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PROGRESS REPORT
to the
AGENCY FOR INTERNATIONAL DEVELOPMENT
on the
REGIONAL MATHEMATICS PROGRAMS

February 1, 1971 to October 5, 1971

Contract AID/afr-711

Education Development Center, Inc.
55 Chapel Street
Newton, Massachusetts 02160
December 1, 1971

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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.

The purpose of this new program is threefold:

- a) To improve the mathematical background of the maths tutors and/or supervisors and the quality of maths education in the training colleges through institutes and correspondence courses;
- b) In cooperation with local personnel, to review, adapt and produce in Africa suitable common math textbooks based on the Entebbe Mathematics Series and other existing texts;
- c) To give local personnel experience in the preparation, adaptation and trial testing of teaching materials to help to build up a nucleus for ongoing curriculum development and research in mathematics.

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

Additional Staff

Two additional full-time expatriate staff members joined the Program July 1, 1971: Mathematics Editor/Educator, Professor Roy Dubisch and Mathematics Editor, Roger R. Hartman. These appointees will be responsible for the continuing preparation of materials adapted at the two workshops, classroom trials, the final production of camera-ready copy and the supervision of the training of the trainee editors.

Dr. Bernard J. Shapiro, Associate Professor of Education, Chairman of Foundations Department, Boston University, has been engaged as a consultant evaluator to the Program.*

EARMP/Addis Ababa

Professor Dubisch will function jointly as editor of the teacher training text adapted at the recent Nairobi workshop, Fundamental Concepts of Mathematics, Vol. I, as well as maths educator for Ethiopia. In addition, he will supervise the classroom trials of the adapted teacher training text in Ethiopia and Kenya and the training of the two EARMP trainee editors. Based at Mexico Square, Addis Ababa, Professor Dubisch is accompanied on his tour by Mrs. Dubisch and their son, Ralph. Professor Dubisch has been active in the AMP for several years both as a workshop participant and a lecturer at several teacher training institutes in Africa. He is currently on leave from the University of Seattle, Washington.

WARMP/Cape Coast

Roger R. Hartman, based at University College of Cape Coast, Ghana, will edit the several texts adapted at the 1971 WARMP workshop and supervise classroom trials of the adapted texts in Ghana, Liberia and Sierra Leone. Mr. Hartman, a former Peace Corps volunteer from 1967-1970, helped to implement a new mathematics program in Ethiopia. He was attached to the Ministry of Education in Addis Ababa where he assisted in the production of an Ethiopian adaptation of Entebbe texts and other teacher training materials and taught a number of in-service training courses. He has taught mathematics in the United States and Ethiopia. In February 1970, he prepared "Recommendations for an Integrated Mathematics Program in Ethiopian Secondary Schools" for the Ministry of Education in conjunction with the African Mathematics Program.

Overseas Staff

WARMP

Administrator: D.A. Brown, University College of
Cape Coast, Ghana

Educators: John W. Alexander, Jr., Freetown,
Sierra Leone

John T. Norris, University College
of Cape Coast

Editor: Roger R. Hartman, University
College of Cape Coast

*Secretary: Stephen Haynes

EARMP

Administrator: Makonnen Eunatu, Mexico Square,
Addis Ababa, Ethiopia

Educator: John F. Fitzgerald, c/o Ministry of
Education, Inspectorate, Nairobi

*Local hire

Editor/Educator: Professor Roy Dubisch, Mexico
Square, Addis Ababa

*Secretary Mrs. Haile Egigayehu,
Addis Ababa

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.

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.

*Local hire

Relocation of Maths Educator, Sierra Leone

Accommodations at Njala University, where Mr. Alexander was originally based, proved woefully inadequate. All efforts by Messrs. Brown and Alexander to obtain improvements or more suitable accommodations from the University proved futile. Mr. Alexander moved to new quarters in Freetown, February 1, 1971.

The possibility of Mr. Alexander moving to Liberia was discussed at the Management Committee Meeting in Freetown. It was agreed that in the event Liberian participation was increased to a point which would warrant the services of a local maths educator there was a strong possibility that Mr. Alexander would take up residence in Liberia. This move will be considered at the forthcoming December Management Committee Meeting.

PROGRAM ACTIVITIES

General

Prior to assuming their posts abroad, Messrs. Dubisch and Hartman visited EDC to familiarize themselves with general educational activities in the United States and abroad and more specifically to discuss the plans and details of the Regional Mathematics Program and how best they might approach their new duties. Considerable attention was given to the adaptation procedures for the writing groups at the workshops, the general tasks involved in editing these texts, classroom trials of the new materials and the training of the trainee editors. By July 1, 1971 the editors had assumed their new posts. Contact between the East and West African personnel is being maintained through correspondence.

Africa Visit

The Director, Hugh P. Bradley, Associate Director, John Joanou and Prof. Martin of MIT, visited Africa during July to attend the Management Committee Meetings in Freetown and Nairobi, plenary sessions of both workshops and to meet with the writing group leaders. Mr. Joanou arrived in Freetown a week early to assist Mr. Brown with Workshop preparations.

Correspondence Courses

Maths educators Alexander, Norris and Fitzgerald had prepared correspondence courses based on those used at the ABC Leadership Training Institute, Nairobi, 1966-1968, with revisions. Participants began their assignments shortly after the end of the initial four institutes held during the period December 1970 - January 1971. (See Appendices I, II, III, IV, Institute Reports, March 17, 1971 Progress Report to AID.)

WARMP: Based on number of participants, the Ghanians showed 83% in their correspondence course involvement; Sierra Leone 70%; and Liberia 27%

EARMP: Kenya tutors showed 75%; Kenya supervisors 50%; Ethiopian supervisors 50%-60%; Ethiopian lecturers: See Item 2, Recommendations and Changes.

Although overall involvement in the correspondence courses was considered good, a number of steps have been taken to improve these results.*

Training College Visits

The maths educators continued their visits to colleges and participants of the 1970/71 institutes. These visits cover the period February through June, 1971.** During this travel the educators visited institute participants,

*See Appendix III, Table 5a and Appendix IV, page 4.

**See Appendices X and XI.

discussed correspondence course assignments and assisted tutors and supervisors in planning their teachers' courses, pre-service and in-service. Visits to training colleges will 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 and XI.

Recommendations and Changes

1. Liberia was encouraged to increase its number of participants in the Program. Dr. Doris Banks-Henries, Department of Education, Monrovia, assumed responsibility for organizing a four-day in-service course in Liberia during November 1971 for 25 supervisors. WARMP will provide the services of Messrs. Alexander and Norris. Following this course, it is anticipated the supervisors will attend the forthcoming Winter Institute as full participants.
2. The twelve Ethiopian lecturers were overqualified for the existing course. Professor Dubisch has consulted with the lecturers and is upgrading the assignments.
3. All correspondence courses are under constant review and revision.
4. Participant involvement should improve now that Prof. Dubisch has assumed his duties in Addis Ababa.

Appointment of Trainee Editors and Evaluators

Each participating country was invited to appoint a Trainee Editor and a Trainee Evaluator dependent on

Ministry manpower needs. The Ministries will be responsible for the salaries of these trainees, but other expenses arising from Program activities or training outside their own countries will be assumed by the Program.

The training, partly "on the job", has begun with the workshops. Only one trainee editor, Mr. W. Momolu of Liberia was present at the workshop in Freetown. Roger Hartman, resident maths editor, introduced Mr. Momolu to several editorial skills as they relate to the production of graphic devices to communicate mathematical skills.* Mr. J.L. Bettie, trainee evaluator, met with Mr. Hartman and the consultant evaluator, Dr. Shapiro, and has undertaken a number of evaluation tasks on his return to Monrovia following the workshop.**

Sierra Leone has decided that a single trainee editor cum evaluator would suit their requirements and declared its intention to appoint such a trainee. Mr. S. Thomas and Mr. M.A.J. Bockarie were recommended for this appointment on the basis of their participation at the Freetown workshop. However, to date, no appointment has been made by the Ministry in Freetown.

Through the cooperation of the Ministry of Education, Accra, and Mr. I.N.K. Atiase, Deputy Chief Education Officer, Curriculum Research and Development Unit, Accra, Mr. E.B. Dogbe, Senior Education Officer, CRDU and Mr. Seth A. Minta, Education Officer, Saltpond, have been appointed as trainee editor and evaluator respectively. Mr. Minta was a participant in the Primary Writing Group at the Freetown workshop.

Ethiopia appointed Ato Aberra Waqjira of the Maths Department, Ministry of Education and Fine Arts, Addis Ababa, as trainee editor and Ato Girma Mengistu of the Ministry, trainee evaluator. Ato Girma is responsible for

*See Appendix XIII.

**See Appendix VI.

the Amharic adaptations of the Entebbe primary texts. This latter appointment has not yet been confirmed.

Kenya has appointed Miss Sushila Bakhda, tutor of Shanzu Training College, Mombasa, trainee editor. Mr. Gideon M. Kimote, Head of Maths Curriculum at the Kenya Institute of Education, Nairobi, is the trainee evaluator. Mr. Kimote's responsibilities at KIE include the supervision of the Kenyan adaptations of Entebbe primary texts.

Status of Trainee Editors & 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: No appointment to date
Mr. S. Thomas
Mr. M.A.J. Bockarie

EARMF

Ethiopia

Editor: Ato Aberra Waqjira, Mathematics Department,
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

With the exception of Messrs. Dogbe and Mengistu, all other trainees were participants at the workshops.

Workshops

The first workshops of the Regional Maths Program were held in Nairobi and Freetown during the summer of 1971.** Heavy emphasis was laid on the objective: namely, the Writing Groups were instructed to adapt existing maths texts -- as opposed to preparing new texts -- bearing in mind the special requirements of the participating countries. In both East and West Africa individual adapted training college texts tied to local syllabuses have been prepared.

Three African mathematicians and two U.S. mathematicians who were involved in the production of the original Entebbe texts supervised the workshops. Two of the African mathematicians are also members of the WARMP Management Committee. The adaptations were undertaken by local personnel working under the guidance of the mathematicians.

The local administrators make every attempt to alternate locations of principal activities, such as the workshops or the institutes, in all participating countries. Final selection of the site is dependent on consideration of reasonable costs and availability of suitable facilities.

*Appointment not yet confirmed.

**See Appendices I and II.

WARMP/Freetown

A workshop organized by D.A. Brown, Program Administrator, was held July 19-August 28, 1971 at the Institute of Education, Fourah Bay College, Freetown, Sierra Leone. Objective: to adapt common texts for primary, secondary and teacher training levels for use in Ghana, Liberia and Sierra Leone.

Professor N.D.J. Smart, Head of the Department of Education, Fourah Bay College, delivered an address at the plenary session of the workshop. The text of his address will be found in Appendix I a.

Problems

- a) Location: Sierra Leone offered to host the workshop early in April 1971; Ghana showed no interest. Mr. Brown made an inspection tour of the Kakata Rural Training Institute, Liberia, to consider that as a possible site. However, Liberia was unable to meet the target date which had been purposely extended to enable her to accept. Consequently, Sierra Leone's offer of Fourah Bay College was accepted.
- b) Books and Materials: Owing to the delay in deciding the location, large quantities of books and materials required for the workshop originally shipped to Ghana had to be reshipped and air-freighted to Sierra Leone. This reshipping involved considerable additional expenditure and labor which could have been avoided if it had been possible to make a more timely decision on the location.
- c) Equipment and Services: It was not possible to rent an office typewriter in Freetown, nor was it possible to borrow one, suitable for the math typing of the adapted texts. Consequently it became necessary to purchase a used office machine and three new portable models for use by the participants during off-hours.

The volume of typing proved to be far greater than had been anticipated. Three additional full-time typists had to be engaged

in addition to a part-time typist. An additional two typists were required for the last week of the workshop.

- d) Reproduction Costs: Charges by commercial reproduction facilities in Freetown proved exorbitant. The Program will investigate the possibility of obtaining a stencil duplicating machine.
- e) Credit: Before the opening of the workshop, rather heavy cash outlays were made for materials purchased in Freetown since Program checks were not honored. This proved to be cumbersome since a number of different items were to be obtained locally. Mr. C.E.A. Noah, Secretary of the Institute of Education, was helpful in assisting the Program to establish credit with one of the larger stationers/office equipment merchants in Freetown.

EARMP/Nairobi

A workshop organized by Mr. Makonnen Eunatu, Program Administrator, was held July 26-September 4, 1971 at the University of Nairobi. Objective: to adapt a common teacher training text for Ethiopia and Kenya.

Mr. Herbert J. Kanina, Chief Inspector of Schools, Ministry of Education, Nairobi, delivered an address at the opening session of the workshop. The text of his address will be found in Appendix II a.

A second activity, review of Subsidiary Mathematics Papers, originally planned for the workshop, was rescheduled. It took place at the New Education Building, University of Nairobi, September 16, 1971. For further details, see page 15.

Problems

With the exception of some materials not available locally, problems at Nairobi were minimal. Board and lodgings proved most satisfactory at the United Kenya Club. Two classrooms and reproduction facilities were provided for the Writing Group at the new Education Building of Nairobi University, a short distance from the Club.

OUTLINE OF TWO WORKSHOPS

Date: July 19-August 28, 1971

Site: Institute of Education, Fourah Bay College,
Freetown, Sierra Leone

WARMP Administrator: D. A. Brown

Co-Chairmen: Dr. D.K. Abbiw-Jackson, University of Science
and Technology, Kumasi, Ghana
Dr. A. Williams, University of Sierra Leone,
Freetown, Sierra Leone

Staff: Dr. D.K. Abbiw-Jackson
Dr. Shirley Hill, University of Missouri at
Kansas City, Missouri
Dr. A. Williams
Dr. Grace A. Williams, School of Education,
University of Lagos, Lagos, Nigeria

WORKING GROUPS

PRIMARY

Dr. Shirley Hill

Messrs. S.A. Minta	Ghana
A.K. Nyame	Ghana
B.K. Addo	Ghana
D.S.M. Lahai	Sierra Leone
S.J. Gbondo	Sierra Leone
Mrs. O. Benjamin	Sierra Leone
W.W. Johnson	Liberia
C.V. Kimber	Liberia

TEACHER TRAINING

Dr. Grace A. Williams

Messrs. P. Badu-Prah	Ghana
Y.A. Bempong	Ghana
A.Y. Doe	Ghana
T. Blamoh Snoh	Liberia
J. B. Dennis	Liberia
Dr. Romanus Ohuche	Sierra Leone
M.A.J. Bockarie	Sierra Leone
Messrs. J.T. Norris, J. W. Alexander, Jr.	Maths Educators, EDC

SECONDARY

Dr. D.K. Abbiw-Jackson

Dr. A. Williams

Messrs. J.S. Jackson	Ghana
B.A. Eshun	Ghana
S. Thomas	Sierra Leone
S. Russell	Liberia
Mrs. E. Palmer	Sierra Leone

EDITOR/EVALUATOR

Roger R. Hartman,
Maths Editor

Messrs. W. Momolu	Liberia
J.L. Bettie	Liberia

Texts Adapted At the WARMP Workshop

A total of 8 volumes were adapted as follows:

Primary I, Pupil Book and Teachers' Guide	2 vols.
Primary II, Pupil Book and Teachers' Guide	2 vols.
Handbook for Primary Teachers (with minor revisions)	1 vol.
Teacher Training Text, Volume I	1 vol.
Secondary I, Student Text and Teachers' Guide	2 vols.

These texts are currently being edited by Roger R. Hartman, resident maths editor at University College, Cape Coast, Ghana.

2. Date: July 26 - September 4, 1971
- Site: Education Building, University of Nairobi, Nairobi, Kenya
- EARMP Administrator: Makonnen Eunatu
- Chairman: Professor John W. Green, University of California, Los Angeles

WORKING GROUP

TEACHER TRAINING

Professor John W. Green	Miss S. Bakhda	Kenya
	Messrs. G.M. Kimote	Kenya
	T. Gebremedhin	Ethiopia
	A. Waqjira	Ethiopia
	J.C. Fitzgerald	Maths Educator, EDC
	Prof. Roy Dubisch	Maths Editor/ Educator, EDC

Dr. Edward Jacobson, a UNESCO appointee, of the Department of Mathematics, University of Nairobi, kindly contributed his services.

Text Adapted at the EARMP Workshop

Fundamental Concepts of Mathematics, Volume I

Professor Dubisch, with the assistance of Miss Bakhda, trainee editor from Mombasa, Kenya, completed the editing of this text shortly following the end of the workshop.

Subsidiary Mathematics Review

A meeting to review and discuss five basic papers on Subsidiary Mathematics was held in Nairobi September 16, 1971 at the Kenya United Club under the supervision of J. E. Phythian, Professor and Head of Mathematics Department, University of Dar Es Salaam. The group was convened to consider what mathematics is needed at "A" level for the non-mathematician who finds it necessary to use mathematics in his field of specialty.

The following papers were reviewed:

1. Economics
2. Biology
3. Physics
4. Algorithms and Computers
5. Geography and Geology

A report of the Subsidiary Mathematics Conference will be found in Appendix VIII.

Management Committee Meetings

Management Committee Meetings were held at Fourah Bay College, Freetown, and the Kenya United Club, Nairobi, during July 1971.* These meetings reviewed such Program activities as:

- a) status and membership of the Committees
- b) their relationship with the Ministries of Education
- c) their relationship to WACTE and EARCE
- d) activities of the maths educators with special reference to correspondence courses
- e) incentives for participants
- f) trainee editors and evaluators
- g) future plans for 1972.

At both meetings Hugh P. Bradley, Director of the African Mathematics Program, announced his resignation from EDC effective September 1. Both committees regretted Mr. Bradley's decision to leave. Through a unanimous vote of thanks the members paid warm tribute to his performance in the

*See Appendices III and IV

Program. In addition, WARMP members agreed that Mr. Bradley would retain his membership through December 1971. John Joanou, Associate Director, was elected to replace Mr. Bradley as an EDC member on both committees.

Mode of Operation of the
Management Committees of WARMP and EARMP

Questions regarding the mode of operation of the management committees were discussed at length at both meetings. At the Nairobi meeting, Ato Bekele Getahun, Ministry representative of Addis Ababa, specifically requested Messrs. Bradley, Joanou and Prof. Martin to define in writing the relationship between the administrators, educators and editors. In response to this request, a paper entitled Mode of Operation of the Management Committees of WARMP and EARMP* was prepared. This paper seeks to define clearly the composition of the committees, the role of EDC, the committees and the local administrator and the relationship between the administrator, educators and editors. In particular, it deals with the present interim period and sets forth the prerequisites for the eventual transfer of the Program to an African organization. It was reviewed and approved by Ato Bekele Getahun.

In view of the fact that the Regional Maths Programs will be transferred to wholly African management it was felt that such a document would be helpful and indeed, necessary to both programs. Therefore, copies of Mode of Operation, together with the final Report of the Management Committee Meeting, have been despatched to all committee members, administrators, educators and editors.

Institutes

The first four institutes were reported in the March 17, 1971 Progress Report to AID. Institutes for December 1971/January 1972 will be held at Addis Ababa, Kenya, Ghana and Liberia.

*See Appendix V.

The meetings proved successful. In all five countries the Ministries gave verbal assurance that they would indeed print the adapted texts, upon approval of the camera-ready copy. However, it was not possible to identify a line item for this purpose, in their respective budgets, since camera-ready copy would not be available before October 1972. Given this, the line item to be identified would have to be in the 1972-73 budgets which had not been prepared at the time of the discussions.

In addition to the verbal assurances, a letter of assurance was obtained from the Ministry in Addis Ababa. A second letter of assurance from Mr. Issac Hunja has been received. Copies of these letters may be found in Appendix IX. Follow up letters have been sent to the Ministries in Accra, Monrovia and Freetown eliciting their replies.

This visit provided an opportunity to impress upon both administrators AID's requirement that they must be able to perform all the key functions in administering their programs in order to enable transfer to them and the Management Committees full control of the Regional Maths Program.

Legal Status: Possible Association with WACTE and EARCE

"Proposal for a Working Relationship with WACTE"* was circulated to members of the West African Council on Teacher Education for comment and suggestions by that Council's Executive Secretary. A meeting in Ghana scheduled for November 1971 is to decide on whether the Council is willing to take the WARMP Management Committee under its wing.

The possibility that the EARMP Committee might associate itself with the East African Regional Council of Education has been ruled out by the Ministries of Ethiopia and Kenya on the grounds that the Council is an association of universities. Both Ministries have made it clear that they wish to ally themselves with an association of governments. Mr. Eunatu,

*See Appendix X, March 17, 1971 Progress Report to AID.

Program Administrator, was instructed to inform the Council's Secretary of this decision.

Ato Bekele Getahun, EARMP Ministry representative from Addis Ababa, stated that a legal body such as the one sought by the Committee can be readily formed in Ethiopia and accepted responsibility for this effort. Mr. Issac Hunja of the Nairobi Inspectorate agreed with Ato Bekele and said that in the event this endeavour is not possible through Addis Ababa he could, with equal facility, accomplish this through Nairobi.

Evaluation Plans

Dr. Bernard J. Shapiro, Associate Professor of Education, Chairman of Foundations Department, Boston University, has been engaged to do an evaluation of the program. In addition to some key evaluation considerations, his plan includes the development and training of the trainee evaluators appointed by each of the five participating countries.

Dr. Shapiro visited the workshops at Freetown and Nairobi to better acquaint himself with the Program. His general approach was to sit with the various writing groups simply as an observer and then discuss both individually and in group meetings possible evaluation plans.

Separate Evaluation Plans for East and West Africa* include four problem areas:

1. a) Comparison of classes using original Entebbe Series versus control classes using traditional maths texts at Primary Seven level. (Kenya)
b) Testing of Entebbe Series Primary Three level. (Ghana, Liberia, Sierra Leone)
2. A test-trial of the revised materials being prepared at the workshops.
3. The institute program.
4. The development and training of the trainee evaluators.

*See Appendices VI and VII.

PLANS FOR 1972

Correspondence Courses & TTC Visits

Correspondence courses and training college visits will continue as scheduled. Now that Prof. Dubisch has assumed his post in Addis Ababa, Mr. John Fitzgerald, formerly maths educator for both Ethiopia and Kenya, will be able to concentrate primarily on Kenya.

