100	67	67	67	100	77	70																	
60. Odoom, D. N.	100	92	48	93	100	100	63				80	70	80											
61. Mensah, M. E. K.	90																							
62. Twumasi, M. A.	100																							
63. Benjamin Quansah	100	97	100	87	100	100	64																	
64. Lomotey, M. L.	95																							
65. Shadow, Ali	90	77	72	73	100	100																		
66. Sagoe, Ekow	97	86	60	100	68	86	85																	
67. Wemegah, A. K.																								
68. Wortordzor-Domi																								
69. Yanney, Victor																								
70. Yaadar, M. D.	84																							
71. Yartey, T. V.	60	91			67																			
72. Takpo, J. N.	95	96	95	97	83	83	80				95	95	95											
73. Arthur, G. F. K.	100	93	70	67	100	86	71			89														

Ghana - Correspondence Grades for 1971

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
74. Badu-Prah, P.A.K.	100	97	100		100																			
75. Aggor, Victoria	91	96	76	90	67	97	60		90															
76. Antoh, J. E.																								
77. Boateng-Ahenky																								
78. Agyei, E. B.																								
79. Owusu, R. (Mrs.)																								
80. Amoah, S. L.																								

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

Sierra Leone - Correspondence Grades for 1971

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Harding, M. K.	63	90	40	67					95	71	95													
2. Kombe-Kajue, A. M.																								
3. Spain-Young, D. W.	87	78	60	67																				
4. Tamaku, A. N. (Miss)		63	60	13	0																			
5. Cummings, M. (Miss)	57	33	80			51																		
6. Taylor, O. (Miss)	73	53	70	40	52																			
7. Dugba, T. M.					100	72																		
8. Manu, J. P.	77																							
9. Bockarie, M. A. J.		100	90	100	100	100	92																	
10. Koroma, A. P.																								
11. Ngebeh, J. A.	67		90	73	68																			
12. Ndanema, M. J.	70																							
13. Gbondo, S. J.	97	95	75	67		72	85			80	95													
14. Komeh-Navo, G. S.	57		90			53																		
15. Macauley, E. (Miss)	37	50	70	53	52	80																		
16. Kanu, E. S.	57	13	90	80		68	85		70	92														
17. Tucker, E. S.	70		70				43																	
18. Turner, K. T.																								
19. Hyde, E. P. (Miss)	73																							
20. Varkey, K. P.	90	100																						
21. Kehoe, N. (Sis)																								
22. Jordan, Dave																								
23. Caulker, D. H.																								
24. Aruna, T. B.	57	53	90		68																			
25. Massaquoi, M. B.	90	70	100	13																				
26. Kamara, A. M.	60	71	60	73	67	58	93																	
27. Kamara, A. B.																								
28. Descheynes, M.																								
29. Khalu, M. C. S.																								
30. Mr. Jacob	90																							
31. Mrs. Jacob	90	100																						

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

Liberia - Correspondence Grades for 1971

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Bettie, J. L.																								
2. Diggs, T. A.	83				68																			
3. Cleon, J. D.																								
4. Carr, G. T.																								
5. Dennis, J. B.	79	80	50		100	93	93																	
6. Flahn, G. F. S.					100																			
7. Elliott, M. H.	67	49	40	60	67	73																		
8. Kimber, C. V.	40	35	80	53	17		48		55	58														
9. Maximore, J. H.																								
10. Paasewe, A. M. D.	70	87	60		53	67	50																	
11. Johnson, W. M.																								
12. Thompson, D. V. (Mrs)	63																							
13. Sherman, K.																								
14. Yancy, M. (Mrs)																								
15. Snoh, T. B.	90	73	100																					