Classroom Trials

Classroom trials of the adapted texts will be conducted during the 1971-72 academic year under the supervision of the educators, editors and Dr. Shapiro. The trials will be limited to two classrooms per level per country. These trials are not intended to evaluate the mathematics. The objective of the trials is to see that the language used in the texts is appropriate and that the layout, diagrams and notations are clear and attractive to the eye.

Workshops

Two summer workshops are scheduled during July/August of 1972, one in the East and one in West Africa: WARMP will undertake adaptations of Primary III, a second volume of a teacher training text and Secondary II; EARMP will complete the second teacher training volume. In addition, both workshops will review the results of the recently completed classroom trials.

Local Trainee Editors & Evaluators

Trainee editors will continue their training with the maths editors at the workshops and, through correspondence, in their respective countries during the academic year. Trainee evaluators will do likewise under the

supervision of the resident maths editors, and Dr. Shapiro. These evaluators will be collecting various data from the classrooms and arranging tests as part of their training.

This "on the job" training for evaluators will be followed by a one semester course on evaluation at Ibadan University in 1972; and a six week course on the preparation of exam questions at TEDRO * in early 1974. The trainee editors will visit the United States for a three month period to acquaint themselves with editorial practices and printing facilities. This trip scheduled for late 1973 will be organized by Franklin Book Programs.

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 XII.

Local Program Direction

The possibility of WARMP's association with WACTE will reportedly be decided at a meeting of that organization scheduled for November 1971. Progress towards establishing EARMP under the sponsorship of an organization of governments rather than universities should be forthcoming at the December Management Committee Meeting.

Final Copy

Camera-ready copy of all the adapted texts is due to be completed during October 1972 following a review of the classroom trials at the 1972

*Testing and Education Research Organization

workshops. Efforts are being made to assist editor Roger Hartman with his unusually heavy workload.

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.

Subsidiary Mathematics Conference

The Program will attempt to obtain funds to support the publication of a Subsidiary Mathematics text. EARMP supported the initial meeting in Nairobi, September 16, 1971. The proposed conference to be held during the 1972 EARMP workshop would involve a two day meeting of seven participants under the supervision of Prof. J.E. Phythian. The text will be used in Ethiopia, Kenya, Tanzania and Uganda.

STATUS OF THE PROGRAM

Impact

Additional expatriate staff, two maths editors, were appointed in time to take part in the Program's first summer workshops. Although a number of African participants nominated for the WARMP workshop were, for a variety of reasons, unable to attend, eight volumes of primary, teacher training and secondary texts were successfully completed during the brief six week period. In Nairobi a much smaller group completed its task of adapting the first volume of a teacher training text.

Classroom trials of the adapted texts are underway in all the five countries under the supervision of the maths editors. Trials will be

*Formerly, African Primary Science Program

confined to two classes per each level (primary, teacher training and secondary) in each country.

The trainee evaluators have begun their training by undertaking tasks set forth in the Evaluation Plans and will meet with Dr. Shapiro when he visits the December/January institutes to discuss further activities.

Trainee editors worked closely with the two maths editors at the workshops and will continue tasks assigned by the editors designed to familiarize themselves with the necessary pre-publication skills.

The correspondence courses and training college visits continue according to schedule. Participation, although good, will likely improve now that an additional editor/educator has been added in Ethiopia. John Fitzgerald whose former beat included both Ethiopia and Kenya is now able to concentrate efforts on Kenya.

Commitment

Ministry cooperation continues to be good. Some difficulties arising from lack of communication have been resolved. The Ethiopian and Kenyan Ministries have provided office accommodations for the program administrator and the maths educators. The Ministry at Accra has been helpful in providing housing and office accommodations for WARMP at the University College of Cape Coast.

The Ministries have cooperated in nominating the necessary number of workshop participants and for the most part have appointed trainee editors and evaluators. Too, they have provided travel expenses for local institute participants as previously agreed and have cooperated in providing suitable institute facilities.

In both East and West Africa the Ministries and local personnel assisted the program in securing good living accommodations and classrooms for the workshops. As in the past, African university mathematicians have been most willing to assist at the workshops and have indicated strong interest in participating at the workshops planned for 1972.

The Ministries have agreed in principle that some incentives must be provided to those participants who successfully complete the courses. However, they find it difficult to follow through since it would appear that they are favoring mathematics as opposed to other disciplines. The Program continues to urge the Ministries towards this end in the belief that the Regional Maths Program represents a very special undertaking calling on considerable resources and manpower and thereby would seem to merit exceptional consideration to the ultimate benefit of the participants and the countries.

The future of the adapted materials prepared at the workshops has been discussed at length at Management Committee Meetings and meetings with the Ministries. All texts will be protected by a Copyright held by WARMP or EARMP. The understanding is that the Program will trial test the materials in the classroom and finally produce camera-ready copy during October 1972. The materials will then be examined by national text book review committees. Once the texts have been accepted as suitable, the Ministries will place printing orders and assume all costs for the production of the texts. The Program has suggested suitable printing facilities in Africa; however, the Ministries will decide whether national considerations make it desirable to print locally or whether they may possibly take advantage of cheaper costs elsewhere.

The Ministries of all participating countries have given their verbal assurances that they will indeed print the adapted texts, upon approval of the camera-ready copy, following classroom trials. Ethiopia and Kenya have, in addition, provided letters of assurance.

Since the adaptations have been undertaken by local Ministry personnel, under the direction of African university mathematicians, the acceptance of the materials by the national book review committees seems most probable.

* * *

Education Development Center and the Program Management Committees are grateful to the USAID officials in Washington and in the field who have helped and advised in the development of the Program and for their sympathetic understanding of the Program's aims and the needs of African school mathematics.

Hugh P. Bradley

This report would not be complete without mention of Hugh P. Bradley, Director of the African Mathematics Program from March 1964 to September 1971.

Mr. Bradley's broad experience in African education, both as teacher and administrator, together with his singular contribution in originating new African curriculum reform programs at EDC -- especially in the field of teacher training -- has greatly benefited African education.

West African Regional Mathematics Program

Report

of the

First Maths Workshop

July 19 - August 28, 1971

Institute of Education
Fourah Bay College, Freetown, Sierra Leone

1. PREPARATIONS

The main preparations were:

- a) Nomination of Participants
- b) Getting Primary, Secondary and Teacher-Training Modern Maths Syllabuses from the three countries
- c) Selection of a suitable venue
- d) Obtaining requirements for the workshop

2. NOMINATION OF PARTICIPANTS

There were two categories of nominations, namely,

- i) those for the writing groups, Primary, Secondary and Teacher-Training. For these the Maths Educators were to make the initial nominations for the approval of the Ministries of Education.
- ii) nominations of Editors and Evaluators to be made by Ministries, the latter from among Workshop participants who were employees of Ministries.

3. The nomination for the various groups were made by the Maths Educators and forwarded to the Ministries in March. By June 30, 1971, the Ministries had approved nominations as follows:

Teacher Training	Primary	Secondary
<p>Mr. P. Badu-Prah (Tutor-Trg. Coll)</p> <p>Mr. Y.A. Bempong (Min. of Education)</p>	<p>Mr. Seth Minta (Educ. Officer)</p> <p>Mr. Andrew Nyame (Educ. Officer)</p> <p>Mr. B.K. Addo (Tutor-Trg. Coll)</p> <p>Mrs. Lucy Tagoe (Educ. Officer)</p>	<p>Mr. J.S. Jackson (University of Ghana)</p> <p>Mr. B.A. Eshun (Sec. School Teacher) Mfantshipim</p> <p>Mr. J.K. Okine (Headmaster) Approval still awaited</p>
<p>Mr. Romanus Ohuche (Njala University)</p> <p>Mr. M.A.J. Bockarie (Tutor-Trg. Coll)</p>	<p>Mr. D.S. Lahai (Snr. Inspector of Schools)</p> <p>Mr. J.S. Gbondo (Primary Sch. Tr.)</p> <p>Mr. T. Dugba (Method Master) Trg. College</p> <p>Mrs. O. Benjamin (Ag Headteacher) Primary</p>	<p>Mr. J.E. Jonah (Sec. Sch. Teacher)</p> <p>Mr. S. Thomas (Sec. Sch. Teacher)</p> <p>Mrs. E. Palmer (Sec. Sch. Teacher)</p>
<p>Mr. Blamoh Snoh (Tutor-Trg. Coll)</p> <p>Mr. Moses Elliott (Testing Centre)</p>	<p>Mr. Tamu Diggs (Rg. High School)</p> <p>Mr. James Maximore (Teacher)</p> <p>Mr. W. M. Johnson (Teacher)</p> <p>No fourth nomina- tion, lack of suitable candidate</p>	<p>Mr. Lewis Bettie (Tr. High School)</p> <p>Mr. Solomon Russel (Univ. of Liberia)</p> <p>Mr. Rapus Parley (Tr. High School)</p>

4. Also by June 30, Liberia had nominated a Counterpart Editor and a Counterpart Evaluator, but both Ghana and Sierra Leone had only intimated their intention to do likewise. As it turned out neither Ghana nor Sierra Leone had made these nominations by the time the Workshop started. Consequently the Management Committee at its meeting on July 22, decided that the Workshop should propose suitable persons to Ministries from among Workshop participants for appointment as Counterpart Editors and Evaluators where these appointments had not yet been made. Appendices 1 and 2 accordingly issued to the Ministries of Education, Ghana and Sierra Leone.

5. DROP-OUTS

There were eight drop-outs, two of them owing to illness. It was possible to find only three replacements due to short notice. The final attendance list was as follows:

WORKING GROUPS

PRIMARY GROUP

DR. SHIRLEY HILL: Messrs. S.A. Minta Ghana
A.K. Nyame Ghana
B.K. Addo Ghana
D.S.M. Lahai Sierra Leone
S.J. Gbondo Sierra Leone
Mrs. O. Benjamin Sierra Leone
W.M. Johnson Liberia
C.V. Kimber Liberia

TEACHER TRAINING GROUP

DR. G.A. WILLIAMS: Messrs. P. Badu-Prah Ghana
Y.A. Bempong Ghana
A.Y. Doe Ghana
T. Blamoh Snoh Liberia
J.B. Dennis Liberia
Dr. Romanus Ohuche Sierra Leone
M.A.J. Bockarie Sierra Leone
Messrs. J.T. Norris, J.W. Alexander Maths Educators, EDC

SECONDARY GROUP

PROF. A. WILLIAMS & DR. D.K. ABBIW-JACKSON:
Messrs. J.S. Jackson Ghana
B.A. Eshun Ghana
S. Thomas Sierra Leone

SECONDARY GROUP

PROF. A. WILLIAMS & DR. D.K. ABBIW-JACKSON:
Mr. Solomon Russel Liberia
Mrs. E. Palmer Sierra Leone

In addition to the above there was also the Editor/Evaluator Group comprising Messrs. W. Momolu and J. L. Bettie both of Liberia, under Roger Hartman.

6. MODERN MATHS SYLLABUSES

Syllabuses in the modern maths were available in Sierra Leone and Ghana for the Primary and Teacher Training levels and these were obtained from the two countries. Liberia reported that it had no syllabus in modern maths and sent instead syllabuses in the traditional maths for Grades 3 to 8. In both Ghana and Sierra Leone, some of the Secondary Schools used the West African Examinations Council Syllabus in the modern maths.

7. SELECTION OF A VENUE FOR THE WORKSHOP

Three offers were received from Sierra Leone about early April, 1971. About the same time Liberia reported that it could not host the Workshop. Ghana showed no interest. The Management Committee at its meeting in January had expressed the hope that Liberia would provide the necessary requirements to enable the Workshop to be held there. Accordingly a special appeal was made to the Secretary of Education, Hon. Flamma Sherman. The Administrator visited Monrovia and was shown round Kakata Rural Training Institute. In the event, however, Liberia was unable to meet the target date, although this was extended to give her a chance and Sierra Leone's offer of Fourah Bay College was accepted. Owing to the delay in deciding the venue for the Workshop large quantities of books and other items which were required for the Workshop were shipped to Ghana and had to be re-shipped or air-freighted to Sierra Leone when it was later decided to hold the Workshop there. This involved additional expenditure of both money and physical energy which could have been avoided if it had been possible to make a timely decision on where the Workshop was to be held.

8. WORKSHOP DATES

No objections were raised to the dates fixed for the Workshop, namely, July 19 - August 28, 1971.

9. TRAVEL ARRANGEMENTS

Participants from Ghana were given assistance by the Office of the Administrator by way of letters of introduction and personal contacts with the appropriate authorities to facilitate the issue of travel documents to them. At the request of the Administrator, Liberian participants received similar assistance from the Dept. of Education, Monrovia. Air Tickets were supplied to Ghanaian and Liberian participants and they were advised to travel to Freetown on Saturday, 17th July where they would be met by the Administrator and taken to Fourah Bay College. Those from Sierra Leone were advised to report on Sunday July 18.

		<u>Ghana</u>	<u>Liberia</u>	<u>S. L.</u>
July 17, 1971	No. Expected	7	9	-
	No. Arrived	5	6	-
July 18, 1971	No. Expected	-	-	9
	No. Arrived	-	-	7
	No. Arrived other times	<u>3</u>	<u>1</u>	<u>-</u>
<u>Final Totals</u>		8	7	7

10. In addition there were also the Maths Educators, Messrs. Norris and Alexander, Mr. Hartman the Editor and the Administrator, Dr. Shirley Hill and Dr. G. A. Williams and the two Co-Chairmen, Dr. Abbiw-Jackson and Prof. Williams. Those expected but did not turn up were seven in number namely:

Ghana: Mr. J. K. Okine (Sec. Group) and an Editor (not appointed by Ministry)

Liberia: Messrs. T. Diggs (bereavement) Maximore (Primary Group)

Sierra Leone: T. Dugba (Primary Group) and Mr. Jonah (Sec. Group) the latter due to illness; and an Editor (not appointed by Ministry)

11. Initially according to arrangements which were made by the Secretary of the Institute of Education, Sierra Leone, Mr. C. E. A. Noah, Workshop participants were to have stayed in Lati Hyde Hall, but they were later allocated Blocks G & M (Men's Hall) instead to allow repairs to be carried out at the former Hall. By the kind permission of the Head of the Dept. of Education that Dept's building was used as work center where all the Group meetings were held and the Office of the Administrator was housed. Fourah Bay College allocated a Bus full-time to the Workshop and also gave the participants access to the college library. All these arrangements were made for the Program by the Secretary of the Institute of Education, Mr. C.E.A. Noah.
12. A list of participants and E.D.C. staff showing dates of arrival and departure is attached as Appendix 3.
13. Mr. John Joanou and the Administrator arrived in Freetown on July 13, and set about tying together loose ends in the arrangements for the Workshop. Many of the packages of books sent from Ghana were still held by the Shipping Agencies and Sierra Leone Airlines. By July 19 they had all been collected and sorted out into Primary, Secondary and teacher Training categories for the three writing groups and most of the other requirements which were obtainable in Freetown

had been purchased. It was found out that only a few of the S.M.P. books required for the Secondary Group and no J.S.P. books at all had been provided. Also only the Book One of the Elementary Maths by Lucy Tagoe and Amar was available. The J.S.P. Books were obtainable locally by Prof. Williams and the Elementary Maths by Lucy Tagoe & Amar by Mr. Minta from Ghana. An order was placed for the S.M.P. books by cable. These arrived in the last week of the Workshop. One Imperial Typewriter was loaned to the Workshop by the Bursar's Office. A second-hand Olivetti and three new portable Typewriters were purchased at reasonable prices in Freetown since these could not be obtained on loan nor could they be rented. The portable machines were purchased for use of participants and they did in fact fulfill a real need. Prof. Williams succeeded in obtaining three Imperial Typewriters on loan from the Y.W.C.A. Typing School for the use of the Workshop and another Imperial Typewriter was also loaned to the Workshop by Fourah Bay College.

14. OPENING OF THE WORKSHOP

A copy of the Programme is appended. The opening ceremony was performed by Prof. N.D.J. Smart, Head of the Department of Education on behalf of the Vice-Chancellor who was out of the country. A copy of his address is annexed as Appendix 4. The Workshop felt greatly reassured of the value of the assignment it was about to carry out.

15. The Opening Ceremony was followed by a Plenary meeting at which two participants from each country spoke briefly about the position of mathematics teaching in their respective countries. As may be expected the picture was in general a sombre one. For the most part mathematics was still the hated subject in the curriculum. Everywhere there was shortage of textbooks and teachers of the subject and a woeful lack of the better quality of both. Associations of Teachers of Mathematics were doing good work in Sierra Leone and Ghana but there was no such association in Liberia. There had been a small degree of a break through in Ghana where Education Officers who had received training in the U.K. in modern approaches to mathematics teaching had been appointed Maths Organizers throughout the country and there had also been some clamour for the Modern Maths particularly at the Primary Level. But even in Ghana too as in Sierra Leone and Liberia the subject was still taught at the Secondary level largely by expatriates. It was clear that the WARMP was fulfilling a present need and that the assignment before the Workshop when completed would meet a crying demand.

16. PROGRAMME OF DAILY ACTIVITIES

A programme of daily activities issued on Sunday, July 18 to participants. A copy is appended as Appendix 5. By this Programme the day started at 7:00 a.m. and ended at 7:00 p.m. This had later to be modified because:

- (a) The Employees, particularly cooks and pantrymen etc., could not work the times suggested owing to the rains, the difficult road and the lack of adequate transportation service from the town to the college.
- (b) As a rule office workers did not report before 8:30 a.m. The Workshop finally decided to work the following hours:

Breakfast	..	..	7:30 a.m.
Groups	..	..	8:30 a.m.
Tea/Coffee Break	..	..	10:30 - 11:00
Lunch	..	..	1:00 p.m.
Groups	..	..	2:30 p.m.
Tea/Coffee	..	..	5:00 p.m.
Dinner	..	..	7:00 p.m.

NO SESSIONS ON SATURDAYS AND SUNDAYS.

17. WRITING GROUPS

Group meetings started in earnest on Tuesday, July 20. By the end of the second week the position was as follows:

(1) Primary Group

- (a) Completed a comparison of the existing Primary Books I & II with the syllabuses from Sierra Leone and Ghana (No syllabus received from Liberia).
- (b) Agreed on changes to be made in the Primary I and Primary II Books so that the adaptations would conform to the syllabuses.
- (c) Completed the adaptation of Primary I Books
- (d) Discussed with Dr. Shapiro plans for submitting evaluation questions on Primary III books.

(2) Secondary Group

- (a) Completed a study of the existing material - S.M.P., J.S.P. and Entebbe and had agreed on and prepared a list of what the first two years of the Secondary School course should contain.

- (b) Drew up details of chapter content and had prepared first drafts of some chapters

THIRD WEEK

(1) Primary Group

- (a) Completed adaptation of all Primary I Books and the revision of the Teachers' Handbook and handed them in.
- (b) Completed 3/4 of the work on the Primary II Books.

(2) Secondary Group

- (a) Completed and was editing the 1st Year Course based mostly on the Entebbe. Material from S.M.P. and J.S.P. had been re-written.
- (b) Started work on 2nd Year Course.

(3) Teacher Training Group

- (a) Decided that Basic Concepts did not completely meet the requirements of the Syllabuses and had therefore turned to Secondary and Primary texts for more relevant material.
- (b) Planned two books each containing two sections.
- (c) Started work on the first book which was the target for the present Workshop. Progress was held up by lack of sufficient number of typists.

FOURTH WEEK

(1) Primary Group

- (a) Adaptation of Primary II Books completed and handed in.

(2) Secondary Group

- (a) All chapters of the Book I had been edited and about half of them had been discussed.
- (b) Work on 2nd Year Book continued.

(3) Teacher Training Group

- (a) First drafts of all the chapters of Book I were ready.

FIFTH AND SIXTH WEEKS

On the recommendation of Dr. S. Hill, Mr. S.A. Minta (Ghana) was appointed to take charge of the Primary Group in the absence

of Dr. Hill during the 5th and 6th weeks.

Primary Group

Studied Primary Books III & IV with a view to determining the merits of the various chapters and units and suggesting which of them might be deleted or re-written or wholly retained. Also prepared comments and questions on these books to aid the evaluation study of the books.

Secondary Group

Completed their assignment in draft - both Pupils' Book and Teachers' Guide. Editing of both would be completed by the end of the Workshop.

Teacher Training Group

Had completed their assignment in draft. Of a total of eleven chapters, three had been checked and were semi-ready. The rest were nearing completion. The main problem was one of size. Some 300 pages were to be typed and edited.

18. EDITOR/EVALUATOR GROUP

It was a pity that only one Trainee Editor was present at the Workshop, the others not having yet been appointed by Ghana and Sierra Leone. Mr. Hartman had several meetings with the Administrator and outlined to him the programme of work he had planned for the Counterpart Editors, the equipment and materials he would require and the procedure he planned to adopt to prepare from the materials produced at the Workshop the texts required for classroom testing.

Copies of memoranda produced by Mr. Hartman are appended (Appendix 6). They deal with the following subjects:

- a. Editorial skills development
- b. Preparation of Materials for Class Testing
- c. Primary I (Pupils' Book) Materials for Classroom Testing.
- d. Trainee Editor/Evaluator in Sierra Leone (Appendix I)
- e. Trainee Editor/Evaluator in Ghana. (Appendix 2)
- f. Trainee Editor/Evaluator in Liberia (Appendix 2)

19. TYPING

The volume of typing turned out early during the Workshop to be far greater than had been anticipated. Initially two typists were engaged, one of whom was also a Stenographer Secretary. By the middle of the second week the two typists could not keep pace with the flow of drafts from the writing groups. It became clear that what was needed were more good typists rather than a Stenographer Secretary who charged heavily for skills which were either under-utilised or not used at all. Accordingly, steps were taken to engage

more typists. Meanwhile Mr. Roger Hartman, Editor and Mr. Momolu, Counterpart Editor, Liberia, lent a hand by typing most of the drafts of the Teacher Training Group while Prof. Williams arranged for those of the Secondary Group to be typed in the Maths Dept. of Fourah Bay College. By the end of the third week, three additional full-time typists had been engaged in addition to one part-time typist in the Maths Dept. of the College, and the Stenographer Secretary was paid off.

20. One of the three new typists left at the end of the fourth week and did not return. It became necessary to hire two more typists during the last week of the workshop to cope with the typing for the Teacher-Training Group.

21. SPEEDISETS

Only about 300 of these were available at the beginning of the Workshop and these were soon used up. A cable was sent to E.D.C. for more of these sets and they were received in the last week of the Workshop. About 1,500 Speedisets may have to be imported for the next Workshop since they are not available locally.

22. THE VISIT BY DR. BERNARD SHAPIRO

Dr. & Mrs. Shapiro arrived at the Workshop on July 29. Dr. Shapiro had sessions with all the writing groups and the Trainee Evaluator, Mr. Bettie, and he also visited Primary & Secondary Schools and Teacher-Training Colleges in and around Freetown. He paid a courtesy call on the Chief Education Officer and held discussions with the Head of the various places visited and a few of their staffs. He was accompanied on these visits by the Editor, Trainee Evaluator and Editor, the Administrator and the Secretary of the Institute of Education who made the arrangements for the visits. The meetings at the Ministry of Education, Milton Margai Teachers' College, Freetown Teachers' College and Prince of Wales Secondary School, Freetown, and the Freetown City Council were the most fruitful.

Dr. Shapiro's visit lasted seven days. A copy of his programme is appended (Appendix 7).

23. HEALTH

There were six cases of illness - three Ghanaians namely, Messrs. Nyame, Eshun and Doe, two Sierra Leoneans namely, Messrs. Lahai and Bockarie and one Liberian Mr. Kimber. All six were confined to bed for periods varying from one day to about one week in the case of Dr. Eshun. All the six were treated at the College Hospital. The College Doctor had to be taken to Mr. Eshun's room on one occasion to give him emergency treatment.

24. ENTERTAINMENT AND GAMES

The weather was wet and windy and not conducive to outings, particularly in the evenings. An excursion was arranged to Guma Valley Water Works where Freetown got its water supply from. Only about half the number of participants went on the visit owing to the inclement weather. Indoor games were provided and they were well used.

The Vice-Chancellor gave a Cocktail Party on Friday, 20th August in honor of the Workshop. Invitees included members of a visiting Canadian educational team, staffs of the University and the Ministry of Education, Freetown. Participants were also invited to a Party and dance given by the Minister of Education, Mr. Barthes Wilson, at Parliament House on Monday, August 23, 1971.

25. VISITORS TO THE WORKSHOP

The Workshop welcomed a number of distinguished visitors including the Chief Education Officer, Mr. Edmund Cole, Dr. T. J. Forde, Director designate of the Institute of Education, University of Sierra Leone, Dr. A. T. Thomas, Management Committee member representing the Permanent Secretary and Officer in charge of Teacher-Training in the Ministry of Education, and a number of former participants in Entebbe Workshop namely Mr. Taylor-Pearce, Deputy Chief Education Officer, Sierra Leone and Messrs. Jonah of the Prince of Wales Secondary School and Dyck Harding of Freetown Teachers' College.

26. In all there were only three meetings of the whole group during the entire period of the Workshop, the first was held right at the start to discuss recreational and other arrangements at the Hall of Residence, the second to deal with complaints about meals and the third to discuss end of Course Photograph and Dinner. Announcements were normally made by written notices to the Writing Groups or during the Tea/Coffee breaks.

The difficulties encountered at the Workshop arose largely from inadequate arrangements for typing and the lack of various items of production equipment and materials which were not obtainable locally. With the experience gained from this year's Workshop it should be possible to provide the necessary requirements more adequately and run a more successful workshop next year.

D. A. Brown
Programme Administrator

ADDRESS BY PROFESSOR N.D.J. SMART*

Head of the Department of Education
Fourah Bay College, Freetown, Sierra Leone

at the
Official Opening
of the

WEST AFRICAN REGIONAL MATHEMATICS PROGRAMME

FOURAH BAY COLLEGE

It is an honour and a privilege for me to have been asked to address this distinguished gathering of educationists and mathematicians this morning and to declare open this workshop of the West African Regional Mathematics Programme.

I should like to express the profound regret of the Vice-Chancellor, Professor Sawyerr and also of the Acting Vice-Chancellor, Professor Koso Thomas, for their not being able to perform this duty as they are both unavoidably out of the country on very important business.

In many ways it is a pity that neither of them is here today. Both of them by their professional training and interests are extremely fitted for this task. Canon Sawyerr is a theologian but he is also a distinguished educationist whose long academic career embraced a successful period of teaching mathematics and logic to undergraduates and a stretch of training college principalship. He thus has an excellent understanding of your programme and problems.

Professor Thomas is an engineer and therefore necessarily interested in all aspects of mathematics education, a discipline which is the foundation and buttress of his own applied science.

They have asked me to welcome you to this city, university and college; and they very much hope that you will be able to make full use of the modest facilities we offer and that you will also find some respite from your academic labours to enjoy the scenic beauty of Freetown and its environs and the great hospitality of our people.

The West African Mathematics Programme is an excellent example of successful co-operation at three levels: between a developed country and the underdeveloped; on a regional basis, between our good neighbours Ghana and Liberia and ourselves; and on the level of international scholarship.

Of all kinds of aid given by developed and rich nations like the United States of America, which is financing most of the projects in this

* Professor Smart's Address was printed in full in the Freetown Daily Mail.

programme, none is more beneficial than grants and resources for education. Roads and dams and hospitals are essential assets to a developing nation. But these could function maximally only if they are used and serviced by men and women whose minds are educated and sharpened. Artefacts depreciate and waste away; the education given to teachers have a multiplier effect and if properly planned can start a beneficial chain-reaction that will be useful not only in space but also in time. For the critical stage of our economic growth, the take-off stage, it is educated, trained and highly motivated labour that is the most important factor.

We all pay lip-service to the idea of regional co-operation in this our shrinking world. But in the spheres of politics and economics, the prejudice and lust for power of most public men make it very difficult for neighbouring states effectively to harness their resources and combine their strengths. It is ironic that in a colonial hegemony there is usually more co-operation among the subject peoples than when these same peoples are free nations. Europe was united under the sword of the Caesars and the harsh rule of the Holy Roman Emperors. Then followed a period of squabbling, independent fissiparous nation states. Today, after two bloody wars and the loss of nearly all their overseas possessions, the nations of Europe are making desperate efforts to achieve unity. The story is almost the same in West Africa. Under British rule, the English-speaking West African countries had more in common than they have now. It is therefore most pleasing to see the leaders of thought in this country and our sister countries in West Africa successfully co-operating in projects such as this.

The West African academic community has an obligation (to the peoples whose taxes and sweat make our exciting work possible) to lead in the march towards regional unity. Much has been given to us; much, therefore, is expected of us. The problems that we try to solve in our classrooms, libraries and laboratories are common problems. In this region and in this day and age, no scholar is an island sufficient to himself. We do not have the resources to emulate the prodigal programmes of the large centres of learning of the developed nations. We must, therefore, share our knowledge and intellectual tools. Your project is a splendid example of this sharing.

I needn't stress the importance of what you have come here to do. The need for mathematics in our age is now self-evident. For educationists like myself who were brought up in the academic traditions of the West, the age of innocence ended with the launching of Sputnik. This had a shattering effect on our traditional frames of reference. It accelerated the shift towards the natural sciences and mathematics in our schools and colleges. It upgraded Mathematics in the curriculum hierarchy to a position at par with literacy and the humanities, which had been the prestige offerings in the nineteenth and early twentieth centuries. In his classic report on secondary education in England, Crowther (1959) coined the needed and now famous word "numeracy", about which he has this to say:

.....there is need to the modern world to think quantitatively, to realise how far our problems are problems of degree even when they appear as problems of kind. Statistical ignorance and statistical fallacies are quite as

widespread and quite as dangerous as the logical fallacies which come under the heading of illiteracy. The man who is innumerate is cut off from understanding some of the relatively new ways in which the human mind is now busily at work.¹

Following the pioneering work of such giants as Riemann, George Boole, Galois and Cantor, modern mathematics has developed rapidly and invaded our lives completely. Apart from making possible such spectaculars as space satellites and probes, advances in mathematics have helped us significantly here on this earth. Work on symbolic logic has widened and deepened our knowledge of linguistics; the truth value calculus has accelerated the development of computer technology; researches in probability theory are making it possible for the social scientist to quantify, with some precision (and therefore to control) the many variables in the study of man and society. The economist, the industrialist, and the planner are all using mathematical models from network analysis, communications theory and games theory etc. for important decision making. For the modern state, mathematics is vital.

Developing nations like ours also need the tools of the mathematician. There is in this country a great scarcity of middle manpower. We have an urgent need for a large supply of technicians and technologists to build, service and repair the machines and structures that are increasingly needed on our roads, in our homes and offices, our factories and farms. We cannot train these people effectively without giving them some mathematical tools. Unfortunately in Sierra Leone the story of mathematics teaching is a very sad one. Whilst there is abundant growth in such marginal subjects (in terms of national survival) as Government, there is little enthusiasm for mathematics in our schools and thus only a small and murky pool of numerates is sucked into our training colleges and universities every year. It is on projects like this that we pin our hopes for a quantitative and qualitative increase in our supply of mathematics teachers.

For it seems that the old approach to mathematics is not challenging enough for the restless, adventurous and independent children of today. For most of them, the traditional courses in mathematics are a dreary grind of rules and their application, without any genuine understanding of the underlying processes. We have still not traveled very far from the complicated, frustrating and thoroughly useless problems of baths and taps running at full force, with the waste pipe wide open, with which teachers used to torture us in my school days.

As eminent mathematician Henri Poincaré says, children

.....want to know not only whether all the syllogisms of a demonstration are correct, but also why they are linked in one order rather than in another. As long as they appear to them engendered by caprice and not by an intelligence constantly conscious of the end to be attained, they

do not think they have understood. No doubt they are not themselves fully aware of what they require and could not formulate their desire, but if they do not obtain satisfaction they feel vaguely that something is wanting. Then what happens? At first they still perceive the evidences that are placed before their eyes, but as they are connected by too attenuated a thread, they pass without leaving a trace in their brains, and are immediately forgotten: illuminated for a moment they relapse at once into eternal night.²

Modern mathematics is not like this. It insists on structure. It emphasises discovery methods. The pupil is treated as an intelligent human being, and given an active awareness of the unifying themes of the subject, its language if you like, right from the start. And step by step with his teacher he travels on an exciting discovery road. The teacher helps him to read the map and teaches him how to interpret the signs of treasure, but the pupil is allowed to enjoy by himself the final joy of discovery. Taught in this way, Mathematics becomes a humane discipline, an essential requisite for the liberal education of our children.

And I am happy that our ideas of educability has changed so that we now teach successfully to secondary school children 'mysteries' in mathematics we once reserved for college students. We now believe with Jerome Bruner:

.....that any subject can be taught effectively in some intellectually honest form to any child at any stage of development.³

On this optimistic note I'd like to end. We in Fourah Bay are glad to have you with us. I sincerely hope that in spite of your crowded programme you will enjoy your stay. I wish your workshop every success.

Mr. Chairman etc, it is with great pleasure that I declare open this Workshop of the West African Regional Mathematics Programme.

¹ 15 to 18: a Report of the Central Advisory Council for Education (England) Vol. 1. HMSO. 1959.

² Henri Poincaré: "Mathematical Definitions and Education", Science and Method, pp. 117-42 trans. Francis Maitland, Dover Publications, 1952.

³ J.S. Bruner: The Process of Education, Harvard University Press, 1960

Report

of the

Primary Writing Group

WARMP Summer Workshop
July 19 - August 12, 1971

Institute of Education
Fourah Bay College, Freetown, Sierra Leone

I. The Goals of the Primary Writing Group can be described under two main headings:

- a) To adapt the Entebbe primary mathematics books for Classes I and II to the specific context of the three countries of West Africa involved in the regional project.

At one level, changes in problems, pictures and names to conform to the West African milieu, and at a deeper level, changes in language and experiences to reflect the cultural background of West Africa. At a somewhat more superficial level, some editorial changes were made to permit a smoother flow in the expository material.

- b) To update the material from a pedagogical standpoint.

The group added some activities and information for the teachers reflecting the many new pedagogical techniques that have become prominent since the Entebbe books I and II were written in the early part of the decade of the 60's.

II. The procedure for change utilized two different groupings of the entire primary group.

The first step was the comparison to existing official syllabi made by participants working together with their own countrymen. Suggestions for revisions or additions were made by each national group to the entire group on this basis.

In the second stage, participants separated into three working groups mixing the nationalities. In no group was there more than one person from a particular country. Different topics in the Entebbe books were assigned to each group. The group wrote suggested changes, additions and deletions and these suggestions were agreed upon by the entire group (which sometimes involved compromise), were the changes made. Final editorial work was then done by the Chairman.

- III. The mathematics development from Entebbe was kept intact. There was some rearrangement of a few topics but no substantive changes in the mathematics were made. Primarily, the changes and additions were of a pedagogical nature, particularly in providing a closer fit to the specific context of West Africa as well as the addition of some newer classroom activities.
- IV. There was a fairly large number of individual changes made in the teachers' books, but they were usually not extensive. The most extensive changes were the addition of entire new activities as well as the deletion of many activities. There were few changes in the pupils' book. Primary I and II are primarily pictures, and it was felt that except in a few cases, the pictures were appropriate. We did request making some of the pictures more recognizable and, in general improving upon the rather amateurish art work in some places.
- V. As Chairman, I was favorably impressed by the writing done by most group members. In most cases, it fit the existing style well, was often imaginative and inventive, and nearly always indicated an understanding of both the mathematics and of teaching. There were very few differences of opinion reflecting national bias. It seemed to me that it is quite feasible to have books that are appropriate for all three countries involved, with the exception of problems based on money and currency.

Dr. Shirley Hill

Report

of the

Teacher Training Group

WARMP Summer Workshop
July 19 - August 12, 1971

Institute of Education
Fourah Bay College, Freetown, Sierra Leone

Aims and Objectives

The main purpose of this workshop was to plan, prepare and adapt suitable materials from the Entebbe Mathematics Series for a trial edition of mathematics textbooks specially designed for Teacher Training Colleges in Ghana, Liberia and Sierra Leone. At this workshop, we prepared the first of two volumes for use in the Teachers' Colleges.

Background

Before the actual writing could begin we had to acquaint ourselves with numerous conditions which could affect the acceptance of these texts as well as their use in the Teachers' Colleges. An examination of the available teaching time for teaching mathematics in the Training Colleges of three countries revealed rather wide variations. In Ghana, Teacher Training Colleges are normally four-year courses with about 36 weeks of school year providing an average of 6 fifty-minute lessons per week. This gives a total of about 720 hours of mathematics education. In Liberia there is roughly a 3-year course of 33 weeks per year with 5 forty-five minute lessons per week giving a total of roughly 394 hours. This is about

the same for Sierra Leone. It is obvious that Ghana has many more teaching hours for mathematics than either of the other two countries, and allowance should be made for this difference.

Discission also revealed variations in the student body. In the three countries, it would appear that the majority of the students have only a primary school education; in Ghana there are a few colleges having students who have attended secondary institutions. However, information seemed to be that these students may not have studied mathematics. On the question of tutors it was also stated that most of the tutors were not mathematics graduates. It may be noted in passing that the programme of inservice training arranged for the various Teacher Training Colleges by WARMP in these three countries will assist to prepare tutors to use the text.

Another important consideration was the various syllabi of the three countries involved. In this respect, we also had to try to create a new syllabus that would be comprehensive and useful to the countries. It is our hope that the scope of work included here would adequately prepare teachers to teach modern mathematics and further be useful to the West African Examinations Council in building new teacher training syllabi for the whole of West Africa.

Studying the various primary, secondary and teacher training texts of the Entebbe series it was decided to do the following

- 1) Work out a detailed syllabus marking clearly materials which should be made compulsory and others which may be termed 'optional'. In this way the texts meet the needs of the three countries.
- 2) Ensure that every aspect of all the three national syllabi are included and integrated into the comprehensive syllabi.

- 3) Use the Entebbe Mathematics Basic Concepts I-IV as the central core of adaptation.
- 4) Use materials from the Primary Series to initiate activities and promote methodology.
- 5) Use materials from the Secondary C Series to reach greater depth.

In all the Training Colleges quite often there are different tutors for subject and methodology. We think this is a situation which should be arrested and it is the firm opinion of the group that the period for methodology in mathematics should be included under mathematics. Thus a tutor should teach "how to teach" at the same time as he teaches the students what they learn and what they are likely to teach.

The first volume is divided into eleven chapters:

- 1) History of Mathematics
- 2) Basic Set Operations
- 3) Descriptive Geometry
- 4) Number and Numeration
- 5) Whole Number Arithmetic
- 6) Rational Numbers
- 7) Real Numbers
- 8) Arithmetic Relations
- 9) Algorithms
- 10) Applications of Real Numbers
- 11) Theory of Numbers

The first chapter is meant to acquaint the students with the fact that mathematics is a human invention, and that this invention is still continuing. We mention a few of the great men who have helped to develop mathematics in the hope that this will help students see some relationship between the simple mathematics they learn and the great inventions of the past.

In Chapter Two we discuss sets and basic operations on sets partly in the hope of linking this with basic Operations on Whole Numbers.

We have introduced geometry early in this text for many reasons. Geometry featured quite early in the development of mathematics. Further, we

think that an early introduction, particularly using an intuitive approach, helps the teacher to develop ability to make generalisations or simply logical deductions from familiar physical objects to the idealised concepts.

Our system of numeration is interesting and crucial to the understanding of numbers; this is an area of intensive teaching at the primary level and as much as possible we clearly enunciate the principles involved as well as include several activities that should assist the prospective teacher to help children discover the concept of number and the principles of numeration.

In the chapter on Whole Number Arithmetic, we discuss the basic operations of arithmetic emphasizing its structure.

Chapters six and seven on Rational and Real Numbers serve to expand understanding of numbers and further the basic operations enunciated with regard to Whole Numbers. The chapter on Arithmetic Relations is the first attempt to generalise arithmetic. Here we discuss problems which are normally introduced at the Secondary School level, equations and inequations. We also discuss the concept of function to introduce the topic from a very elementary level.

The techniques involved in adding, subtracting, multiplying and dividing are better learned when the principles on which these are based are understood. This is why we discuss the Algorithms only after we have spent considerable time discussing the structure of Arithmetic and have covered sufficient work on the Real Numbers. As much as possible these Algorithms are shown as emanating from the basic principles.

In the applications of Real Numbers we have introduced short discussions on topics like ratio and proportion, interest, discount and last but not least, Logarithms and Indices. Some of these are traditional topics, but we hope our treatment will help the students teach them as a series of rules.

Indices and Logarithms are departure which a bright student might find very useful.

In the chapter on Theory of Numbers, we hope to give the students an opportunity to explore and experiment in a fascinating field of study. We hope to generate an interest in Primes and Divisibility tests and help to show mathematics as a study that could be pursued for its own sake.

In the second volume we intend to concentrate more on pure mathematics as opposed to methodology. The chapters will include:

- 1) Geometry (involving axioms and proofs)
- 2) Functions (with more work on trigonometric functions)
- 3) Statistics
- 4) Probability
- 5) Motion and Geometry
- 6) Topology

Each of these topics will be treated so that the very elementary principles in each are compulsory; the amount of compulsory mathematics should be necessary and sufficient for primary school mathematics. However, we are aware that advancement for the primary school teacher is at present tied to his ability to secure a pass in some teaching subjects at the West African School Certificate level. Therefore, it is necessary to include material that would enable the ambitious teacher to reach a higher level in mathematics. Thus we envisage that about half the materials in the second text may be optional. However, this should in no way hurt the less ambitious student who may be able to cover only the compulsory exercises.

The first completed volume will be tried out in a few schools in the course of the year. We hope to make certain changes as a result of these trials and the recommendations should assist in writing the second volume.

Dr. Grace Alele Williams
School of Education
University of Lagos
Lagos, Nigeria

W.A.R.M.P. - TEACHER TRAINING GROUP

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Report
of the
Secondary Writing Group
West African Regional Mathematics Programme

BACKGROUND AND OBJECTIVES

When the Entebbe Mathematics Programme began in the Summer of 1962, the now world-wide movement to modernize the content of pre-university mathematics curricula and to reform accordingly the methods of teaching was very much in its infancy. Most of the now well-established programmes in the U. S. and the U. K. had only just been initiated. The wind of change was yet to reach Africa.

Now, some nine years afterwards, we encounter a completely different picture. Numerous experiments aimed at modernizing the mathematics curriculum and teaching of the subjects have been undertaken and Africa can boast of some half a dozen such experiments either completely initiated from within the continent itself or adapted from others initiated elsewhere.

What we may describe as the first phase of most of these experiments is now over. Roughly, this is the phase where one puts between "hard" covers texts for the entire school course(s).

It is time now to take a critical look at the results of one's efforts and to compare them with those achieved by others. Already the texts have been subjected to the acid test of being taught in the classrooms. This test is quite crucial for any programme, but much more so for one like the Entebbe, where it was not possible to try most of the material in this way before it was put into "hard" covers.

Specifically, for the secondary course, there is the thorny problem of what approach to geometry one should adopt. Of the various possibilities, Entebbe had roughly speaking chosen to teach Euclidean geometry with Euclid's deficiencies made up after a fashion. There had also been some hand waving in the direction of transformation geometry. Was one satisfied with this choice or was a different approach called for?

ADAPTATION PROCEDURE

The first few days were spent in a quick perusal of the Entebbe texts for the first two years as well as those for the J.S.P. and S.M.P. (The ground covered would, of course, be only approximately the same, so that one had occasionally to look at some material for the upper years.) Other programmes and texts were also available for consultation.

There was a general discussion as to what should go into the first year. Apart from the texts, we also had some teaching syllabuses to help us in this task. The first decision taken, without any dissenting voice, was that the separation of the material into a Geometry and an Algebra text was most unfortunate. To give only some of the reasons for this decision:

1) The separation of the texts worked directly against the spirit one was encouraging in the pupils to look on mathematics as one area of human endeavour with its particular methods and techniques, and not to create gulfs between its various sub-disciplines.