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

Ethiopian Supervisors - Correspondence Grades for 1971

	BASIC CONCEPTS															MOTION GEOMETRY			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2	3	4
1. Haile Michael W. Mariam												A	A	B	B				
2. Girma Bette	B	A	A									A	A	A	B+				
3. Boshera Tolesa								No				A	A	B	A+				
4. Makonnen G. Giorgis	B	B	A	B+	B+	B		written				A+	A+	A	A	A	B+	A	A
5. Kebede Admasu												B	A	B+	B+	B	C		
6. Mammo Terefe	B	B	B+	B	A	B	B		D	B	A-	B	A	B	B	A-	B	A-	A
7. Amsaleu Temesgen												A	A						
8. Kahale Wondaferew	C											A	B	A	C				
9. Abera G. Egziabher	A+	A-	C	B	A	B	A					A	A	B	A				
10. Alemu Shehamet	C	C	B	B	C							A	A						
11. Sime Bekele	A-	B	B-	B	B	B						A+	A+	A	B	A	A	A	
12. Mohammed Yesuf	B	B	B-	B	B	B						B	A	A-	A				
13. Hailu Mihret	C	A-	A	A	A	A	A		B+		A	A	A	B+	B+	A	B	B	
14. Demissie W. Mariam	A	B+	A	B+	A+	B	B					A	A						
15. Hailu Abate	B+							assignment				A	A	A	A				
16. Gebre Medhim Geleta				A-	A	B+						A	A	B	B+	A	A		
17. Fikre Teklu	A-	B+	A-	A	A	B						A	A	A	A				
18. Abebe Worku	A	A	A	A-	A							A	A	A	A	A	A	A	A
19. Tadesse Wondimou												A+	A+						
20. Tegegn Kinde	A	A	B	A-	A+	A-						A+	A+	A	A	A+	A+	A+	A+
21. Tekeste Tsegai	A	A-	B	B	A+	A-	B		A		A	B	B	A	A	A		A	A
22. Nigussie Nigatu	B+	A	A	A	A	A	A					B+		A	A				
23. Tugi Wolekeba	B-	C+										B	B+	B	B				
24. Belihu Haile Meskel	C	B	C									B	B	B	A				
25. Getahun Eshete	B+	A-	B+									B+	B	A	A				
26. Tesfaye W. Kirkos	B	B	B	B	B	B						B+	B	A	A				
27. Ayalew Hailu	C	C-	C-	C-								A	A	A-	A	C	C		
28. Shiferaw Habtemariam												A	A	B	A				
29. Nigate Tamiru	A	B+										B+		A	A	A+	B		
30. Yayenishet W. Rufael	B	B+	B	B	A	B	B		B	C		A	A	A	A				
31. Ashagre Tadesse	B	C	C	D	C-	C-	D		D		C-	A	A	B-	B-	D	D	C	A-
32. Kassa Zewdu	B	C+	C+		C	B-	B		C		A	A							

Ethiopian Supervisors - Correspondence Grades for 1971

	BASIC CONCEPTS															MOTION GEOMETRY			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2	3	4
33. Berhane Mengesha												A	A	A	B				
34. Asmelash Belay	C+											B+	B	C	B	A	B		
35. Worku Tegabaru	B-	C	C	B	B	B						A	A	C	B				
36. Mohamed Saeed Abduleadir												A	A	B+	A				
37. Wondavehu Kassa	B	B	B	A	A	B+	B		D		A	B	B	A-	A	A	A	A	A
38. Demissie Megria																			
39. Bekru Bogale	B+	B+	C+	B+	A-														
40. Seyoum Yitave												A-							
41. Girma Negussie												A	A	B+					
42. Zerrhioun Makonnen																			
43. Hailu W. Michael																			
44. Yeshimareg Mesffin																			
45. Habtegebriel Ketema																			
46. Mesele Teka																			
47. Yohannes Dumas																			
48. Mbrattu Gebranguse																			
49. Mengistu Kebede																			
50. Aberra Abate																			
51. Solomon Gebre Giorgis																			
52. Alemu Belachew																			
53. Zegaye Arego																			