2) With the separation of texts, one might even have in some schools different teachers teaching Algebra and Geometry and treating these as distinct disciplines.

3) Even where the two were taught by the same teacher, he might find some difficulty with drawing up the year's programme of work, if he was new to the materials.

A tentative sequence of topics and chapter heads for the year was then agreed on and the group divided into two: one subgroup to draw up detailed recommendations on the adaptation, rewriting, etc., of the Algebra text and the other to do the same for the Geometry.

It had also been agreed that the elementary statistics and probability in the entire Entebbe course was rather meagre. This was to be remedied and the first year was to include a chapter on the Collection and Organization of Data.

It had been planned to draw up the programme for the second year before we started on the main task of adaptation and re-writing. But when we got down to the detailed discussion of the first year work in geometry, it became all too apparent that we couldn't go further without grasping the nettle mentioned earlier on in this report - what approach to take to geometry. Most of the participants were really appreciating the full dimension of this problem for the first time. It was decided then that the period of the workshop was too short to attempt to grapple with the problem. A tentative programme was accepted for the second year algebra, and eventually some rewriting and adaption was done.

Actually, we didn't feel that it was any loss not having worked out a complete second year text. Discussions with school teachers at the workshop and outside had revealed that it would be difficult to get teachers to try out the second year material on pupils who had gone through a different first year course.

THE CHANGES MADE AND DIVERGENCE FROM ENTEBBE

The Entebbe texts we worked on were the C-series. These had been written for a 4-year course. Since the secondary school course in the countries involved was a 5-year one, we had to stretch out the books to cover the 5-years. (Liberia, we were told, would easily make the necessary adjustments as to the grades at which to start the materials.)

It turned out that we had enough material in the C-One Algebra to cover the first two years. This is perhaps not too surprising since this text was based on the first two years of the "regular" Entebbe Series.

It is generally accepted that the Entebbe texts tend to be very wordy. One of our main concerns was to correct this weakness.

Secondly, with the texts now intended to be used primarily in Sierra Leone, Liberia and Ghana, we altered examples and illustrations where necessary, so that they would be more meaningful to the pupils.

On the whole the changes in Algebra were not very extensive. It was by and large a reorganization of the texts rather than anything else. For example, the first chapter on "Sets and Number" was drawn out of the first sections of Chapter One and most of Chapter Two. The remaining sections of Chapter One were expounded into the Chapter, "More on Sets".

The story is rather different with Geometry. Here our strategy was to develop a lot of intuitive geometry and to get the pupils to acquire proficiency in simple geometrical constructions. This would leave the field open for any approach to be adopted later.

Again, the Entebbe Series had adopted a quasi-abstract approach, building up lines, line segments, planes, and so on from points. We decided to work in the opposite direction - start from solids and take them apart to produce the planes, surfaces, lines, points and so on.

We used the Entebbe material where we could, but generally we had to write new material.

The participants worked very well, and considering that most of them were trying their hands at this game for the first time, the quality of the output was quite acceptable.

If possible, the participants ought to have some preliminary exchange of views by correspondence on the Geometry before the start of the next Workshop.

D. K. Abbiw-Jackson

Awadagin Williams

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

Report

of the

First Summer Workshop

University of Nairobi, Kenya

July 26 - September 4, 1971

PREPARATION

On its January 11, 1971 meeting the Management Committee resolved that a six week Workshop, from July 26 - September 4, 1971 be held. The Workshop was designed to adopt a Teacher Training College Text based on the Entebbe Basic Concepts of Mathematics Volumes and the syllabuses of the two Ministries. The writing group was to consist of:

- (a) A Chairman and consultant
- (b) Four people: Local Training College Tutors or Mathematics Supervisors; two from each country
- (c) The Mathematics Educator and the Mathematics Editor/
Educator
- (d) The Program Administrator and a Workshop Secretary.

Both Ministries were requested in early March 1971 to nominate their respective participants to the Workshop. The Ethiopian Ministry nominated Ato Girma Mengistu and Ato Aberra Waqqira both of the Mathematics Department of the Ministry as Trainee Evaluator and Trainee Editor respectively. Subsequently the Program was informed that Ato Girma could not participate because of pressing work at the Ministry and was replaced by Ato Tadege Gebre Medhin, a Teacher Training Institute Teacher.

Early in April 1971, the Kenyan Ministry informed the Program that Mr. G. Kimote of K.I.E., Nairobi, and Miss Sushila Bakhda, a Teacher Training Tutor of Shanzu Training College, Mombasa, were tentatively nominated as possible Trainee Evaluator and Trainee Editor respectively.

The site of the Workshop was left to the discretion of the Administrator in consideration of reasonable cost and availability of facilities. The Administrator, therefore, explored possibilities in both countries. In Ethiopia, though classroom facilities were satisfactory, residence facilities were either below the standard of the Workshop group or above Program funds.

In Nairobi, some Colleges and High Schools do have adequate residence facilities; however they were either closed or were operating at full capacity for in-service courses at the time of the Workshop. With the kind assistance of Mr. Isaac Hunja, however, we were assured of residence facilities at the United Kenya Club and of classroom and reproduction facilities at nearby University of Nairobi.

Mrs. Eileen E. Bowman who had been a very efficient typist at our earlier Nairobi Institute was requested to be Workshop Secretary and agreed.

The syllabuses of the two Ministries were secured. The Kenya syllabuses were under review at the beginning of the Workshop and we were able to secure revised copies just in time.

Entebbe Mathematics books and materials sent by EDC as well as locally available ones were lined up ready for the Workshop.

On July 18, one week before the Workshop date, the Administrator went to Nairobi to make sure that everything was in order for the Workshop to start and operate as smoothly as possible. Special effort was put up to the best ability of the Administrator under the circumstances, to ensure that the writing group would in no way be obstructed by Administrative inefficiency.

ARRIVALS OF THE WRITING GROUP

On July 24, 1971, Professor John W. Green, the Chairman of the Writing Group, arrived at the United Kenya Club. The next day Professor Roy Dubisch, Maths Editor/Educator, the two Ethiopian participants, Ato Aberra Waqjira and Ato Tadege G/Medhin and Miss Sushila Bakhda the Kenyan participant from Mombassa arrived. All Workshop participants except Mr. John Fitzgerald, Mr. G. Kimote and Mrs. Bowman who were residents in Nairobi were booked at the Club for full board. On the same day, the Management Committee Members arrived and those who had asked to stay at the Club were given full board facilities.

OPENING OF THE WORKSHOP - JULY 26, 1971

As previously arranged, Mr. H. Kanina, Chief Inspector of Schools, was to make the opening address. On July 26, 1971 at 9:00 a.m., Mr. H. Kanina addressed the group.....and declared the Workshop open. Most of the members of the Management Committee were present at the opening session.

Thereafter the writing group continued with their first meeting and agreed upon their working timetableDr. Edward Jacobsen was on leave at the beginning of the Workshop and when he returned he was so busy with other teaching duties that he was unable to assist as much as anticipated.

The Management Committee Meeting took place July 27, 1971.

WRITING PROCEDURES

The writing group reviewed the syllabuses of the two Ministries (Kenyan and Ethiopian Ministries of Education), the four Entebbe Basic Concept Volumes, the Hand Book for Primary Teachers and other reference sources. They then selected relevant topics and made tentative arrangements of chapters. A number of chapters were assigned to a couple of the writing group members. Each chapter had to pass the following steps:

1. First Draft: Mainly consisted of cuttings, pastings, deletions and handwritten additions.
2. Editing: First draft passed to Editor for correction; he made necessary comments and suggestions.
3. Second Draft: The Editor's comments and suggestions were given back to the group for review and to make the necessary changes.
4. Xerox: The second draft was reviewed, typed and Xeroxed (four copies).
5. Group Review: The Xerox copy was discussed by the group; often only minor changes were made.
6. Final Draft: The reviewed copy was retyped and Xeroxed in two copies and this constituted the final draft.

All these steps were charted on the chalk-board by the Editor and the Administrator could easily observe the daily progress.

It should be pointed out that at all these steps there were group discussions as the need arose.

The final draft of "Fundamental Concepts of Mathematics for Primary School Teachers" came out to be eighteen chapters of four hundred and two pages excluding the front matter which is ten pages.

DR. BERNARD J. SHAPIRO'S VISIT

Dr. Shapiro, the Consultant evaluator of the Program, paid a visit to the Workshop from August 8-12 and on August 17, 1971. He had discussions with the Administrator, with the Workshop leaders and participants separately.

His discussions were centered on the evaluation program which covered Institutes, Correspondence Courses, the Workshop and Trainee Evaluators as well as on the trial edition of the new book. On this latter subject, Dr. Shapiro prepared a Teacher's Questionnaireto be given out with the trial books.

SECRETARIAL WORK AND REPRODUCTION

Mrs. Eileen E. Bowman, the Workshop secretary, came with her own typewriter on rental basis to which we had a guide fixed. In spite of the fact that she had to do all drafts and final copies as well as routine correspondence work she proved herself as a well qualified mathematics typist. At times her workload was so heavy that she had to work off Workshop hours.

The University of Nairobi had kindly lent us a typewriter free of charge and permitted us to use their duplicating and Xerox services at reasonable cost.

OTHER WORKSHOP EVENTS

Get-Togethers

1. On the evening of July 26, 1971, the Fitzgeralds entertained members of the writing group, Management Committee members and others at a reception at their home.

2. Professor John W. Green, the Chairman had to leave one week before the closing date of the Workshop (by this time the main job of the writing group, with the exception of editing and polishing, was completed). The writing group therefore with their families and Mr. Issac Hunja had dinner at the Club on August 25, 1971 on the occasion of the Chairman's departure.

3. Closing Meeting: On the afternoon on September 3, 1971, the Ethiopian Ambassador, Ministry and University officials, press men as well as the Writing Group with their families were invited and refreshments were served at the University cafeteria.

The Press

The Nairobi Press was constantly informed of our activity. The Daily Nation had even sent a reporter and Professor Green and the Administrator were interviewed. However, in spite of their promise to cover us on a wider scale, nothing came out on their papers.

The Voice of Kenya, (VOK) Television Programme had a live ten minute T.V. interview with Professor John W. Green, Mr. G. Kimote and Ato Tadege G/Medhin on their Mambo Leo (Daily Event) Program on August 26, 1971 at 6:00 p.m.. The questions and answers involved the nature of the Workshop, kind and utility of the book under script, advantages of modern maths over traditional, teaching problems and the possibility of publishing the book into the vernacular languages (Swahili and Amharic).

Excursion Trips

Members of the writing group had several trips arranged at their own expense. In addition, the Fitzgeralds and Mr. G. Kimote kindly took the group to Lake Naivasha in their own cars.

CLOSING OF THE WORKSHOP AND DEPARTURES

As already mentioned, Professor John Green had to leave one week earlier, on the evening of August 27, 1971.

The Workshop was formally closed on the evening of September 3, 1971 after the refreshments. All business affairs and accounts were settled on this same evening and the writing group departed on the morning of September 4, 1971.

PRINTING OF THE TRIAL EDITION

The book had to be put for trial in both countries this year for the final publication next year. Since the Kenyan school year starts in January we had ample time to supply the Kenyan trial colleges. However, the Ethiopian school year starts on September 29, and if we were not able to supply the book to the Ethiopian Institutes at about this date the trial had to be postponed for another year. Special effort was put up, therefore, to get the book reproduced in time.

First Gestener reproduction was considered. This was rejected, however, on the following grounds:

1. Such reproduction could not be done under six weeks (we had only two weeks by then for schools to reopen)
2. The cost was no less than printing
3. The quality (neatness) would be poorer than printing.

Inquiries regarding cost and delivery time were made at the Berhanena Selam H.S.I. Printing Press and another press. The second press came out to be not so competitive in both price and delivery time. The job was therefore given to Berhanena Selam H.S.I. Printing Press and completed under two weeks. The Addis Ababa H.S.I. Teacher Training Institute and the Debre Berhan Teacher Training Institute had copies of Fundamental Concepts of Mathematics for Primary School Teachers delivered when school started. The approval for trial from the Ministry and Dr. Shapiro's questionnaire have also been sent with the books.

AMENDMENTS

Although the fore-pages including the inside cover page, the acknowledgements, the foreword and content pages were sent to EDC by the Editor for approval, the Administrator had not informed EDC of the printing of the book because of the urgency of the case. When Mr. John Joanou, the Associate Director of the African Mathematics Program arrived in Addis on September 29, 1971 he found out for the first time that the book was printed. He therefore made some amendments to the fore-pages. The old fore-pages shall therefore be ripped off and replaced by the amended ones.

PROBLEMS

Problems of the 1971 Nairobi Summer Workshop were minimal. However, the very few we had should be pointed out.

1. Materials

Certain technical materials were not available locally though the Administrator was informed, before the Workshop, that they were available. However, Mr. John Joanou, the Associate Director of the African Maths Program had wisely decided to send most of the material needed. Only the guide for the typit was not sent because of lack of knowledge of the kind of typewriter to be used. It was very difficult to find this and when it was found the price was exorbitant (sh. 240 cost and fixing).

2. Dislocation Allowance

At about the same time as our Workshop, other similar activities were going on in Nairobi. It was alleged that other Institutions were paying their participants higher allowances, medical expenses and excursion trips. Our participants came to know of these arrangements and requested the Administrator either to take action himself to improve their financial situation or inform EDC about it. They were informed, however, that their dislocation allowance was decided by the Management Committee and that neither the Administrator nor EDC could alter the situation at the time with such irrelevant argument namely, competition with other Institutions.

Finally, the Administrator earnestly hopes that Professor John W. Green, the Chairman, who ably guided the writing group and often brightened us with his wise jokes shall be able to be with us for the coming Workshops.

Makonnen Eunatu
Administrator
East African Regional Mathematics
Program

PARTICIPANT LIST AND SCHEDULE

1971 Nairobi Summer Workshop

A. STAFF

Prof. John W. Green - Workshop Chairman and Head of the Teacher
Training Text Writing Group, Mathematics
Dept., University of California, Los Angeles
Prof. Roy Dubisch - Editor/Educator, EARMP (on leave from University
of Seattle, Washington)
Mr. John Fitzgerald - Maths Educator, EARMP
Dr. Edward Jacobson - Math Dept., University of Nairobi

B. WRITING GROUP

Miss Sushila Bakhda - Shanzu Teacher Training College, Mombassa,
Kenya
Mr. Tadege Gebremedhin - Haile Selassie I Teacher Training Institute,
Addis Ababa
Mr. Gideon M. Kimote - Head of Mathematics Section, Kenya Institute
of Education, Nairobi
Mr. Aberra Waqjira - Mathematics Department, Curriculum and Teaching
Materials Division, Ministry of Education and Fine Arts
Addis Ababa

C. ADMINISTRATION

Atc Makonnen Eunatu - Program Administrator
Mrs. Eileen E. Bowman - Workshop Secretary

OTHER INFORMATION

1. Members of the Group from outside Nairobi shall reside at the United Kenya Club.
2. The Workshop shall take place at the Nairobi University new Education building, room numbers 101 and 102.
3. On Monday, July 26, the Group shall meet in room no. 101 at 8:30 a.m.
 - a) Books and other supplies shall be given out.
 - b) At 9:00, Mr. H. Kanina, Chief Inspector of Schools of the Kenya Ministry of Education has kindly consented to address the group.
 - c) After the opening address, the group shall meet and draw up the timetable of the Workshop.
 - d) On this same evening, Mr. Fitzgerald has kindly invited the group for a get-together at his home.
4. Participants of the Workshop may draw their weekly dislocation allowances from the Administrator, off Workshop hours.
5. The University Library has kindly agreed to let us use their mathematics section for reference purposes. Members of the group who intend to do so please inform the Administrator.
6. Workshop hours, Monday through Friday
 - 8:15 a.m. - 12:45 p.m. (brief coffee break at 10:15)
 - 2:00 p.m. - 4:30 p.m.

ADDRESS BY MR. HERBERT J. KANINA

Chief Inspector of Schools
Ministry of Education, Nairobi, Kenya

at the
Official Opening
of the

SUMMER WORKSHOP
EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME

Education Development Centre through its African Mathematics Programme has been active during the last decade to introduce and develop the teaching of modern mathematics in our continent. E.D.C.'s effort and that of the funding institutions has been rewarding and encouraging.

Since 1962 several Leadership Institutes and Workshops have been run. Numerous textbooks, known as Entebbe Mathematics Series, have been published and made available for African Schools. With this manpower and these teaching materials the new approach has been and will be introduced in several African primary and secondary schools.

We are now moving into a new phase in modern mathematics programming in three ways:

- 1) We are now cooperating on the regional level instead of the continental one. Consequently, we now have the East African Regional Maths Programme which includes Kenya and Ethiopia, and its counterpart, the West African Regional Programme, composed of Ghana, Liberia and Sierra Leone.
- 2) Up to now we have been dependent on E.D.C. for our manpower and textbook production whereas from now on we shall try to produce our own regional machinery for manpower and textbook production, with E.D.C. as our guiding supervisor, until such time that we shall be able to stand on our own feet.
- 3) The new programme is basically a primary school programme which we feel is logical to cover primary schools by stages.

This does not, however, neglect secondary schools since a proper introduction of the new approach in primary schools is also laying a sound foundation for secondary schools. Besides, we will at the same time evaluate our secondary school programme and synchronize it with our primary school programme. It was with these facts in mind that the East African Regional Mathematics Programme (EARMP) was established. This programme will, therefore, run Institutes, Workshops and specialized editing and evaluating courses to directly or indirectly produce the necessary teaching manpower and the relevant teaching materials.

To this end the Regional Programme has already run two Institutes, one in Kenya and another in Ethiopia for Teacher Training College Tutors and Supervisors. The participants of these Institutes who are now following correspondence courses will be called upon to participate in a second Institute and finish off with another year's correspondence course. A new group will then go through the same process for similar two years period. However, these participants are not waiting and will not be waiting for certification; they are now, and will continue to be, active in giving pre-service and in-service courses and other necessary guidance in modern mathematics.

You, participants of this workshop, are expected to ease the burden of Teacher Training College tutors by producing for them suitable teaching materials. To come out with a meaningful text you have the arduous task before you of anticipating every possible problem that may confront teachers and students alike. Even after you have produced an appropriate text your effort does not end there and then. It is hoped that you will come out with substantial gains from this workshop to enable you to become our future editors and evaluators with further guidance in these specialized fields. I am sure you are under very good guidance and I hope you will live up to our expectations.

Finally I would like to express our deep gratitude to U.S.A.I.D. and to E.D.C. for their timely assistance and cooperation in the Programme in general and for this workshop in particular.

REPORT BY PROFESSOR JOHN W. GREEN, CHAIRMAN
TEACHER TRAINING GROUP
1971 NAIROBI SUMMER WORKSHOP
EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

I. As Head of the Writing Group

a) What Was the Objective?

The charge was to produce one volume and, if possible, all or part of a second volume of text material suitable for the mathematical instructional program in Teacher Training Colleges for primary teachers in Kenya and Ethiopia. To the maximum extent possible, the material was not to be written from the beginning, but was to be adapted from existing Entebbe sources, primarily the Basic Concepts of Mathematics volumes and the Handbook for Primary Teachers.

A considerable amount of time was spent examining the syllabi of the Teacher Training Colleges in Kenya and Ethiopia in order to see how material could best be prepared to be used in both countries. In Kenya, some candidates enter Teacher Training College with only a primary school background (though frequently after some experience in uncertified teaching positions). These candidates, known as the P3 group, when they become teachers, frequently teach in the lower grades of elementary school. In both Kenya and Ethiopia, candidates also enter Training Colleges after all or most of secondary school. It was anticipated that this textbook could be used through all or nearly all of the two years of the training of this group. It could also be used as the foundation of the training of the more advanced groups in both Kenya and Ethiopia for whom additional text material could be prepared in 1972 if a Workshop is held then.

(b) Adaptation Procedure

This can best be described by quoting from a report by Professor Roy Dubisch, the Editor for the project.

"Once our outline was prepared, we split into 3 groups, plus myself as editor. The teams were:

Tadege Gebremedhin and John Green (T-G)
John Fitzgerald and Gideon Kimote (F-K)
Aberra Waqjira and Sushila Bakhda (A-B)

Chapters were then assigned to these teams (with a certain amount of changing of assignments as we went along). The work then proceeded as follows:

1. Each team produced a first draft.
2. I went over this first draft and then discussed with the team the suggestions I had for changes, additions, and deletions. Here and at other times when I discussed proposed changes, I emphasized that I was not trying to assume dictatorial powers and that the team could certainly question my judgement. In most cases, my criticisms seemed to be well received and were certainly acted upon; in some cases, I changed my own mind as a result of our discussion; in a few cases, we had a group discussion on a point and adopted majority opinion; and on several occasions I (with Green's concurrence) had to be seemingly somewhat arbitrary in the interests of mathematical correctness.
3. A second draft was then prepared by the team and again I read. This time, unless some major re-writing was needed, I took it upon myself to make various small changes here and there in the interests of uniform format, punctuation, and the like since the team would see the manuscript again.
4. We then had 4 Xerox copies made of the cut and paste job (Basic Concepts and Handbook material with errors corrected and various words changed, plus new material), one for each team and a master copy for me.
5. Each person then received this second draft and commented on it.
6. I looked over these comments and then called on each team to discuss their comments. Many suggested change I accepted without question; others were accepted with changes after discussion. In cases where I felt the suggested changes were inappropriate or incorrect, I tried to explain why. The very few changes were handled, as in the first draft, by group discussion or by Green and me on the basis of mathematical correctness.
7. On the basis of the group reviews, I prepared final manuscript for typing.
8. The typed final manuscript was checked and the illustrations put in by the trainee editors (Aberra and Bakhda). They also read

the material carefully for errors especially in regard to cross-references. (Especially important when the book is written in "pieces".) Stencils will be made from this final copy by an electronic process."

(c) Where is the Real Divergence from Entebbe?

If the group was successful in what it attempted to do, there should be no philosophical divergence from Entebbe. A great deal of the material is Entebbe material with only minor editorial changes. Connective, adaptive and new material was prepared with the Entebbe background much in mind.