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

Ethiopian T. T. I. Teachers - Correspondence Grades for 1971

	BASIC CONCEPTS															MOTION GEOMETRY			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2	3	4
1. Tadege G. Medhin																			
2. A. V. M. Michael Durairaj																			
3. Gebre Berhan Aberra																			
4. K. Q. Krishnan Nambiar																			
5. Michael Zeru																			
6. Kidanemariam Hagos																			
7. K. K. Pahuja																			
8. K. Padmanabha Iyer																A+	A+	A	A
9. Rebecca A. Himantog																A+	A+	A	A
10. Rasiyah Duraisingam																A+	A+	A	A
11. Nallian Jeyasingh																A+	A+	A	A
12. M. J. Joseph																			

Ethiopian Model School Teachers - Correspondence Grades for 1971

1. Mengesha Geleta							B+			B-		B	B	B	A				
2. Fisseha Mengesha	A	B	A	B+	A	B+	A-					A	A	A	A	A+	A	A	A

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

KENYA TUTORS - CORRESPONDENCE GRADES FOR 1971

BASIC CONCEPTS

MOTION
GEOMETRY

		BASIC CONCEPTS															MOTION GEOMETRY					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2	3	4		
1. S.C. Agesa									No													
2. Miss S. Bakhda	40	A	A	A	A	A	A	A	written	A	A	A	A	A	B	B	A	A	A	A		
3. Sister Euphrosiana	36	A	A	A	A	A	A		assignment								A	A	A	A		
4. F.N. Githira	38	A	B+	B		A	A		-								B					
5. W. Juma	42	B+	B+						Study													
6. M.G. Kahuthu	44	B	B	B	A	A	A	A	only													
7. G. Kiambi	40	A		B		A				(now gone to Canada)												
8. E.M. Kobuthi		A	A	A	A	A+											B	A	A	A		
9. P. Lavin	44	A	A	A	A	A	A	A		A	A						A	A	A	A		
10. P. Kurta	44	A	A	A+	A	A	A	A		A	B	B	B	B			B	B+	B	A		
11. Rev. S. Lewis	46	A	A	A	A	A	A	A		A	A	A	A				A	A	A	A		
12. Bro. Leo McNulty	48																A+	A	A	A		
13. J. Ngari		A	A	B+	B+	B+																
14. D. Muhindi	26	B	A	B	B	A											A	A				
15. J.G. Mwai	38	A	(gone to a Secondary School								Post)							B				
16. D. Mwangi	44	A	A	B	B	B	A	A		B	B	B	A	A			A	A				
17. S.N. Nguthari	36	(left college for post in								Agricultural College)												
18. Z. Odumbe	30	A	A	A	A	A	B+	B		A	B	B					B	A	B	B+		
19. J.T. Okoth	42	A	A			A	A	B+														

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

KENYA PRIMARY SCHOOL INSPECTORS - CORRESPONDENCE GRADES FOR 1971

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1. S.O. Abeid	36	A	A	B					No written assignment - Study only								
2. A.A.C. Aguto	20	C	A	B													
3. W.K. Ambiso		B+	A+														
4. S. Chibudu	34	C	B	B	B	A	A	B			B	B	B	C			
5. J.M. Gitemi	30	B+	B+														
6. Esn. Kibutha	34	B	A+	A+	A+												
7. R.N. Kinvanjui	26	B	B	B				C									
8. E. Ludeki	30																
9. P.B. Machogu	26	C	B	B	B	B	B	B-			B	B					
10. S.N. Munene	34	B	A	A	A	A	A	B			B	B	A	A	B	B	B
11. S.A. Memon	42	B	B	B	B	C	A										
12. N. Munya-Njua	38	A	A	A	A	B	B	B+									
13. E. Mwangi	30																
14. L. Muthamia	26	A+	A+	A+													
15. J.J. Ndinika	38	B+	A	B	B	C	B	B			A	A	B	B	B	B	C
16. J.K. Njoroge	44	A															
17. B.D. Odhiambi		Transferred to Ministry Inspectorate Headquarters															
18. A.A. Odundo	28																
19. E. Omukulu	24	B	B+	C	B+	A-	B	B		A	B	B					
20. D.O. Ongile	36	B+	A	A	A	A	A	A		B+	A	A	B	B	A	A	
21. C.R. Onyawgo																	
22. J.R. Oyugi	36	B	B	B	B	B											
23. P.A. Rono	38																
24. T.M. Sitima	26	B	A														

EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

Box 30278
Addis Ababa,
Ethiopia

October, 1971.

To: All participants of E.A.R.M.P. Institutes
From: Makonnen Eunatu, Administrator, E.A.R.M.P.

To help us to assess the effect of E.A.R.M.P. and to guide us in future planning, I should be most grateful if you could complete and return the following questionnaire as soon as possible. In particular we would value your opinions on the effect, and your suggestions under these headings:-

A. How your own professional knowledge of Modern Mathematics has been affected, or influenced by

1. The December 1970 Mathematics Institute _____
January 1971

2. Correspondence Assignments _____

3. Visits by, and contact with, the Mathematics Educator(s)

B. Effect on your professional duties as a Maths Lecturer or Primary Schools Inspector of:-

1. The Institute _____

2. Correspondence Course _____

3. Visits by, and contact with, the Mathematics Educator(s)

C. Effect on wider national basis on College Mathematics programmes and primary supervision and teaching programmes.

D. Brief details of In-Service Courses conducted for Primary I Standard I teachers.

Date	District	No. of Teachers	Maths Covered	Problems Encountered
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E. Future Plans

1. Your ideas for nature and content of

(a) 1971/72 Institute _____

(b) 1971/2 Correspondence Courses _____

(c) Any other ideas _____

2. Your own interest in continuing to participant and the value or otherwise you attach to this _____

3. Any other ideas _____

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

Responses to Questionnaire

	A			B			C	
	1	2	3	1	2	3		
Benefited	16	7	13	14	3	8	5	There was no response from 12 participants on this
Partially benefited	2	2	0	2	4	2	0	
No effect	0	2	5	2	10	7	1	
Time shortage	0	12	4	0	7	1	0	
Defective	0	1	0	1	1	0	0	

D

No. of Participants		In-Serviced		Problems Encountered
Active	Inactive	No. of Personnel	Subject Covered	
15	3	8129	Standard I,II,III & Basic Concepts	Absence or shortage of books, disinterested, unresourceful & large numbers of participants. Transport, lodging, finance, time shortage, translation of certain words in vernacular

E

(1)	a	b	c
More	13	4	Secondary, University & Other lecturers, Ministry officials, site in town, more preparation & more courses, more books & films, assessment of performance for promotion, more visits by Educator.
As is	0	11	
Less	0	2	
Indifferent	2	1	
Point missed	3	0	
(2)		(3)	Provincial seminars by Educators, no written assignment, more time with tutors by Educator, visits, Institutes in April or August, demonstrations, incentives, broadcasting to teachers, certificate, written advice by Educators to D.E.O., Provincial or District seminars by College Tutors.
Willing	17		
Doubtful	1		
Unwilling	0		

October 1971 - March 1972
PROGRAMME OF VISITS TO TEACHER TRAINING COLLEGES, GHANA

by

John T. Norris, Maths Educator
WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