(d) The Changes Made

Several things rendered the Basic Concepts texts less than completely satisfactory for use as a textbook for Teacher Training Colleges in Kenya and Ethiopia:

- i. Length (4 volumes).
- ii. Arrangement of topics. The first two large volumes were altogether on arithmetic; informal geometry, which now appears early in the P3 syllabus, only occurred in later volumes.
- iii. The use of the British system of measurement instead of the metric system.
- iv. Absence of some topics now in the various syllabi, such as motion geometry.
- v. Various features due to the fact that the volumes had been prepared for possible use in any or all of some ten Africa Countries, spread widely over the Continent, involving many languages, cultures, vocabularies, currencies, etc.

It soon became apparent that in adapting portions of Basic Concepts and other Entebbe materials for the present use, it was not going to be possible to use anything in its existing format - making use, for example, of photographic reproduction. Even in the case of chapters that were used almost in entirety, The necessary changes related just to pagination, references, systems of measurement and currency, etc., would have required the retyping or resetting of every page. Also, producing a somewhat briefer text covering all the topics of Basic Concepts, plus other topics required making very many deletions and changes. So there were indeed a great many changes; many were small, but others were extensive. In some cases it was not possible to shorten the treatment of a topic by deletions here and there; the topic had to be rewritten. Also there were quite a few additions; most of the sections on geometry had to be extended because of demands of the new syllabi. Another example is to be seen in the treatment of measurement, which had to be largely redone because of the decreased emphasis on the British system of units that has occurred in recent years.

(e) Quality of Output

This, only time, review by experts, and trials can tell. However, if what was produced in 1971 is regarded as a preliminary version, it should serve very adequately, after trial, as the basis of an excellent final text.

(f) Outstanding Participants See (a) under II following.

II. As Chairman of the Workshop

(a) The Reaction of the Participants - Their Capabilities and Enthusiasm

All the participants joined in the work of the writing session with enthusiasm. Of course, because of personality differences, some entered into arguments and discussions more vigorously than others, and were more aggressive in inventing and developing new tasks and projects; but in my opinion, there was none who did not contribute to the program wholeheartedly and with concentrated effort. As a whole, I think we were very fortunate in having in such a small group such a variety of different interests and abilities; abilities that complemented one another very successfully. Of course the central figure was Professor Dubisch; he possessed the real expertise without which the project would not have gotten off the ground. Mr. Fitzgerald with his broad educational background in Africa and elsewhere, was of great help, not only with his technical ability, but also with his general good advice and judgement. Mr. Kimote's detailed and accurate knowledge of the Kenya primary curriculum and of the teaching methods and problems in Kenya schools was invaluable. Miss Bakhda had the most familiarity with the mathematical content of the Basic Concepts and other Entebbe materials. Mr. Tadege was refreshingly inventive and independent in his approach to the work and was besides an extremely pleasant person to work with. Mr. Aberra, after perhaps a slow start getting used to things, seemed to have found his niche later on when editing the final manuscripts.

Because of the decision to work this summer on the basic material for the Kenya P3 syllabus, the two Ethiopian participants did not take as large a part in policy-making matters as did the two Kenyan participants. However, if a 1972 Workshop should be devoted to additional text material for the Ethiopian and more advanced Kenyan teacher candidates, this situation might easily, and possibly should reverse.

Mr. Makonnen, as administrator of the Workshop, supplied us with all the material and services we asked for. Also, in the public relations area, he arranged for an interview with the Daily Nation and also an interview on the Mambo Leo (Events of Today) on VOK television. Mrs. Bowman was an extraordinarily efficient mathematical typist and produced beautiful typescripts about as fast as the seven of us could produce copy.

Finally, I should acknowledge the volunteer participation of Dr. Edward Jacobsen of the University of Nairobi, who generously assisted in some of the sections on geometry.

(b) Is This Really an African Writing Group? Could They Do the Work on Their Own?

Of course it was not a wholly African Writing Group. The African participants did about half the work, but the chief mathematical and editorial discretion was exercised by the non-Africans. However, it was more nearly an African Writing Group than the previous Entebbe Workshops I have seen. I do not think the African participants alone could have quite put out a satisfactory product; they lacked both editorial expertise and mathematical sophistication. But with this summer's experience, that group might well come close to being able to do such a task alone; their greatest need would be for someone with deeper mathematical background.

E A R M P

East African Regional Mathematics Program
Ministry of Education, Addis Ababa, Ethiopia

Telephone 16708

P. O. Box 30278

M E M O

Sept. 30, 1971

To: Mr. John Joanou, Associate Director
African Maths Program

From: Makonnen Eunatu
EARMP Program Administrator

Subject: Workshop Publicity

The Nairobi press was constantly informed of our activity. The Daily Nation even sent a reporter, and Professor John Green was interviewed. However, nothing came out in their paper.

The Voice of Kenya, Television Program, had a live 10-minute T.V. interview with Professor John Green, Mr. G. Kimote and Ato Tadege G/Medhin on their Mambo Leo (Daily Event) program August 26, 1971 at 6:00 p.m. Questions and answers involved nature of the Workshop, kind and utility of the book under script, advantages of modern maths over traditional, teaching problems and the possibility of publishing the book in the vernacular languages (Swahili and Amharic).

Eight Ministry of Education and two University Officials, the Ethiopian Ambassador and four press, radio and T.V. people were invited at the closing session. Only two Ministry Officials and a T.V. man showed up.

MANAGEMENT COMMITTEE MEETING OF THE WEST AFRICAN
REGIONAL MATHEMATICS PROGRAMME

PLACE OF MEETING: Fourah Bay College, Sierra Leone

DATE OF MEETING: July 22, 1971

TIME: 9:00 a.m.

PRESENT: Dr. A.T. Thomas (Ministry of Education, Sierra Leone)

Mr. C.E.A. Noah, Secretary, Institute of Education
(Representing the Director)

Dr. A. Doris Banks-Henries, Dept. of Education, Liberia

Mr. S.O. Bortei-Doku, School of Education, U.C.C.C., Ghana

Prof. A. Williams (Sierra Leone) African Maths Programme

Dr. D.K. Abbiw-Jackson (Ghana) African Maths Programme

Mr. Hugh P. Bradley (EDC) Director, African Maths Programme

Prof. W.T. Martin, Massachusetts Institute of Technology
Chairman, African Maths Programme

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

OBSERVERS: Mr. Solomon Russell, University of Liberia

Dr. T.J. Forde, Director Designate, Institute of Education
Sierra Leone

Prof. N.D.J. Smart, Head of the Dept. of Education, Fourah
Bay College, Freetown, Sierra Leone

Mr. J.S. Lenga-Kroma, Ministry of Education, Sierra Leone

Mr. John Joanou, (EDC) Associate Director, African Maths Programme

THE FOLLOWING WERE IN ATTENDANCE FOR MOST OF THE MEETING:

Mr. J.T. Norris, Maths Educator, WARMP

Mr. J.W. Alexander, Maths Educator, WARMP

Mr. Roger Hartman, Editor, WARMP

The Faculty of Education, University of Liberia and the
Principal Secretary, Ministry of Education, Ghana, notified their
inability to send representatives due to staffing stringencies.

SELECTION OF CHAIRMAN

It was decided not to elect an African Chairman owing to the absence of representatives of the Ministry of Education, Ghana, and the Faculty of Education, University of Liberia. Following a motion by Dr. A.T. Thomas seconded by Dr. Abbiw-Jackson the meeting unanimously agreed that Prof. W.T. Martin should be Chairman for the meeting. On the Chairman's suggestion members and observers introduced themselves to the meeting.

The meeting then approved the Agenda. Thereafter, Mr. Hugh Bradley sought and was granted permission to speak before business on the agenda started. Mr. Bradley thereupon announced his impending resignation from EDC effective from September 1, 1971. The meeting was sorry to hear of Mr. Bradley's resignation. The Chairman, Prof. Martin, paid warm tribute to Mr. Bradley's performance as Director of the African Maths Programme from its inception to date and recorded his personal appreciation of Mr. Bradley's initiative and creativeness and his immense contribution to the work of the Programme. The meeting unanimously associated itself with the sentiments expressed by the Chairman and expressed the hope that Mr. Bradley would not abruptly sever his connections with the Programme. On a motion by Dr. Banks-Henries, seconded by Mr. Bortei-Doku, Mr. John Joanou was unanimously elected to the Management Committee to replace Mr. Bradley. It was also agreed that Mr. Hugh Bradley should retain his present position as a member of the Management Committee until December, 1971.

STATUS AND MEMBERSHIP OF MANAGEMENT COMMITTEE AND RELATIONSHIP WITH MINISTRIES

The meeting next discussed the subject of the Status and

membership of the Management Committee and its relationship with the Ministries of Education. The membership of the Management Committee was designed so as to give decisions of the Committee standing and authority in the area of Maths education in participating countries. As such, it was imperative that persons nominated to represent the Ministries and Departments of Education at Management Committee Meetings should be people of responsibility with knowledge of their Ministry's/ Dept.'s policy on mathematics education.

RELATIONSHIP WITH THE WEST AFRICAN COUNCIL FOR TEACHER EDUCATION

(WACTE)

A document entitled "Proposals for a working relationship with WACTE" (Appendix 1) prepared by the Committee of three set up at the last Management Committee meeting in January, 1971, was distributed. The meeting was informed that this document had been circulated to Members of WACTE for comment and suggestions by that Council's Executive Secretary. It was understood that a meeting of WACTE or its Executive was shortly to be held in Ghana and it was hoped that a decision on the matter would be taken at that meeting.

The meeting discussed and endorsed the draft proposals and agreed to amend item 3 by substituting "in consultation with the Management Committee will...." for "might" in the first line. Item 3 should then read as follows:

"The WACTE in consultation with the Management Committee will hire an Administrative Officer whose primary responsibility would be to service the WARMP Management Committee."

MATHEMATICS EDUCATORS

It was agreed to take item (vi) (b) "Maths Educators", at this

point since Messrs. Norris and Alexander, the Maths Educators and Mr. Roger Hartman the Editor had been invited and would be in attendance shortly. The Maths Educators were engaged for a two-year period terminating in August, 1972. Suitable candidates as regards qualifications and otherwise were not easily come by. It was necessary therefore to know well in advance if the Maths Educators intended to seek to renew their contracts. It was therefore agreed to request them to confirm by December, 1971, if they wished to continue and this was done accordingly.

VISITS OF MATHEMATICS EDUCATORS

The Maths Educator, (Njala) reported on his visits to participants in Sierra Leone, Liberia and Ghana. In Sierra Leone most of the participants were primary school teachers (rather than Training College Tutors) who had been admitted to the Institute on the understanding that they were likely to qualify for upgrading to Teacher Training College work in the near future. The Maths Educator recommended Mr. Gbondo, Mr. Tucker, Mr. Ngebeh and Miss Kombe-Kajue for consideration for upgrading to Teacher Training College work on the basis of their performance at the Institute and in the Correspondence Course and their work as observed by the Maths Educator during his visits. Correspondence Course papers were being sent to thirty participants in Sierra Leone who attended the January Institute. Twenty-three of these were required to return their work for marking. Of these only 16 have in fact sent in any work so far. During the discussion that followed it was emphasized that the Institute should aim also at training school inspectors and supervisors and experienced teachers who would in turn train the primary school teachers in the modern maths.

The Programme's work had been least fruitful in Liberia. Only four out of fifteen participants had sent in any work for marking, part of the reason being that about half or more of the Liberian participants were persons in jobs other than teaching. It was very unlikely that such persons could have any impact on the schools. Although the participants had prior notice of his visits, some of them were not available at their posts when the Maths Educator turned up. Also group meetings proved difficult to arrange.

In both Sierra Leone and Liberia the Maths Educator had difficulty in finding board and lodgings in several places.

The best results had been achieved in Ghana where all the participants had sent in work for marking and the scores had been very high. This was partly because all the participants were Training College Tutors and most of them specialize in teaching maths at their colleges. Prior arrangements had been made with the Colleges for board and lodgings and these were provided generously at all the places visited.

The Maths Educator drew attention to transportation difficulties he experienced in Liberia and Ghana since he could not take his car when he travelled to these countries from Sierra Leone.

VISITS TO PARTICIPANTS IN GHANA BY THE MATHS EDUCATOR, CAPE COAST

Participants were scattered in 27 colleges in three of the nine regions of Ghana and about 30 of them specialised in teaching maths at their colleges. Of 54 participants enrolled from the First Institute for the Correspondence Course, one had left teaching altogether. Another had entered the University and nine others had sent no work for marking because they had either stopped teaching the subject or else were not likely to continue teaching it in the future. As against eleven dropouts, twelve new participants had been recruited from the Colleges at various times

Country	Number of Participants at Institute	Late Additions	Observers	Correspondence Course Involvement	
				Number	Percentage
Sierra Leone	23		7	16	70%
Liberia	15			4	27%
Ghana	74*	11**		61	83%

* Eleven of this number dropped out of the Programme either because they stopped teaching mathematics or stopped teaching.

** These were replaced by the eleven Late Additions who did not attend the original Institutes so that the total number of Ghanaian participants eligible for the Correspondence Course is 74.

since the visits began and three others had been transferred from the surveillance of the Maths Educator (Njala) to that of the Maths Educator, Cape Coast for geographical reasons. As at May, 1971 there were 46 participants doing the Correspondence Course in the 27 Training Colleges under the Maths Educator, Cape Coast and 17 in 7 colleges under the Maths Educator, (Njala). The total number enrolled to date was 81 of whom 11 had dropped out for the various reasons stated above. Now and again individual participants had come out with bright ideas in methods of presenting various mathematical topics. These had been circulated to the other participants and had been a source of encouragement to them in their work.

The meeting approved the dropping of inactive participants and the recruitment of new ones. It recommended the use of mathematics clubs, where these exist, to popularise new ideas in mathematics. It suggested also that where possible unified Mathematics-Science programmes might be tried in the primary school. The meeting put on record its appreciation of the performance of the Maths Educators.

It was agreed that the reports of the Maths Educators should be circulated to Committee members.

The meeting was informed of a request to the Maths Educators by the Head of the School of Education, Cape Coast, to conduct a week-end course early in December, 1971 for Secondary School Teachers in the Modern Maths. The meeting agreed with the request and suggested the inclusion of School Inspectors and Supervisors if possible. The Programme was not to be involved in setting up the course. It should only help with instruction.

The Correspondence Course was discussed at some length. It was agreed that it imposed a considerable strain on the participants all of

whom were serving as teachers/tutors in full-time employment.

Some kind of incentives were required if the teachers/tutors were to be encouraged to keep up their interest and persevere through the course. It would be a good incentive if outstanding primary school teachers could be upgraded to teacher-training work on the basis of their performance in the Correspondence Course as had been recommended to Sierra Leone in respect of Messrs. Gbonde, Tucker and Ngebeh and Miss Kombe-Kajue. The meeting agreed also to request Ministries/Depts. of Education of Liberia, Ghana and Sierra Leone to consider granting incremental credits to participants who successfully completed the Programme's course. The Secretary was asked to write to the Ministries/Depts. (copies to management Committee members) on the subject of incremental credits.

LOCATION OF JACK ALEXANDER, MATHS EDUCATOR, (Njala)

Housing for the Maths Educator at Njala was still poor, inadequate and entirely unsatisfactory. In his reply to an appeal made to him by the Administrator (WARMP) the Registrar had betrayed no genuine concern in the matter. The Maths Educator reported that since a good deal of his work was in Freetown and he had also to stop there several times enroute to or returning from Liberia, Ghana and some parts of Sierra Leone, he had taken a house there and went only occasionally to Njala to collect his mail. It was agreed that in the circumstances the Maths Educator could not be asked to return to Njala.

The meeting discussed a proposal to locate Mr. Jack Alexander in Liberia during the academic year 1971/72. It was pointed out that the Programme was making little progress in Liberia mainly because many of the participants from that country were not teaching. The mere location of a Maths Educator in Liberia would hardly make any difference unless a reason-

able number of the right type of participant could also be made available to him to work with and try and bring them up to standard so that they could participate in the next Institute in January, 1972. It was noted that four times as many participants were doing the Correspondence Course in Sierra Leone as in Liberia and it was felt that the transfer of the Maths Educator from Sierra Leone could only be justified if it would considerably correct this imbalance. The meeting therefore decided that Mr. Jack Alexander should only transfer to Liberia if Liberia could get together 25 school supervisors for a four-day Institute to be conducted by the Maths Educator to prepare the supervisors to participate in the January Institute. This should ensure that there would be enough active participants in Liberia in 1971/72 to justify the transfer of Mr. Jack Alexander there from Sierra Leone.

Dr. Banks-Henries undertook to find the 25 school supervisors and inform the Administrator as soon as this was done. The Programme in Liberia is operating in the area of Dr. Banks-Henries responsibilities in the Dept. of Education.

At this point the Director of the African Maths Programme sought the meeting's approval for a delegation of the Management Committee to meet the authorities at the Ministry of Education in Accra about difficulties facing the Programme at the Executive level in that Ministry. This was granted.

EDITORS AND EVALUATORS

The meeting was told that the suggestion for the Training of Editors and Evaluators was made by the IDA representative at a meeting in Washington, the argument being that curriculum innovation should be a continuing process and as such the participating countries should train their

own personnel to make this possible. Thus each country was invited to appoint a counterpart Editor who would receive training locally under the Programme Editor and also visit publishing houses in the U.S. for a period of three months. It is anticipated at the end of the training period the Trainee Maths Editors will be able to transfer their expertise to undertake editing in other subject areas. Similarly, each country was invited to nominate one of its nominees to the Workshop as Counterpart Evaluator who would receive guidance from the Evaluation Consultant of the Programme and attend a three-months' training at Ibadan University under Dr. Tunde Yoloye. Liberia is the only country which had appointed both an Editor and Evaluator in the persons of Messrs. Momolu and Bettie. A letter from the Ministry of Education, Ghana, intimated that Mr. J.K. Okine, B.A., Headmaster of the Accra Academy, had been tipped for nomination as Evaluator, but the Ministry had thereafter gone no further, and there had been no response to the letter about the appointment of an Editor. Sierra Leone confirmed its intention to appoint one suitable person as Evaluator Cum Editor rather than two separate persons for the posts owing to shortage of manpower.

It was suggested that arrangements should be made for the Evaluators to spend sometime with the WAEC to acquire experience in the use of statistical material. Salaries of both Editor and Evaluator would be paid by the respective sponsoring countries. All other expenses, including costs of training outside national borders, arising from their participation in the Programme will be paid for by the Programme. There was an enquiry as to what the age limit should be for these appointments. It was pointed out that the need for Editors and Evaluators would grow rather than diminish in each country.

There would therefore be no point in selecting someone who was due to retire within a few years. It was agreed that 30 to 35 was a suitable age limit for the appointments. The Programme Editor who was located at the University College of Cape Coast would visit Sierra Leone and Liberia to work with the Counterpart/Trainee Editors who could also be required to go to the Cape Coast as a team at some suitable time agreeable to the Ministries of Education.

LOCAL COMMITTEES

It was suggested and agreed that Management Committee members should set up local committees in each country to liaise with the Maths Associations in the country and ensure that the material that was produced by the Workshop got into the schools and colleges. Also WARMP should nominate suitable participants at the current Workshop for the local committee to recommend to Ministries for appointment as Editors and Evaluators where such appointments had not already been made. The Administrator should be informed of the membership of the Local Committees and a close link should be forged between the Local Committees and the Office of the Administrator.

PLANS FOR 1971/72 WORKSHOP

The current Workshop was discussed at length. The purpose of the Workshop was stated to be a review of the material from the Entebbe Workshops in the light of present requirements of the participating countries. It was emphasized that the aim of WARMP was to produce first class texts in the modern maths, and this did not preclude the use of sources other than Entebbe. The Primary Group was to make a detailed study of the Entebbe Primary One and Two and the Teachers' Guides. It would then adapt the Primary One and Two and the Teachers' Guides adding any new material necessary to meet the requirements of the participating countries. It will also adapt the Handbook for Primary

Teachers. The Teacher-Training Group would follow a similar procedure. At the Secondary level there were three separate programmes, namely, the Entebbe, J.S.P. and S.M.P. The WARMP's concern was to provide a first class modern maths course. It would take a close look at all the existing programmes and with the Entebbe series as a basis would try and evolve a new series of Secondary texts which would meet the requirements of the participating countries. It was hoped that the Primary and Secondary Groups could complete the course for the first two years at the current Workshop and the Teacher Training Group the First Year course.

The material prepared by the current Workshop would be classroom tested by Editors and Evaluators in two classes at each level in each country. Feedback from the teachers would then be used to make final editorial decisions. Final versions of the texts would be prepared in the form of camera ready copy which would then be handed over free of charge to the Ministries of Education to print and use in their respective countries, if they wished. It was estimated that the material from the current workshop would be ready for publication by October, 1972.

Reference was made to the IDA programme in Sierra Leone which, it was said, would examine mathematics teaching in the country. It was essential to bring the IDA and WARMP together at an early stage. The meeting was assured that this had in fact been done. Prof. Awadagin Williams had supplied the IDA Project all the material that the WARMP had to give and Prof. Christian the IDA Maths specialist had already had discussions with EDC in the U.S.

The state of Mathematics teaching in Sierra Leone was discussed. There appeared to be confusion in the minds of both teachers and pupils as to what the New Maths was and the situation was aggravated by the insta-

bility of the staffs of the schools. It was not clear how much modern maths was being taught in Teacher Training Colleges in the country and it was particularly difficult to break through the autonomy of the Secondary Schools and get them to accept new things. The Mathematics Association of Sierra Leone was working to correct the present weakness, but it was proving difficult to get training college tutors to participate in the activities of the Association. The Director designate of the Institute of Education (University of Sierra Leone) Prof. Forde, who led the discussion on this topic assured the meeting of his support for the West African Regional Maths Programme and said that he would do all in his power to further the work of the Programme.

INSTITUTES AND WORKSHOPS

The meeting expressed regret that it had not been possible to hold the current workshop in Liberia because the necessary accommodation requirements could not be provided within the target dates. It was pointed out that for a writing workshop it was essential to provide a separate room for each participant.

The period January 10 to January 22, 1972 was fixed for the January Institute. It was thought among other things that there would be accommodation in Liberia then and that Liberia would be in a position to host the Institute during this period. Dr. Banks-Henries undertook to look into this. For the December Institute in Ghana the period 9th-22nd December, 1971 was fixed.

It was decided to held the next Management Committee meeting either on 15th or 16th December, 1971 in Accra, Ghana.

D. A. Brown
Programme Administrator,
Recording Secretary

MANAGEMENT COMMITTEE MEETING
of the
EAST AFRICAN REGIONAL MATHEMATICS PROGRAM (EARMP)

Location: United Kenya Club, Nairobi, Kenya

Date: July 27, 1971

People Present

Ato Bekele Getahun, Ministry of Education, Ethiopia, Chairman

Mr. Isaac Hunja, Ministry of Education, Kenya

Ato Getachew Makuria, Ministry of Education, Ethiopia

Mr. Gideon M. Kimote, Kenya Institute of Education, Kenya

Prof. W.T. Martin, Massachusetts Institute of Technology

Mr. H.P. Bradley, Director, African Mathematics Program, EDC

Prof. J.E. Phythian, University of Dar Es Salaam, Tanzania

Ato Yohannes Menkir, Haile Selassie I University, Ethiopia

Mr. John Joanou, Associate Director, African Mathematics Program, EDC

Ato Makonnen Eunatu, EARMP Program Administrator, Committee Secretary

Prof. Roy Dubisch, Maths Editor-Educator and

Mr. John Fitzgerald, Maths Educator, attended most of the meeting.

I. Selection of Chairman

Ato Bekele Getahun, declared the meeting open and asked the members to discuss the selection of the chairman.

A point of clarification was raised as who should be chairman according to the previous decision: Should the senior of the two Ministry representatives or the senior Ministry representative of

the country where the meeting is held be chairman? It was agreed that the senior Ministry representative of the country where the meeting is to be held will be the chairman. At this stage Mr. Isaac Hunja stated that he would prefer Ato Bekele Getahun to be chairman of this meeting. Ato Bekele assumed the chair.

II. Membership of Management Committee

There was a lengthy discussion on the composition of the Management Committee. It was decided that:

- (a) Membership should be on an institutional basis.

Ministries: one from each country.

Institutes of Education: one from each country. (In view of special circumstances in Ethiopia, Ato Getachew Makuria, Chief Expert will fill this slot.)

EDC: one representative and Professor Martin.

University: one representative (mathematician) from each country if there exists a person with interest and experience in the development of school mathematics education.

- (b) Membership should be on individual merits such as past experience, current activity and interest in the field of Modern Maths Education.

- (c) Membership should be based on both Institutional and individual merits.

Ato Bekele Getahun presented a letter, written to him in his capacity as chairman, by the Ethiopian Ministry of Education which stated that all EARMP correspondence should be directed to the Department

of Instruction and that the Chief Expert of Curriculum Development and Teaching Materials Production as well as the Chief Expert of Teacher Education are designated to be members of the Management Committee. This, he explained, definitely showed that his Ministry had institutionalized its Management Committee representation.

Mr. Hunja gave a similar explanation and stated that the Kenyan Ministry of Education also favours institutionalizing representation.

It was therefore resolved that the Management Committee should be composed of two from each country (one Ministry representative and one Teacher Education Specialist*), and two from EDC (one administrator and one University mathematician), and one University mathematician from each country. Other individuals may be admitted by the Management Committee because of their maths contribution or interest. It was reiterated that the Program Administrator is the Recording Secretary of the Committee and will prepare a record of the minutes of the committee meetings.

It was stated that Mr. Walakira from Uganda has recently shown an interest in the Program and the committee speculated whether the Ugandan Ministry of Education may be interested as well. The Committee asked the chairman and Mr. Bradley to explore and report on this.

It was pointed out that Dr. Paul E. Mugambi of Makerere University and former member of the African Mathematics Program Steering Committee has now returned to Uganda. If Uganda should join the program, Dr. Mugambi would be a very useful addition to the committee.

* In Ethiopia the Head of Teacher Education in the Ministry of Education will be the representative.

III.

Report on Activities

(a) Mr. John Fitzgerald submitted a summary of his four reports (two for Kenya and two for Ethiopia). It was noted that some tutors in Ethiopia and some supervisors in Kenya are not participating fully in the correspondence course. It was felt that greater attention must be given to offering the Ethiopian lecturers work at their level of ability. Some form of specialization is planned for the Kenyan supervisors so that not all supervisors will need the full math courses being offered.

The Committee expressed its desire that a greater degree of guidance in their own teaching practices should be given to the college tutors so that in some way the methods of teaching within the colleges are related to the activity methods which are being recommended for the schools.

(b) Mr. Fitzgerald reported on the performance of correspondence courses as satisfactory in spite of the fact that supervisors are normally very busy in their routine work. Extent of participation in the correspondence courses is listed below.

<u>ETHIOPIA</u> Total 67 participants	Number of participants at Jan., 1971 Addis Institute:	Correspondence Course response
	55 Supervisors	50% - 60%
	12 Lecturers	*
<u>KENYA</u> Total 41 participants	Number of participants at Dec., 1970 Nairobi Institute	Correspondence Course response
	24 Supervisors	50%
	17 Tutors	75%

* The Ethiopian lecturers are overqualified for the existing course. A revised correspondence course in accord with their level is being prepared.

Some drop-outs were reported. The Committee resolved that they may be replaced on the recommendation of the Ministries.

There was some discussion on the need to offer some incentive to tutors and supervisors who are participating in the Program. The Ministry representatives were requested to pursue this matter with their Ministries.

- (c) The present workshop participants shall definitely be Trainee Evaluators and Editors in the case of Kenya but not necessarily so with the Ethiopian participants. The Trainee Evaluator nominated by the Ethiopian Ministry of Education, Ato Girma Mengistu, was unable to attend the workshop.

The committee expected a report of the performance of the workshop participants from the workshop leaders.

- (d) & (e) The appointments of the Consultant Evaluator, Dr. Bernard J. Shapiro and of the Maths Editor-Educator, Prof. Roy Dubisch, were endorsed.

IV. Legal Status

Association with the East African Council of Education was unacceptable to the two Ministries since the Council was an association of universities and not of governments as EARMP is. Such association was therefore ruled out and the Administrator was instructed to inform the Council's secretary of this decision.

In the meantime both Ministries' representatives, Messrs. Getahun and Hunja, have taken the responsibility to approach their respective

Ministries to investigate the problems of obtaining legal status for the Management Committee as it is presently constituted.

Prof. Martin, Mr. Bradley and Mr. Joanou were asked to inform U.S.A.I.D. of the effort and problems encountered and to find out the kind of legal status required.

V. Plans for 1971/72

The Trainee Editors and Evaluators shall begin their training at the workshop. It was generally agreed upon that eventually Trainee Editors and Evaluators should be capable of editing and evaluating in other subjects as may be required by the Ministries.

The Teacher Training College Text prepared at the 1971 Workshop shall be produced in Gestetner form under the supervision of Prof. Dubisch and be given classroom trials during this period. Mr. Hunja was requested to obtain official approval for such trials in Kenya.

There shall be two Institutes, one in Ethiopia and another in Kenya. Institute tentative dates shall be December 6 to 18, 1971 in Kenya and January 3 to 18, 1972 in Ethiopia. Correspondence course activity will continue.

VI. Proposals for 1972/73

If necessary, EDC will prepare a new proposal; a draft will be distributed to Committee members for their approval. The Committee called for the development of a new budget taking into consideration the possible expansion of activities, e.g. the semester course for Trainee of Evaluators at Ibadan and the experiential visit of

the Trainee Editors in the United States. It was projected, however, that one Workshop and two Institutes shall be run. It was noted that the per diem rate for participants at the 1971 Addis Institute was insufficient. A suggestion was made to increase this item in the forthcoming budget. The number of participants shall be decided on the basis of availability of personnel and funds. It was recommended, however, the number of participants of each Institute should be 50 with a few more if requested by the Ministries and money and space is available. Correspondence courses will continue. Training of Trainee Editors and Evaluators will continue.

The tentative date for the publication of Volume 1 of the Teacher Training College text was put as October 1972. At such time camera ready copy will be presented to the Ministries. Trainee Editors will pay an experiential visit to the U.S. around September - November of 1973 and will take a one-semester course at the University of Ibadan, September 1972 - January 1973

Details of these proposals will be given further consideration at the December Meeting.

VII.

Subsidiary Mathematics

The Committee reaffirmed the need for Subsidiary Mathematics as expressed by both Ministries' representatives and by Prof. Phythian. A two - day meeting of University Mathematicians and Secondary School Maths teachers was called for under the leadership of Prof. Phythian. The tentative date of the meeting shall be Sept. 28, 1971.*
venue shall be the United Kenya Club, Nairobi.

*This date subsequently changed to September 20- 21, 1971

VIII. Relationship of Administrator to Maths Educators and Editor

It was pointed out that, at this stage of the program's development, the Mathematics Educators and Editor and the Administrator are employees of EDC and work under EDC direction. Mr. Bradley, Mr. Joanou and Professor Martin were requested to define the relationship between the Administrator and the Educators and Editor.

- IX. The Chairman informed the meeting of the resignation of Mr. Hugh P. Bradley from EDC. Mr. John Joanou was appointed to take his place as EDC representative on the committee.

Vote of Thanks

- X. The committee passed a unanimous vote of thanks for the long and invaluable contribution to African Maths in favor of Mr. Hugh P. Bradley and EDC. The committee wished Mr. Bradley success in his future work. A note of thanks was extended to Ato Makonnen Eunatu for his performance as Program Administrator, his cooperation with the Ethiopian and Kenyan Ministries of Education and his successful planning of the Winter Institutes and the Nairobi Summer Workshop.

Next Meeting

- XI. The next Management Committee meeting shall take place in Addis Ababa on December 20, 1971.

Makonnen Eunatu
Program Administrator,
Recording Secretary

August 1971

MODE OF OPERATION

Management Committee
of the

East African Regional Mathematics Program (EARMP) and
West African Regional Mathematics Program (WARMP)

Composition of the Committees

It was decided that four areas of competence and responsibility should be represented on the committees:

- 1) Ministries of Education (one from each country)
- 2) Institutes or Faculties of Education (one from each country)*
- 3) Mathematicians (African university and U.S.A. university people with AMP experience)
- 4) Administrative experience (one EDC representative)

The Management Committee may increase the membership of the committee if it seems desirable.

The Role of Education Development Center and the Management Committee

During an interim period estimated to be eighteen months to two years, EDC will hold general responsibility for the program, professionally, educationally and financially.

In carrying out this responsibility EDC will be advised and guided by the Management Committee. Staff appointed to work in the participating countries must be approved by the Management Committee. During the

* Due to special circumstances in Ethiopia, the representative in this category will be the Chief Expert of Teacher Education.

interim period the Committee will advise EDC in the preparation of proposals for the continuing funding of the program. Program policy will be approved by the Committee. The local administrator will implement policy.

The purpose of this interim period is to provide the local administrator with EDC's experience in administering a curriculum reform program, placing heavy emphasis on:

- 1) proper fiscal management
- 2) planning and operating teacher training institutes and workshops
- 3) preparing proposals and budgets for ongoing activities

As soon as satisfactory arrangements for transfer can be made, full control of the fiscal, administrative and educational responsibilities of the program will pass on to the Management Committee (or similar body organized for assuming fiscal control) acting through the local administrator who will then become its officer.

The committee members from the Ministries and Institutes of Education will hold their membership as representatives of their Ministry of Institute and not in their own right. Thus they will be considered as official spokesmen at the meetings. It may be expected that in such a situation decisions of the Management Committee may require further official approval from the Ministries or the Institutes. In such a case these official committee members will be expected to present the views of the Management Committee to their Ministry or Institutes and strive to obtain the necessary approval from those who finally decide. In other words, these official members of the Management Committee are the local representatives of of the program while also representing their Ministry or Institutes on the Management Committee.

The Local Administrator

The local administrator will be an employee of EDC during the interim period but his appointment must have the Management Committee approval. He will report to EDC and to the Management Committee keeping both organizations informed of the program's progress and activities. He will arrange for the implementation of program decisions and be responsible for the day to day administration of the program. At the end of the interim period the local administrator will be directly responsible to the organization which finally assumes responsibility for the program.

Meetings of the Management Committee

The Management Committee will normally meet twice a year but will meet more often if the need should arise. A chairman will be chosen, his term continuing until the next meeting. Initially EDC and the local administrator, and later the local administrator, will maintain close contact with the chairman who will be responsible for calling the normal- or unscheduled meetings.

Chairman of the Management Committee

At the first meeting of the Management Committee it was decided that the chairman at any one of its meetings will be the senior official representative attending for the country in which the meeting is held.

Veto

The official Ministry representative of a participating country has the power of veto over any activities planned for that country.

Relationship between Local Administrator and the
Mathematics Educators and Editor and EDC

During the interim period the Administrator, Educators and Editor are employees of EDC and work under the Program Director. The Administrator's task is to provide administrative services to the Educators and Editor and to maintain liason with the Ministry of Education, the Management Committee members and EDC. He will act as secretary of the Management Committee and prepare minutes of its meetings. He will ensure adequate planning for visits of the Educators and Editor to colleges, will set up workshops and institutes and administer these activities. He will report regularly to EDC on program activities. Normally, except where need or commonsense indicates otherwise, the Educators and Editor will report on these activities to the Administrator and should obtain from him necessary administrative support. Their own administrative efforts should be kept at a minimum. EDC will guide their professional efforts.

During the interim period the Administrator will be given guidance in all parts of his work by EDC with the hope and expectation that at the end of this period the Administrator can assume full responsibility for the program (under the Management Committee) and will be capable of assuming independently, full administrative and professional control. At this stage the Educators and Editor will work directly under the Administrator and will be responsible to the Management Committee through the Administrator.

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

EVALUATION PLAN

Prepared By

Dr. Bernard J. Shapiro

ENTEBBE - CONTROL COMPARISON

(i) Situation

There appear to be few if any classes in this area that are using the original Entebbe materials. In Ghana, an adaptation of these materials has been adopted; in Liberia, most schools are using a number of different texts thus making a description of the program somewhat tenuous, and in Sierra Leone, no classes appear to be available either. Thus, it appears to be too late to make this particular comparison in this area. In addition, the WARMP participants were very negative about the conception to begin with. They felt that since the program was about to disappear, the comparison would be useless. In addition, they pointed out that control classes would themselves not be true controls since one of the responses to the Entebbe program had been to adopt some modern mathematics series although not necessarily Entebbe. Thus, few 'traditional' classes would be available.

(ii) Strategy

Since there are virtually no 'experimental' classes available (and those few which might be found would be virtually impossible to match with controls), and since this comparative study seems uninteresting to all concerned, the idea will be abandoned for the WARMP.

However, in order to provide some useful data for the 1972 Summer Workshop, both Jack Norris and Jack Alexander have agreed to attempt to locate some Primary Three Entebbe classes. The Entebbe Primary Three test materials could then be administered and the resulting data used for the information of those who will revise this program next summer.

(iii) Notes

There are a number of other reasons for abandoning the Entebbe - Control comparison. These can perhaps be marshalled if it is necessary to defend the decision in Washington, whose idea the comparison was.

Copies of the Primary Three test materials were left with Roger Hartman so that should the classes be located, materials could be prepared and distributed.

II. SUMMER WORKSHOP MATERIALS

(i) Situation

The 1971 summer workshop was devoted to the preparation of a) a teacher training text, b) revised Primary One and Primary Two materials, and c) revised Secondary One and Secondary Two materials.

(ii) Strategy

In each country, each of the prepared materials will be tested in two locations with some attempt being made to test the materials with teachers who have had Entebbe experience as well as with those who have not. Evaluation of these preliminary versions will be centered entirely on teacher response to the materials which will be elicited by response to a chapter-by-chapter questionnaires to be prepared by Roger Hartman.

In addition, process notes will be kept of all visits to and observations of the test-trial classrooms.

(iii) Notes

Preliminary work on the questionnaires was completed in conjunction with Roger Hartman.

III. INSTITUTE PROGRAM

(i) Situation

The preliminary plans for this program were as outlined in my letter to Hugh Bradley on October 17, 1970. In discussing these plans with the WARMF staff, it appeared that:

- 1) the pretests had been administered
- 2) the attitude questionnaires had been abandoned
- 3) the 'case' problems in classroom mathematics had been primarily concentrated in the correspondence materials
- 4) some classroom observations had been done
- 5) records were being kept of the correspondence courses

There was some feeling that the correspondence materials were not themselves adequate, and the Math Educators were revising the second set and thinking of writing an additional 'individualized' set for the final phase of the program. There was also some concern over the difference between the Ghanaian participants and those from Liberia and

Sierra Leone.

(ii) Strategy

a) Mathematics Tests

As planned the posttest will be given at the second institute to all of those who completed the pretest. Analyses of the data will focus on general shifts in achievement level and detailed item analyses.

b) Correspondence Course

The Mathematics Educators will continue to keep detailed records of the tutors' performance on these materials. Records will include achievement ratings on each of the assignments, number of assignments completed, time taken to complete, professional background of the participant, reasons for lack of completion or leaving the program, particular responses to 'case' situations, etc. Content analyses of these materials will be done and related to the results of the pretest - posttest comparison.

c) Participants' Teaching Practice

From the correspondence materials, responses as to the participants' self-reports about hypothetical classroom situations will be reviewed. Further, both Math Educators will keep detailed records of their observations in each of the classrooms. The Mathematics Educators will submit to me a number of possible standard observation scales which they have found useful. One will be selected and used repeatedly in a time-series set of observations on a sub-sample of the participants' classrooms. Some attempt will be made to visit control classes, but the Educators feel that the press of time may make this impractical and EDC felt that the Trainee Evaluators could not be pressed into service for this particular task.

IV. TRAINEE EVALUATORS

(i) Situation

Each country was to have appointed a trainee evaluator to work on this program. Mr. N. Bettie has been appointed by Liberia, but neither of the other countries has yet made a nomination. This difficulty in addition to the lack of clarity as to the time commitment of the appointees have led to strategies as outlined above which are minimally dependent on the trainees.

(ii) Strategy

I have asked Mr. Bettie to complete the following assignments:

- 1) Find three or four classes at the Primary Three level who are using the Entebbe materials. We can then administer the Primary Three test materials as per Section I above.
- 2) Ascertain more certainly whether or not control classes for the above groups could be located in Liberia. If so, there remain some logistical possibility for the Entebbe - Control comparison.
- 3) Write a report indicating the discrepancies (if any) between the official Liberian syllabus and the Entebbe program, and recommend what changes should be made in either in order to bring them closer together.
- 4) Keep a list of the participants in the Liberian Institute program, their positions, reasons for entering and leaving the program, etc. In addition, prepare a questionnaire concerning their reaction to the program their likes, dislikes, etc., etc., all of which information should be a valuable supplement to the data being collected by the Math Educators.
- 5) Keep in touch with the classes where the Workshop materials are being tested in order to insure that they respond to the questionnaires etc., etc.

In addition, I have insured him that I will keep in touch to provide some reprints, experimental observation scales, etc., etc.

A CLOSING NOTE

It should be understood that the preliminary plans outlined in this report are not meant to be ideal models. Rather, they are meant to be useable models; that is, they are directed to the collection of useful information that is in fact attainable given the restrictions under which the program is operating in terms of human and financial resources.

Some further clarity on the identity and the responsibilities of the Trainee Evaluators would be a great step forward in developing these plans at a more adequate level.

Should these general plans be found acceptable, I will be in contact with the relevant participants immediately in order to begin implementation. The complete working out of some of the plans and then the beginning of the data analysis would be the purpose of a possible trip to the second series of Institutes.

October 20, 1971

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM

EVALUATION PLAN

Prepared By

Dr. Bernard J. Shapiro

I. ENTEBBE - CONTROL COMPARISON

(i) Situation

In Ethiopia, there are no schools presently using the original Entebbe materials. In Kenya, however, there are twenty-six schools in the metropolitan Nairobi area that have been consistently using the Entebbe series.

(ii) Strategy

(a) 1971

The trainee evaluator for Kenya, Mr. Gideon Kimote, will select twenty-six control schools to approximately match the twenty-six experimental schools using the Entebbe materials. All of the control schools will have in common the same traditional mathematics program. The initial plan had been to make the comparison at either the Primary Three or the Primary Four level. However, these plans were abandoned because:

- 1) the Ministry prefers not to test in the primary levels One through Three and,
- 2) there appeared to be no available human resources for instrument construction at the Primary Four level within the coming months.

Therefore, the comparison will be made at the Primary Seven level where, in November of this year, the KIE will administer a mathematics paper

to all Kenyan Primary VII classes. Our task will be simply to do the general comparisons and detailed item analyses for the experimental and control samples.

(b) 1972

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 schools will be selected. The testing will take place in November, 1972.

(iii) Notes

A formal request should be made to the Kenyan Ministry for release of the test data when it becomes available. At a visit to the Inspectorate, this problem was discussed, and verbal assurances were given.

The EARMP staff was not excited by this project; they felt there was little point in evaluating a program about to be phased out. However, the Ministry seems to be looking forward to the data.

II. SUMMER WORKSHOP MATERIALS

(i) Situation

The 1971 summer workshop was devoted to the preparation of a teacher-training text based on the original Entebbe materials.

(ii) Strategy

(a) General Coverage

Initially, there will be an internal evaluation in that both Professors John Green and Shirley Hill will review the summer material and comment on it. This approach is internal in two senses: it is primarily developmental in purpose, and the evaluators are also centrally involved in the material preparation.

Following this preliminary review, a copy of the text will be sent to all of the tutors in the training colleges along with a request for a written response to the material.

(b) Specific Coverage

Two teacher training colleges in each country will be selected for detailed trials of the teacher training text. The tutors involved at these institutions will respond to a questionnaire focusing on the materials as they complete each chapter. Additional data will be available from the Math Educator's visits to these tutors and their classrooms. Both Dr. Dubisch and Mr. Fitzgerald have agreed to keep detailed notes of these

visitations.