<u>Name</u>	<u>Training College</u>	<u>To Be Visited</u>
Messrs. G. K. Ansanyɛ, B. K. Addo, E. D. Ampong	Abetifi Training College	October 25 - 31
Messrs. Jacob Oteng, G. D. Obuobi	Nkwatia Training College	
Mr. T. A. Ayeh	Obo Training College	
Messrs. D. N. Odoom, M. A. Twumasi, S. G. Boateng, C. N. Koranteng	Presbyterian Training College, Akropong	November 1 - 4
Four-Day Institute, Monrovia		6 - 14
Cape Coast		16 - 19
Messrs. C. W. K. Asare, B. K. Asante, O. K. Yaya, Djamboe, Miss Vic. Aggor	Jasikan Training College	22 - 26
Messrs. L. M. Lomotey, G. L. Asare, C. K. Nyineku,	Mount Mary Training College	29 - December 3
Mr. C. N. Kissiedu	Krobo Women's Training College	
Cape Coast		6 - 8
<u>Third Institute, Abetifi, Ghana</u>		9 - 22
Cape Coast (Grading Papers)		27 - January 7
<u>Fourth Institute, Liberia</u>		10 - 22
Cape Coast (Grading Papers)		24 - 31
Re-writing Teacher Training Texts		February 1 - 12
Messrs. E. B. K. Atitsogbi, P. K. Akabua	St. Francis College, Hohoe	14 - 19
Messrs. Geraldo de-Lima, J. K. Ennin, H. A. K. Jamboe	St. Theresa's Training College, Hohoe	

Messrs. E. K. Asante, O. K. Yaya, C. W. K. Asare, P. C. Djamboe, T. G. B. K. Agyenku, Miss Vic. Aggor	Jasikan Training College	February 21 - 26
Mr. J. N. Takpo	Bueman Secondary School	
Messrs. G. K. Nyineku, G. M. Lomotey, E. L. Asare	Mount Mary Training College	28 - March 4
Mr. W. M. Kissiedu	Krobo Women's college	

February - June, 1972
PROGRAMME OF VISITS TO TEACHER TRAINING COLLEGES, GHANA

by

John T. Norris, Maths Educator
WEST AFRICAN REGIONAL MATHEMATICS PROGRAMME

<u>Name</u>	<u>Training College</u>	<u>To Be Visited</u>
Messrs. E.K. Asante, O.K. Yaya, C.W.K. Asare, P.C. Djamboe, T.G.B.K. Agyenku, Miss Victoria Aggor	Jasikan Training College	February 14 -18 With Ministry of Education Workshop
Mr. J.N. Takpo	Bueman Secondary School, Jasikan	
Messrs. E.B.K. Atit- sogbi, P.K. Akabua	St. Francis Training College, Hohoe	February 21 -25
Messrs. Geraldo de-Lima, J.K. Ennin, H.A.K. Jamboe	St. Theresa's Training College, Hohe	
Messrs. Jacob Otteng, G.D. Obuobi	Nkwatia Training College	February 28 - March 3 With Ministry of Education Workshop
Messrs. G.K. Nyineku, G.M. Lomotey, E.L. Asare	Mt. Mary Training College	March 6 - 10
Mr. W.M. Kissiedu	Krobo Women's Training College	
Messrs. J.O. Ameyaw, A. Shardow, F.K. Ayensu	Aburi Meth. Training College	March 13 -18
Messrs. C.N. Kissiedu, F.V. Gyan-Mante, Misses Aninagyei-Bonsu, V.A. Laryea	Preshv Women's Training College, Aburi	
Messrs. E.K. Gamedoagboa, A. Alobuia, A. Akude, Bonuedi	Akatsi Training College	March 20 -24 With Ministry of Education Workshop
Cape Coast - Training Colleges on Holidays		March 27 - April 14
Messrs. D.T. Mensah, E.N.Y. Annan, S.K. Fianu	Accra Training College	April 17 - 19

Mr. Wemekor	Anloga Training College	April 20, 21 With Ministry of Education Workshop
Messrs. B.N. Dzakpata, E.K. Kata	Ada Training College	April 24, 25 With Ministry of Education Workshop
Mr. M.C. Gaisie	Begoro Women's Training College	April 26 - 28 With Ministry of Education Workshop
Messrs. E.D. Dor, M.E.K. Mensah	SDA Training College	May 1 - 5
Mr. S.K. Djang	Tafo Training College	
Messrs. W.K. Agbo, A.Y. Doe	Peki Training College	May 8 - 12
Mr. M.M. Osei	Anum Training College	
Cape Coast Workshop		May 15 - 19
Messrs. Paul Dame, Boa- teng Ahenky	Juabeng Training College	May 22 - 26 With Ministry of Education Workshop
<u>Visit Colleges in North</u>		May 29 - June 16