In addition to the above, an attempt will be made to assess the value of the materials in terms of learning outcome. In November 1972, the KIE will administer a Mathematics Paper in all of the teacher training colleges. Our plan is to select control colleges to those testing the teacher training text and then to compare the relative performance of the students on the mathematics paper. The KIE papers in education and Swahili will be used as control variables to ascertain the comparability of the comparison groups.

(iii) Notes

A formal request should be sent to the Ministry to obtain written permission to use the data from the November 1972 testing in the teacher training colleges.

Since the summer workshop materials will relate to the first year P3 program at the teacher training colleges, there will probably be only one 'test-trial' tutor at each of the teacher training institutions.

The questionnaire for the 'test trial' teachers was completed during my stay in Nairobi, and Mr. Eunatu was to take the responsibility for reproducing it and making sure it was sent out to the appropriate respondents.

III. INSTITUTE PROGRAM

(i) Situation

Initial plans for the evaluation of this program had been outlined by me in the Fall of 1970 before the onset of the first Institute, and this outline is given in my letter to Hugh Bradley dated October, 17, 1970. These plans envisioned:

- 1) mathematics tests to be administered at each of the two institutes
- 2) 'case' problems in classroom mathematics
- 3) attitude questionnaires
- 4) classroom observations, and
- 5) content analysis of the correspondence course work.

In discussing the implementation of these plans with the EARMP staff, it appeared that:

- 1) the attitude questionnaires and 'case' problems in mathematics had been abandoned
- 2) the mathematics pretest had been administered to most of the Kenyan participants but not to the Ethiopians who felt that as mathematics graduates, it was beneath them

- 3) classroom observations and visits were being made but not in any standard or formalized way, and
- 4) records were being kept of the correspondence course results.

(ii) Strategy

a) Mathematics Tests

As planned the posttest will be given at the second institute to all of those who completed the pretest. This will be limited essentially to the Kenyan group, but the appropriate comparison will be made for this sample.

b) Correspondence Course

The Mathematics Educators will continue to keep detailed records of the tutors' performance on the correspondence materials. Records will include achievement ratings on each of the assignments, number of assignments completed, time taken to complete, professional background of the participant, reasons for lack of completion or leaving the program, etc. Content analyses of these materials will be done and related to the results of the pretest - posttest comparison.

c) Participants' Teaching Practice

No attempt will be made to ask participants to describe their real or hypothetical behavior in the classroom, for the EARMP staff felt that the participants would be aware of the 'desired' behavior and describe that rather than their own practice. Therefore, teaching practice will be assessed by a descriptive practice written by the Math Educators for each of the actual math classes that they visit. An attempt will be made to select a small sub-sample for whom a time-series observation can be made.

iii) Notes

The Math Educators felt that the mathematics test results might be misleading since many of the participants were not 'maths' people, and, therefore, they had little motivation to do well.

The Math Educators felt that classroom observation would not be possible on all visits to the training colleges. These visits do not always coincide with math classes, sometimes conflict with student teaching, etc. However, they will attempt to keep as complete records as possible and will make some effort to observe the supervisor participants in in-service training situations.

IV. TRAINEE EVALUATORS

(i) Situation

Each country was to have appointed a trainee evaluator to work on this program. Kenya has appointed Mr. Gideon Kimote who was at the Workshop. The Ethiopian appointee was not at the Workshop, and Mr. Eunatu feels that he may not take up the post. Given the possibility that the job may then revolve upon one of the Ethiopians at the Workshop, I discussed all of the proposed plans with them as well.

(ii) Strategy

a) Curriculum Evaluation Course

It is assumed that all trainee evaluators will journey to Ibadan to take this course. I understand that it will be given in the 1972-73 academic year; in any case, the participants will need some definite information in the near future.

b) Teacher Training Materials

For the moment, the Trainee Evaluators will not be involved in the testing of the teacher training materials. The Math Educators and Editors will review the questionnaire materials and do the actual classroom observations. The EDC staff had felt it would be better to avoid the trainees as tutor-observers for the first year, and in addition, there would be the problem of travel expense were this strategy to be considered.

c) Institute Program

Here again, the Trainee Evaluator has no specific responsibilities. However, plans were made for some training to occur. I have agreed to send the trainees sample observation scales for their experimentation in a variety of classroom situations. Once some experience has been gained, we will go on to more complex scales and problems in interjudge reliability.

d) Entebbe-Control Comparison

Here the work is limited to the Kenyan evaluator. His responsibility is to select the 26 control classes for the November, 1971 testing, assist in the data analysis that follows, select the control classes for the November, 1972 Primary Four testing and construct the test instrument for this latter administration. The tentative target date for the completion of this instrument is June 1972.

e) New Adapted Materials

Both Kenya and Ethiopia are now involved in preparing new adaptations of the original Entebbe materials. The new program was introduced into the Primary One in Kenya in January of 1971 and in Ethiopia in September of 1971. An additional level will be added in each successive school year. This effort is, of course, outside the EARMP program, but it is the area in which the Ministries are most concerned with evaluation. It might be possible to assist them in this respect by using the substance of the adapted programs as content for the education of the Trainee Evaluators. It would provide good additional experience in instrument construction.

In any case, this lies somewhere in the future, for after considerable discussion with the EARMP participants and the Ministry and KIE people, it was felt that for a number of reasons (human resources and the difficulties of group testing with young children among them), evaluation efforts in this program would begin no earlier than 1974 when the adapted materials will be first introduced at the Primary IV level.

Report of Subsidiary Mathematics Conference

by

Professor J. E. Phythian

Mathematics Subsidiary Conference 16th September 1971

Venue: New Education Building, University of Nairobi Room 102

Present:

Mr. E. Maddu-Kizza (University of Nairobi)
Dr. P. Mugambi (Makerere University)
Mr. D. Morris (Kenya Institute of Education)
Mr. J. Green (Lenana School - Nairobi)
Professor J.E. Phythian (University of Dar es Salaam)
(Chairman)

Report

Introduction

The chairman welcomed the members and regretted the absence of the Ethiopian delegate Mr. C. Gee (Haile Sellasie University, Addis Ababa). The meeting decided that as this was a preliminary meeting it could go on provided Ethiopia were fully informed of the proceedings.

The meeting began with a thorough review of the FIVE basic papers on Mathematics for

- (i) Economics, (ii) Biology, (iii) Physics, (iv) Algorithms and Computers
- (v) Geograph and Geology.

Since not all delegates had read these the chairman (who had) lead the members through each paper. It was realised that the papers were of radically different styles and some were rather too high flown for East Africa today. Many topics were noted as suitable for subsidiary course in East Africa.

A second set of documents brought to the attention of the meeting was the current Subsidiary Mathematics (Modern) syllabus for East Africa produced in February 1971 by An International Mathematics Panel of the East African Examination Council. Additional Mathematics and A-level Mathematics syllabuses (modern) were also available.

The meeting spent much of the morning extending this syllabus to include what was thought (by the delegates) to be relevant from the FIVE papers together with other topics which the committee felt were valuable at this level. The extended syllabus is produced as Appendix 1 of this report.

Chapter Headings

After lunch this body of mathematics was placed in flow diagram boxes with each box roughly equivalent to a chapter. The flow diagram of Appendix II was created by this means and finally the chapters and arrangement of a book on "Subsidiary Modern Mathematics for Eastern Africa" was produced with twenty chapters or thereabouts. It was felt that the material of this book could be taught to post-O-level (Modern) students in six hours per week for a little less than TWO years.

However no teacher would do exactly this but he would select between 60 and 75% of the material for his course of 4 hours/week depending on the current syllabus, for subsidiary, in use. It was felt that the material proposed in Appendix 1 should be relevant for upto 10 years in East Africa.

The urgent need for the book, demanded that very rough plans for co-operation in writing the book should be formulated. Accordingly chapters were designated as in Appendix 3 and in view of the likely 400 pages in length, it was felt that two volumes would be needed (-one for each year - to reduce wear)

In order to speed up the writing process these twenty chapters were divided into FOUR chunks - one chunk per country. Each chunk being about 5 chapters-roughly half of which were immediately needed and half of which would be needed after ONE year in the second volume. These chunks with possible countries are shown in Appendix 4, together with names of country-wide coordinators and possible authors - the latter should not be taken seriously at this stage. The meeting considered at some length the possibility of using chapters of presently existing text but decided that this was in any case being done in a manner similar to Appendix 6 for example, and that it was not very satisfactory in view of the requirement of an ancillary subject book which required

- 1) examples relevant to East Africa
- 2) example motivation for the work.

It was agreed to request Ethiopian opinion also on this matter. An approximate time scale for the operation is shown in Appendix 5, it being recognised that attention to the early dead lines is very important if the work is to progress. Appendix 5 shows a possible time scale for the work - this will be subject to the overall administration going smoothly.

Administration

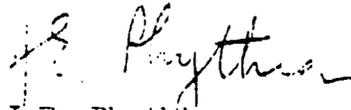
From appendix 5 showing the time scale there is need to set up a meeting to finalise the details of chapters and their relationship to each other before beginning the work of writing: this was felt to be more appropriate than taking out chapters of books in existence and trying to fit these together.

There seems to be an immediate need for about 2-3000 copies of the book for Eastern Africa - although this also depends on Ethiopian requirements. In view of the long term nature of the book it is likely that more copies will be sold as the schools move to this new syllabus. Because of a likely "commercial" price for this book (in 2 volumes) of about 55/= it was felt that an exploratory survey of possible sources of support for the book should be sought which would bring the price down to about half that figure i.e. about 30,000/= support is needed.

On the possibility of payment to authors there was some division of opinion although several Delegates felt that this was the only way of writing the book. In view of the need for the book this was felt to be an important issue but not resolvable at the meeting. Support would also be needed for the main co-ordination meeting. Professor Phythian suggested that books printed in Addis Ababa were often significantly cheaper than those from other possible sources.

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19th September 1971


J.E. Phythian
CHAIRMAN



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FEDERAL ETHIOPIAN GOVERNMENT
MINISTRY OF EDUCATION & FINE ARTS

ቁጥር ፡

አደራ ፡ አባባ ፡ 1972 ዓ.ም ፡

no. 3/4-697/3358/66
9-10-71

✓ Mr. John Joanou
African Mathematics Program
Education Development Center
55 Chapel Street
Newton, Mass. 02160 U.S.A.

Dear Sir:

Ato Bekele Getahun, Assistant Minister of Scholarship and Foreign Assistance and Chairman of the Management Committee of the East African Regional Mathematics Programme has requested assurance from this Ministry that once camera ready copy of the manuscript of "Fundamental Concepts of Mathematics", Volume I is available (approximately October, 1972) it will be printed and distributed to prospective primary school teachers in the training colleges.

I hereby wish to assure you that we are prepared to print and distribute this text as we have done in the past with both primary and secondary Entebbe texts.



Yours truly,

Bekele Gayid
Bekele Gayid
Vice-Minister

cc/ Administrative Service Dept.
Teacher Education Division
External Aid Dept.



Telephone: Nairobi 28411 Ext. 2136

When replying please quote

Ref. No. INS/N/1/16/165.
and date

MINISTRY OF EDUCATION
INSPECTORATE

P.O. Box 30426, NAIROBI

26th October, 1971.

Mr. John Johnson,
African Mathematics Program,
55 Chapel Street,
Newton,
Massachusetts 02160 U.S.A.

NOV 3 REC'D

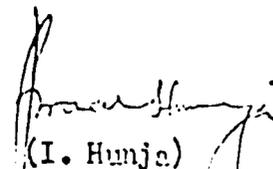
Dear *John* ,

EAST AFRICAN REGIONAL MATHEMATICS PROGRAM
TEXTS PRODUCED BY 1971 SUMMER WORKSHOP

Thank you for your letter of 13th October, 1971. I am glad that you put your case clearly and I realise the necessity for your need for a letter from the Ministry of Education about the texts written by the 1971 Summer Workshop.

As I stated at the beginning of the Workshop the Kenya Ministry of Education intends to use these publications when they become available in its Teachers Colleges. I also made it clear that the decision to use these books will depend on the Chief Inspector of Schools' final decision as to whether they are properly suited for the colleges.

Much as I would like to say that the book will be used, I am sure that the Chief Inspector of Schools will insist on being fully satisfied that these are the best books to recommend. In this connection I am waiting for the camera ready copy to forward to the Chief Inspector of Schools so that his final approval may be obtained. The sooner this is done the better and I am sure A.I.D. should receive a satisfactory reply so that the decision to fund the E.A.R.M.P. can be made.


(I. Humja)

for CHIEF INSPECTOR OF SCHOOLS

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>
Messrs. Tucker, Manu, Kamara Misses Cummings, Tumaku, Taylor Mrs. Macauley, Kombe-Kajue	Freetown	February 1 - 12 ..
Mr. Ndanema		
Messrs. Harding & Bockarie		17 - 19
Base	Njala	22 - 28
Mr. Gbondo	Njala	March 1, 2
Messrs. Turner & Aruna	Koidu	3, 5
Mr. Komeh-Navo	Kenema	8, 9
Messrs. Caulker & Massaquoi	Yengema	10 - 12
Messrs. Spaine-Young, Kamara, Koroma & Dugba	Makeni	15 - 19
Mr. Kanu	Lunsar	22, 23
Base	Njala	23 - 28
Ngebeh	Lungi	29, 30
<u>To Monrovia</u>		30
Messrs. Elliott, Dennis, Sherman, Maximore, Flahn, Bertie, Carr, Kimber, Paasewe Misses Thompson & Yanay	Monrovia	31 - April 17
Mr. Johnson	Lofa County	April 19, 20
Mr. Snoh	Kakata Training College	21, 22
Mr. Cleon	Harbel	23, 24
Mr. Diggs-Robertsport		26, 27
Arrive Ghana (Accra)		28
Messra. Ameyaw, Oduro & Ampofo	Adukrom Training College	30 - May 4
<u>Move to Cape Coast</u>		5

Messrs. Badu-Prah & Arthur	Continue to Takomdi	May 6 - 8
Mr. Augustus Oguah	St. Mary's	10, 11
Mr. Quansah & Sister McDonald		12 - 14
<u>Return to Cape Coast</u>		
Messrs. Asare Afful, Kofie, Amoh, & Kumi	Foso	17 - 22
Mr. Micah & Mrs. Afful		24 - 26
Cape Coast		27 - June 2
Mr. T. V. Yarbey	Nyarkrom	June 3, 4
Messrs. Adjei, Ampah & Martinson		7 - 11
Messrs. Abbiw & Sagoe		14 - 16
<u>Return to Njala</u>		June 19

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>
Augustus Alobuia E.K. Kattah P.A. Dzila	Dzodze-Penyi Training College P.O. Box 45, Dzodze	February 1, 2
S.D. Mortagbe A.K. Wemegah E.K. Gamedoagbao	Akatsi Training College P.O. Box 21, Akatsi	3, 4, 5
K.K. Alordzi-Sosa D.C. Bluku	Anlo Training College P.O. Box 26, Anloga	8, 9, 10
S.O. Akwa (Left teaching)	Ada Training College	11, 12
E.N.Y. Annan L.N.A. Kotei E. Frempong D.T. Mensah Mrs. A.A. Seini	Accra Training College P.O. Box 5273, Accra-North	15, 16, 17, 18
M.N. Damenor F.K. Ayensu A.G. Shardow	Methodist Training College P.O. Box 35, Aburi	19-22, 23
S.A.B. Nkrumah Victor Gyan-Mante C.N. Kissiedu	Presbyterian Women's Training College, P.O. Box 19, Aburi	March 3, 4, 5
J.O. Ameyaw J.K. Oduro H.O. Ampofo	Adukrom Training College P.O. Box 27, Adukrom	8, 9, 10
D.N. Odoom M.A. Twumasi S.G. Boateng	Presbyterian Training College	11, 12-13
M.M. Osei E.A. Agyare	Anum Training College P.O. Box 19, Anum	16, 17
A.W. Doe W.K. Agbo	Peki Training College, Peki	18, 19
J.K. Ennin H.A.K. Jamboe O.K.F. Geraldo de-Zima	St. Theresa's Training College P.O. Box 129, Hohoe	22, 23, 24, 25, 26

<u>Name</u>		
C.M. Ademadziku E.B.K. Atitsogbi E.K. Wortordzor-Domi	St. Francis Training College P.O. Box 100, Hohoe	March 22, 23, 24, 25, 26
Miss Offei-Awuku	Women's Training College Odumase-Krobo	
M.E.K. Mensah E.D. Dor	S.D.A. Training College P.O. Box 18, Asokore-Kofodua	April 26, 27, 28
D.K. Djang	Tafo Training College Tafo-Akim	29, 30
J.N. Antwi	E.P. Training College Amedzofe	May 3, 4
N.W. Kpo P. Akabaa	Anfoega Training College Anfoega	5, 6, 7
C.W.K. Asare E.K. Asante P.C. Daamtsoe	Jasikan Training College P.O. Box 14, Jasikan	10, 11, 12, 13, 14
J.M. Takpoi	Bueman Sec. Sch. Jasikan	
M. Dzata D.M.K. Yaadar M.L. Lomotey	Mt. Mary Training College P.O. Box 19, Somanya	17, 18, 19
M.C. Gaisie	Begoro Women's Training College Begoro-Akim	20, 21
G.K. Ansanyi B.K. Addo E.D. Ampong	Abetifi Training College P.O. Box 19, Abetifi	June 2, 3, 4-7
Jacob Oteng G.D. Obuobi	Nkwatia Training College P.O. Box 22 Nkwatia Kwahu	8, 9, 10
T.A. Ayeh G.L. Appiah	Obo Training College Obo-Kwahu	11-14, 15
Paul Dame	Juaben Training College P.O. Box 10, Juaben-Ashanti	16, 17, 18
Victor Yanney	Kibi Men's Training College Kibi Akim	21, 22

East African Regional Mathematics Program

First Visiting Time Table

of

J. C. FITZGERALD

Kenya

February 1 - 6	<u>Western Province</u> - P.E.O., then KAIMOSI, EREGI and BUTERE in that order.
8 - 13	<u>Nyanza Province</u> - P.E.O., then SIRIBA, KISII and ASUMBI in that order.
15 - 20	<u>Central Province</u> - P.E.O., then KAGUMO, KAMWENJE, MATHARA in that order.
22 - 27	<u>Rift Valley Province</u> - P.E.O., then KERICHIO, MOSORIOT, KITALE in that order.
March 1 - 6	<u>Eastern Province</u> - P.E.O., then EGOGI, MERU, KIGARI in that order.
8 - 13	<u>Eastern Province</u> - P.E.O., MACHAKOS, KITETA, MUTUNE and MBOONI in that order.

Ethiopia

March 22 - April 22 (approximately) JIMMA, HARAR, ADDIS ABABA, DEBRE BERHAN, ASMARA

Calls also made at:
DIRE-DAWA, MAKALE, GONDAR

Discussions held in:
KAFFA, HARARGHE, SHOA, ERITREA, TIGRE, BEGEMDIR

Kenya

May 3 - 7	SHANZU, HIGHRIDGE
10 - 14	KERICHIO, ASUMBI, KISII, SIRIBA, CHADWICK
17 - 20	EREGI, KAIMOSI, MOSORIOT, KITALE

May	31	MACHAKOS (possible MBONI
June	1 - 3	KITETA, KITUI, KILAMAMBOGO
June	7 - 8	THOGOTO, KIAMBU

Ethiopia

June	14 - July 11	LEKEMPT, GORE, ASELLA, GOBA, YIRGALEM, ARBA MINSCH, DEBRA MARCOS, DESSIE, ADDIS ABABA
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Reports on Visits to Sierra Leone Participants
by John W. Alexander Maths Educator
February 1 - March 30, 1971

Generally speaking I kept to the schedule pretty well. There were a few deviations and a few people were not at the station when I came to visit. Below is a short description of what occurred at each place I visited:

February 1

I visited Mr. Noah. He gave me directions to Howe Street where Miss Kombe and Miss Tumaku are teaching. I visited both of them that morning. Miss Kombe was on her break so I was able to talk with her about the correspondence course. I also had the opportunity to watch Miss Tumaku do a Math lesson. We talked later about some question she had about Geometry. Both teachers complained that they did not have the books (Basic Concepts I & II). I had some trouble locating Miss Cummings at first. She had changed schools so I did not see her on the first of February. I did visit Mr. Manu and Miss Taylor.

I was able to clear up some questions for Mr. Manu, and was able to sit in on a class taught by Miss Taylor. She is a fine teacher and seems to have a very nice rapport with her children. She teaches the infant 4-6 age group. She had the students up moving, jumping and doing many interesting things with counting. She also used bottle tops and sticks.

The next day, I located Mr. Tucker, Mr. Kamara and finally found Miss Cummings at her new station, The Children Service School at Wilberforce Barracks.

With the two gentlemen we talked about the correspondence course. I also gave Mr. Kamara the second part of the pretest which he missed during the January workshop.

I watched Miss Cummings teach a class on measurement. She had some difficulty trying to get students to add expression like:

$$\begin{array}{r} 6 \text{ ft. } 7 \text{ in.} \\ + 4 \text{ ft. } 8 \text{ in.} \end{array}$$

She asked me to help her out so I took the rest of the class period.

The next day I visited Miss Macauley. I answered questions about the correspondence course and discussed further some of the mistakes she had made on the pretest. Since she is the head teacher she wanted to show me around the school.

The rest of the time in Freetown was spent revisiting all of the aforementioned people. I saw each of them at least twice. Most of them I saw three times.

On the 15th and 16th I visited Mr. Ndanema in Moyamba. He was having difficulty trying to teach the idea of subsets and the number of subsets of a given set. I taught a full class period so that he could see the sets. We of course had to deal with the idea of the empty set being a subset of every set.

I travelled to Bo twice with no success. Mr. Harding was in Freetown and Mr. Bockarie was out with his teachers on teaching practice. Since Mr. Bockarie is rather advanced, I left a book on Transformation Geometry at his house and asked him to work in this book on his own. If he has questions, he is to write to me concerning them.

The next week I spent at Njala - grading papers. I have heard from almost all the people from Ghana and Sierra Leone. Not much word from Liberia. I think the Liberians are waiting to receive the textbooks.