September 1971 - March 1972
 PROGRAMME OF VISITS TO COLLEGES & SCHOOLS
 Sierra Leone, Liberia, Ghana

by

John W. Alexander, Jr. Maths Educator
 WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

<u>Name</u>	<u>School</u>	<u>To Be Visited</u>
Mr. E. S. Tucker	St. Theresa's Primary School, Freetown	September 28 - October 8
Miss A. H. Tumaku	St. Mary's School, Freetown	
Miss M. Cummings	St. Anthony's School, Freetown	
Miss Olivia E. Taylor	Tower Hill Municipal School, Freetown	
Mr. M. J. Ndanema	Catholic Mission, Moyamba	October 11 - 12
Mr. Samuel J. Gbondo	R.C. School, Mosongo, Njala	13 - 14
Mr. J. P. Manu	St. Edward's School, Freetown	15 - 20
Mrs. E. A. Macauley	Kissy Rural Junior School, Freetown	
Mr. A. B. Kamara	S.L.M.B. School, Freetown	
Mr. Thomas S. Dugba	St. Augustine's Training College, Makeni	21 - 22
Mr. M. Kamara	Our Lady of Fatima Schools, Makeni	
Mr. Thomas B. Aruna	R.C. School, Koidu Town, Kono	25 - 28
Mr. Moses B. Massaquoi	Catholic School, Moyema Via Yeng	
Mr. M. A. J. Bockarie, Mr. K. P. Varkey	Bo Teachers College, Bo	November 1 - 2
Mr. G. S. Komeh-Navo	St. Paul's School, Kenema	3 - 4
Mr. W. M. Johnson	Sumo Kota Elementary & Junior High, Loffa County	8 - 9
Mr. T. B. Snoh	Kakata Rural Teacher Training Institute	10 - 11
Mr. J. B. Dennis	Curriculum & Materials Centre, Monrovia	11 - 16
Mr. C. V. Kimber	M.C.S.S., Monrovia	

Mr. Joe Lewis Bettie	W.V.S.T. High School, Monrovia	
Mr. Alfred Paasewe	University of Liberia, Monrovia	
Mrs. Doris Thompson	Demonstration School, Monrovia	
Mr. Moses Elliot	Liberia Testing Centre, Monrovia	
Mr. J. Tamu Diggs	Episcopal High School, Roberts- port	17
<u>Visit to Cuttington - Bolahun</u>		18
Mr. J. A. Ngebeh	R.C. School, Lungi	22
Mr. E. S. Kanu	Catholic School, Lunsar	23 - 24
Freetown		25 - 29
<u>Arrive Accra</u>		30
Week-end Course - Cape Coast		December 3 - 4
Third Institute		9 - 22
Return Freetown		23
Fourth Institute		January 10 - 22
Freetown		23 - 29
<u>Arrive Accra</u>		30
Mr. Arthur	Komenda	February 1 - 2
<u>Arrive Takoradi</u>		2
Mr. Oguah	St. Mary's	3
Mr. Quansah, Sister MacDonald		4 - 5
Messrs. Asare-Afful, Kofie, Amoh & Kumi	Foso	7 - 12
Mr. Micah, Mrs. Afful	Ajumako	15
Messrs. Abbiw & Sagoe	Winneba	16 - 18
Messrs. Adjei, Ampofoh & Martinson	Nsaba	21 - 24
Mr. Yartey	Nyakrom	25
<u>Return Freetown (Base)</u>		28 - March 5

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

Tentative November/December 1971 Schedule

for
Professor Roy Dubisch

- November 1-6 In Nairobi for consultation with Fitzgerald in regard to Institute plans, correspondence lessons, and other EARMP activities.
- 8-9 Office
- 10 Haile Selassie I
- 11-12 Visit to Addis (Shoa) Education Office, supervisors and schools.
- 13,15 Office
- 16 Visit to H. S. I. University (education and mathematics departments).
- 17 To Makale (morning plane) for visit to Tigre Education Office, supervisors and schools.
- 18 Return to Addis (afternoon plane).
- 19-20 Office
- 22 To Debre Markos (morning plane) for visit to Gojam Education Office, supervisors and schools.
- 23 Return to Addis (afternoon plane).
- 24-25 Office
- 26 Visit to Debre Berhan TTI.
- 27 Office
- 29 Visit to H. S. I. TTI.
- 30 To Jimma (morning plane) for visit to Kaffa Education Office, supervisors and schools and TTI.
- November 30-
December 1 Jimma
- 2 Return to Addis (afternoon plane).
- 3-4 Office
- 5-18 In Nairobi for Kenya Institute.
- 20 Management Committee Meeting
- 21-24 Office
- 25-31 Holiday to Bahar Dar, Gondar, Lalibella, Axum, and Asmara.

- Notes: 1. Office work will include grading of correspondence lessons and planning for December and January Institutes.
2. I had originally planned to make the Makele and Debre Markos visits together but plane schedules do not permit this.

EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

1972 Schedule/Kenya

First Round of Visits by John C. Fitzgerald

<u>WEEK</u>	<u>COLLEGE OR OTHER CENTER</u>
January 24-29	Thogoto T.C. and Nairobi
January 31-February 5	Kisii T.C. and Asumbi T.C.
February 7-12	Chadwick T.C. and Kakamega (<u>West Prov. Inspectors</u>)
February 14-19	Highbridge T.C. and Nairobi
February 21-26	Meru T.C. and Egoji T.C.
February 28-March 4	Kignari T.C. and Embu (<u>East Prov. Inspectors</u>)
March 6-11	Kilemambogo T.C. and Nairobi
March 13-18	Kamwerja T.C. and St. Cecilians T.C.
March 20-25	Kagumo T.C. and Nyeai (<u>Central Prov. Inspectors</u>)
March 27-30	Shanzu T.C.
March 31-April 3	Easter
April 4-8	Mombasa (<u>Coast Prov. Inspectors</u>)
April 10-25	Probably on leave during college vacations
April 27-29	Kisumu (<u>Nyanza Province Inspectors</u>)
May 2-6	Sirib T.C. and Eregi T.C.
May 8-13	Kaimosi T.C. and Kericho T.C.
May 15-20	Loretto T.C. and Nairobi
May 22-27	Machakos T.C. and Kiteta T.C.
May 29-June 3	Kitui T.C. and Nairobi
June 5-10	Kitale T.C. and Mosoriot T.C.
June 12-17	Nakuru (<u>Rift Valley Inspectors</u>) and Nairobi

One Semester Course in
Evaluation

Being Prepared by

Dr. E. A. Yoloye
University of Ibadan

Details of Training Course

Course Work

1. Curriculum Theory and Practice - Background in the theoretical and philosophical foundations of curriculum development in general with analysis of a variety of specific curricula.
2. Approaches to Curriculum Evaluation - A consideration of alternative approaches e.g. the EPIC model and the CSE model, with study in depth of the APSP model.
3. Principles of Test Construction - including the construction of various psychological tests, questionnaires, rating scales, etc.
4. Economics of Education - General background with study in depth of cost-effectiveness analysis.

Practical Work

1. Practice in constructing and using evaluation instruments, e.g. Test Construction, Estimation of Readability Indices, Task Analysis, Interaction Analysis, Evaluation of ongoing curriculum programs.
2. Project. To be decided in relation to trainees' field of interest.