March the 1st and 2nd I visited with Mr. Gbondo. He is another fine teacher. He too has very young children. Mr. Gbondo not only is a good teacher but is reasonably sound in mathematics. I have recommended him for the writing workshop in July.

On the 3rd day I travelled to the Kono district. The first person that I located was Mr. Aruna. He and the other three participants from this district felt lost, because they all came to the workshop at Port Loko a week late. I agreed to work with all four of them for the time I was scheduled in the district. It turns out that Yengema, Koidu are all within seven miles of each other. Therefore, I could get everyone together in one place (Yengema).

I had several intense sessions with all but Mr. Turner, who was out of the district on business.

I travelled to Njala and then Kenema - arriving to see Mr. Momeh-Navo on the 8th and 9th. They returned to work with the group in Knno on the 10th and 12th. Mr. Komeh-Navo and I spent most of our time discussing his difficulties with the pretest. He is the assistant head teacher, so we had plenty of time to talk.

In the 15th I travelled to Makeni. The easiest person to find was Dr. Dugba who teaches at the Training College. He is also pretty sound in Mathematics so we talked a small bit about some of the terminology in the correspondence course. Dr. Dugba teaches methods of teaching maths, therefore, I think he should definitely be a full participant.

I also visited with Mr. Spain-Young. We spent our time with his pretest and questions on the correspondence course.

Mr. Kamara and Mr. Koroma were in Freetown so I did not have the opportunity to see them.

I had another set back when I travelled to Lunsar. Mr. Kanu was nowhere to be found. Therefore, I travelled over to Port Loko to visit

with Sister Nancy and the Jacobs. We had quite a nice session. I gave them ideas on Ancient Maths and how this can bring about motivation in their classes.

I travelled the next day to Freetown to finalize Visas and other plans for my trip to Liberia. I then returned to Njala on the 24th.

On the 29th I visited with Mr. Ngebeh at his school in Lungi. He had quite a few questions about the correspondence course (no book). He is also interested in getting in to a University to further his studies. I encouraged him to do so. He is thinking about going to Njala. I told him that I would do whatever I could to help. That about sums it up for Sierra Leone.

In conclusion, let me note some things here for your consideration. First of all, I had a great deal of trouble finding places to lodge. It seems that officials at the places that I visited were not informed that I would need lodging. I had to chase around trying to find some place to stay at every stop I made.

In Koidu Mr. Aruna was kind enough to put me up for a couple of nights. I don't think it is his place to do this.

Further, it seems to me that stronger letters need to be sent to participants concerning my visits. There were two occasions that people were not at their post. My feeling is if these people do not have time to give to the Program, others should be put in their places.

JOHN W. ALEXANDER, JR.
MATHEMATICS EDUCATOR

West African Regional Mathematics Program

Report on Visits to Liberian Participants

by John W. Alexander Maths Educator

March 30 - April 24, 1971

I arrived too late on the 30th to make any visit so I started out early on the 31st. I travelled first to the University of Liberia in search of Mr. Paasewe. On my way in the gate I met Mr. Cleon. It seems that he is now attending the University and no longer at Harbel with the Computer Centre.

Mr. Cleon informed me that school would be out on Easter vacation starting the 5th of April for the whole week. Therefore, it would be difficult to see any teacher, unless special session could be set up for me to meet them as a group. We went out to Tubman High School to see if Mr. Bettie could help us arrange a group meeting for the coming week.

After talking with Mr. Bettie, it was agreed that I should drop in on Mr. Bai-Sherman at the Department of Education. Mr. Bettie and I met with Mr. Bai-Sherman the next morning. He agreed to set up the group meeting and make all of the necessary arrangements.

We finally got everything together on Wednesday the 11th at Gibson School. On Tuesday participants showed up, but the school was locked.

We met Wednesday and Thursday. The people in attendance on Wednesday were: Mr. Snoh, Mr. Bettie, Mr. Dennis, Mr. Cleon, Mrs. Thompson and Miss Yancy. On Thursday we had almost the same people except Mr. Flahn joined us while Mr. Snoh and Mr. Cleon were absent. Mr. Elliott was informed but did not turn up. Mr. Carr was ill and Mr. Maximore had a previous commitment.

I visited Mr. Sherman's class at his school on Newfort Street. He teaches night classes there.

The next week (13th to 16th) I visited participants at their schools. I visited Mr. Maximore at B.W. Harris Episcopal School, Mr. Flahn and Mr. Kimber at Monrovia consolidated School on Newfort Street and tried again to find Mr. Paasewe at the University of Liberia.

Mr. Maximore is pretty advanced, so we talked about how he might set up workshops to help other teachers. Mr. Flahn had some questions to ask that students had been posing to him. Most of these were just a question of knowing the accepted mathematical conventions. (Division by zero).

I visited Mr. Kimber's class. He seems to be a pretty good teacher. He probably should let students do more of the talking. He tends to lecture to them too much.

Instead of finding Mr. Paasewe at the University (Mr. Paasewe is not even registered there), I ran into Mr. Flahn again. He does some assistant work there. He introduced me to the Head of the Science

Division and the Dean of the Education School. The Dean asked me to come on Friday the 16th to meet with some of the mathematics lecturers. This turned out to be Mrs. Virginia Sherman and Miss Theodora Ward Jackson who is quite familiar with our program. We had a very interesting interchange. We talked about the problems they were having trying to implement modern maths at the University. I gave what suggestions I thought appropriate.

The week of the 19th I travelled up-country with Dr. Abeodu Jones, Director of Research for the Department of Education. Dr. Jones was a real help. She took very good care of me - making sure I got to places personally. I and the program owe her a great deal of thanks.

On Monday, Dr. Jones and I drove to Kakata to visit Mr. Snoh. Mr. Snoh had already attended a session in Monrovia, but he wanted me to visit the college and speak with students about modern mathematics.

I talked to the student body for about 45 minutes. My text included some history of mathematics, structure, and current development in the field. The students asked questions for another 15 to 20 minutes. This session was quite enjoyable to me at least.

On the 21st Dr. Jones and I took a small airplane to Robertsport to visit Mr. Diggs at Episcopal High School. We went into two maths classes taught by other staff. Mr. Diggs is an Assistant to the Principal, and does not teach at present. He does conduct workshops and seminars however.

He also took us to an elementary school where he helps train some of the teachers. We sat in on one Math class taught by a young Liberian man. I also had the opportunity to speak to the student body.

On Thursday morning I was escorted to the Radio and T.V. station to be interviewed about the program on radio. It was also arranged for me to appear on T.V. on Friday night on the "BE MY GUEST" Program.

At about noon Dr. Jones and I travelled up to Zorzor Training College. We stayed the night. I met with Mr. Johnson and another maths teacher for about an hour on Friday morning. Then I again talked with the student body. This whole session was taken up pretty much with both teachers and students asking questions about modern mathematics

We got back to Monrovia in time for me to go on T.V. that night.

On Sunday the 25th, I returned to Sierra Leone to pick up mail and do some other business. I ran into independence day celebration and did not get a plane out for Ghana until the 30th.

In conclusion, I would like to point out that not enough of the participants from Liberia are actually teaching. Further, we had no people from the University of Liberia's education department. I think we may be spending our efforts on people that will not spread the maths far enough. Well, these are things for your consideration.

JOHN W. ALEXANDER, JR.
MATHEMATICS EDUCATOR

Reports on Visits to Ghanaian Participants
by John T. Norris Maths Educator
February 1 - March 19, 1971

February 15 E.N.Y. Annan Accra (RMP.02)*

Very well planned out. Is actually teaching the BCI to the T-I's. Has lesson plans all thought out and also is using the SMP as resource material. Is very enthusiastic about materials and seems very interested.

Saw him teach a demonstration class in primary school, and he had the totally wrong idea about common members of a set. He had two bags, each with a pair of sunglasses in them and was asking for the common member. I hope he finally got it after I let him have it.

March 8 - 10 J.O. Ameyaw Adukrom (RMP.03)

Gave careful presentation and gave many examples. Had the class busy doing examples and they seemed to understand the set notation and how to work with sets.

Assignment One: Score: 16/19
Presentation: Adequate
Mistakes: Animals are infinite; "0" is not a digit
base 5; No. of letters in "mleme"

Assignment Two: Score: 5/26
Presentation: Adequate
Mistakes: Left out one and two completely 18 pts.
Found several missing digits (-2).
Went only to 36, not to 100 in base 6

Assignment Three: Score: 14/21
Presentation: Adequate
Mistakes: Negative whole numbers
box/box

February 9 K.D. Alordzi-Sosa Angola (RMP.013)

Extremely eager to learn. A suggestion about the rearrangement of the seating in the classroom was immediately tried out. It is obvious that he is reading the BC on his own and is coming up with his own questions.

While he is open to the new approach he doesn't seem to be all that fast in relating together all the implications of the theory. One gets the slight impression that he "yeses" without really understanding,

Mr. Bloku has gone to Cape Coast. The Principal is an old math man, but a little set in. The Vice thinks the old way was the modern way, but likes the emphasis on understanding. The T3's don't have any teacher

* Visits listed according to Registration Number.

this year, PCV Ron Olsen does some and the art master the 1st year. Also talked to student body twice. Worked some with the art master.

Assignment One: Score: 16/19
Presentation: Adequate
Mistakes: 10 is a digit; "mleme"; (95) is subset of (5,9)

Assignment Two: Score: 23/26
Presentation: Adequate
Mistakes: Place value and zero in Bab. and Egyptian went to 36 and not 100 in base 6

Assignment Three: Score: 21/21
Presentation: Good
Mistakes: None

February 11 - 12

S.O. Akwa

Ada (RMP.014)

Talks about enthusiasm for teachers as being important but is having to leave the teaching profession himself for medical reasons. Lesson observed was well organized and in small steps, but he is not clear on fine mathematical points (i.e. doesn't believe in irrational numbers).

Has asked to completely leave the Program. Also visited local primary-middle school. Teachers have modern books in 1-3, 7, 8, but no idea on how to use them - no teachers books. Only head teacher has one to a course. (Minta & Nyame - Nov.'70), but he is very weak.

March 8 - 10

H.P. Ampofo

Adukrom (RMP.020)

Continually explaining when teaching, asks few questions, needed some work on equality but got it straight. Teaching disorganized and if he is not sure he doesn't bring the class in to help. He is only 1/2 time math tutor, rest of time is history.

Assignment One: Score: 18/19
Presentation: Excellent
Mistakes: No. of letters in "mleme"

Assignment Two: Score: 7/26
Presentation: Adequate
Mistakes: Left out one and two (18 pts.)
Went only to 36 not to 100 in base 6

Assignment Three: Score: 13/21
Presentation: Adequate
Mistakes: Left out one possibility, didn't go to inf (twice) general case, found solution in whole number to $x + 6 = 4$

March 18 - 19

A.W. Doe

Peki (RMP.025)

Saw a lesson on fractions where had class shading regions. Did very little talking, had the students to the board to do work and explanation. They appeared to understand the new method but really had trouble with fractions themselves. For example one student took the fraction $9/8$ and split the unit square into (9) parts!! However, Doe appears to be an excellent teacher.

March 22 - Recommended to Ministry that he be alternate to writing conference.

Assignment One: Score: 18/19
Presentation: Adequate
Mistakes: No. of letters in "mleme"

Assignment Two: Score: 22/26
Presentation: Poor - not in order
Mistakes: Found two digits. Went only to 36 instead of 100 in base 6, didn't talk of place value with Bab. and Egyptian, wasn't clear on why not 7 in base 7

Assignment Three: Score: 21/21
Presentation: Poor
Mistakes: None

February 1

P.A. Dzila

Dzodze (RMP.031)

Appears to be an excellent teacher. Has a good classroom manner where students are encouraged to carry through on their ideas, correct or incorrect. Students go to the board often.

Seems to have good student rapport, is confident and easy going in a positive sort of way. Seems solid in math understanding.

Would appear to be the one most open to new teaching methods at Dzodze. (Math methods teacher not involved in program.)

February 1

C.N. Kissiedu

Aburi Womens (RMP.041)

Has a real enthusiasm and likes to do models. Had several for me to see. Also he made the three right pyramids to make a square. Spent a lot of time cutting and pasting, also working on slide rule.

Assignment One: Score: 16/19
Presentation: Good
Mistakes: Negative digits: "mleme"; disjoint sets

March 3

E.K. Gamedoagbao Akatsi (052)

Seems to have an adequate background in mathematics and a strong willingness to learn more. However, he is wedded to the old books (when I pointed out that the newest book they had was 1938- one 1912 - he was shocked because he had been looking at the printing dates).

When it was pointed out to him the graphing qualities of simultaneous equations, he was interested and then he appeared to really see why simultaneous equations act the way they do (straight lines) I worked out with him a week long lesson on the subject, even to the graphing of 3-D simultaneous equations, but that was beyond him.

In class very book problem centered, students do not go to the board, but are asked to participate and given time to work at their seats, with him walking around (see attached lesson plan)

Assignment One: Score: 17/19
Presentation: Too Brief
Mistakes: What is a digit; No. of letters in "mleme"

Assignment Two: Score: 24/26
Presentation: Good
Mistakes: Finding missing key, had both 0 and 1
 in base 6, went to 36 instead of 100

March 5

A.G. Shardow Aburi Meth (RMP.064)

Knows a lot of mathematics, but students on teaching practice and didn't see him teach. Seems to be more interested in math than in teaching, although this is just a guess. He is the strongest of the three.

Assignment One: Score: 16/19
Presentation: Adequate
Mistakes: Digits, 300 lbs. participant, "mleme",
 asked question on set of counting numbers
 being equivalent to the set of even numbers

Assignment Two: Score: 20/26
Presentation: Adequate
Mistakes: No place value and zero in Bab. and Egyptian
 zero is zero not 0, couldn't find the missing
 digit, Key (-2) "c" must be greater than zero
 for trans prop. to work.

Assignment Three: Score: 15/21
Presentation: Adequate
Mistakes: Negative whole numbers didn't go with nth term

JOHN T. NORRIS

Sample Letter from Participants

S.D.A. Training College,
P.O. Box 18,
Asokore-Koforidua
Ghana
May 10, 1971

Dear Mr. Norris,

I don't seem to understand questions A.6 and A.12. I will be glad if you can throw more light on them.

Thank you for your visit to our college. We have gained a lot and we are very grateful. We are looking forward to the next visit. Till then we wish you all the best.

Thanks for reading and bye for now.

Sincerely yours,

Sgd. E.D. Dor

J.K. ODURO ADUKROM TRAINING COLLEGE

NOTE:

1. I was ill for some time that is the reason for posting Assignment 6 late.
2. Question A 10 presented a difficulty because there is no clear example in the book. I arrived at the conclusion that I have to find the L.C.D. and I feel I am right.
3. There may be a mistake in Question 12 because Question 4 has fractions and not numbers.
4. The explanation you gave for Equal Sets is really useful.

Excerpts from a Letter to Ethiopian Participants

by

John Fitzgerald

Since the Mathematics Institute was held in Addis Ababa from 6 to 16 January, I returned to Kenya at the end of January to carry out a series of follow-up visits to participants of the December Kenya Institute.

During February and early March I was able to visit 22 of the 24 Teacher's Training Colleges in Kenya and also to see a good many supervisor participants at the same time.

First Follow-up Visits in Ethiopia

These began on 22nd March and continued for 4 weeks. Areas visited were mainly those where a Teacher Training Institute is located: Jimma, Harar, Addis Ababa, Debre Berhan and Asmara. In addition, calls were made enroute at Dire-Dawa, Makale and Gondar. Discussions were held with Provincial Education Officers, all Institute Directors and Math tutors and all Chief Provincial and some District Supervisors of Kaffa, Hararghe, Addis Ababa, Shoa, Eritrea, Tigre and Gegendir. It is intended to see the remaining provincial programmes on the next round of visits.

Teacher Training Institute Mathematics Programmes

My visits coincided with the recent exchange of Memoranda between the Ministry of Education and all Institutes concerning a review of the present syllabus in all subjects.

All Institutes have been following the existing Maths syllabus drawn up in 1961 E.C. by Addis Ababa T.T.I. for the transitional periods for student teachers entering since that year. This includes a syllabus for one-year Emergency Course entrants from 12th Grade.

Texts Used

For academic content the standard 11th Grade Secondary school texts are used and the basic text for Methods is the Maths Methods Booklet prepared by Miss V. Pow. In addition some institutes use as reference books Basic Concepts Vols. II & III and the Entebbe Handbook for Primary Teachers. Other reference materials are practically non-existent.

Films on Teaching Method

In all Institutes except Addis Ababa (which has its own copies) 2 or 3 of the Education Development Centre's African Mathematics Programmes films were shown to all students. These were also shown to groups of Primary Teachers in Jimma (90), Harar (90-100), Dire Dawa (30), Asmara (100 - 120). These films show actual teaching of some topics in African Primary School classrooms.

Tapes on Mathematics Topics

Each Institute was able to copy the twenty copies of the EDC prepared tapes which I took with me.

Activities of the Supervisors

In all areas visited discussions with Supervisors showed a very encouraging outcome of the January 1971 Institute and the previous one in August 1968 for over 90 supervisors. In Addis Ababa discussions with representative supervisors from 4 zones of the city revealed plans to begin in-services courses at Easter. In Shoa Ato Demmisse Woldemariam is planning Shoa in-service training. In Jimma already the primary teachers (more than 90) have been drawn into a seminar of over an hour for each afternoon in a week. The supervisors organised the seminar and the Maths lecturers were drawn from T.T.I. I showed the films to the same group during my visit and gave the primary teachers a summary of what new things to be aware of in preparing for the new syllabus in 1964 E.C.

In Harar the Supervisors had recently conducted a combined Social Studies/Mathematics Seminar for 4 days inclusive. Participants were District Education Officers and School Directors from throughout the province. The on-going objective is that these participants will organise similar workshops in their own Districts before 1964 year begins.

A pleasing development in most places I visited was that attention was being given to establishing centers for Teaching Aids in Institutes and Provincial Education Offices.

Correspondence Course

Because Basic Concepts I and II were not available for issue to participants in January all supervisors were given 2 of 4 assignments based on Basic Concepts III (Geometry) and the Training Institute tutors the first 2 of 4 Motion Geometry assignments. Up to the present some supervisors have already completed all 4 Geometry assignments numbered 12, 13, 14, and 15 and some excellent work has been sent in. The Basic Concepts I & II are now available and you will soon begin to receive the more satisfactory assignments beginning at No. 1 and continuing to 11. These require a thorough reading of the texts (see your introductory pages to the assignments which we gave you in January). You should work through the book example given and then check in the answers at the back. Only the ones marked "Written Assignment" at the end of each assignment needs to be sent in. You will find that the

completion of these assignments (4 in Geometry and 11 in Arithmetic/Algebra) will be most beneficial to your understanding of the Basic Concepts on which the primary syllabus is based. It is therefore IMPORTANT for you to do them all. I know that many of you are very busy, but the time factor is not so important.

You may take longer than is stated (2 weeks per assignment), but again I stress that completion of the 15 assignments is essential to the programme's success. In Kenya many college tutors have written to say how useful they have found them for giving them new insights into basic concepts and new ideas on how to present the topics to their students. Judging from the higher quality of the work which your supervisors have already sent in, I can only say that you must also be deriving much benefit from doing the assignments even though you are busy people. Send in any reports of in-service courses, seminars workshops (or whatever you like to call them) which you have conducted or will conduct before October. Good Luck and best wishes to you all.

Excerpts from a Letter to Kenyan Participants

by

J. C. FITZGERALD

Visits in Kenya to Teachers' Colleges and to Supervisors

Since 1st February, 1971, I have made a series of visits to all Provinces except Coast and have had discussions with all but two College Principals and Maths tutors. In addition, it was possible to see some College and Primary One classes and to make contact with a majority of supervisors who attended the Nairobi Institute plus some other assistant supervisors and A.E.O.'s who are doing a good job of in-service teachers of Primary One Mathematics.

Correspondence Assignments

The response has been encouraging. In the first term of a year, especially in this one, I know how busy both tutors and supervisors are. However I feel from my contacts with you and the welcome you have extended to me that the spirit is there and that you will catch up with assignments as the year goes on.

As I shall be absent for a month in Ethiopia from 22nd March, I am therefore sending you all the remaining assignments on B.C. 1 and 2 up to Number 8. If you can finish these by, say, end of April you will all be up to date. If you cannot, do try to do as many as you can. Some tutors have already written to say that the assignments have given them new ideas as to how to present certain topics to their students.

For college tutors I have changed in red figures the reference numbers of assignments 3, 4, 5 and 6 to apply to the Preliminary Editions

of Basic Concepts I. After No. 6 the references apply to both Preliminary and Revised Volumes II. Volume III was not given to tutors. One is now enclosed for all colleges.

Future Activities

On my return from Ethiopia I intend to repeat my visits. Next time I want to spend a full day in each college and I shall send the timetable of the exact day in advance. It would be appreciated if as many supervisors as possible could be at the college on that day. I shall also have the three films with me, and probably some tapes. These could stimulate discussion on teaching method aids, etc.

Next December we will have the second Mathematics Institute for the same participants, so do keep up with your assignments.

I look forward to meeting you all again in May/June.

Best wishes,
Yours sincerely,

John Fitzgerald
EDC Maths Educator

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.

Editorial Skills Development

WEST AFRICAN REGIONAL MATHEMATICS PROGRAM

by

Roger R. Hartman
Maths Editor

Part of an editor's responsibility is to insure that the diagrams, pictures, and charts selected by the writers are suitably transmitted into print. Providing trainee editors with graphic skills to assume this responsibility is one of the objectives of the trainee editor program.

This phase of the program will begin at the Fourah Bay Workshop. It will begin with the very basics - the drawing board and the T-square. From there training at this workshop will include as many of those topics listed below as time will allow. These topics will be examined only briefly and only as they relate to the production of graphic devices to communicate mathematical ideas. This part of the editor trainee program will continue when the trainee editors visit the University of Nairobi later in the program.

TOPICS: The care and use of drawing instruments
Lettering
Pictorial Projections (Isometric, Oblique, Perspective)
Elementary Orthographic Projection
Joining Curves; Pictorial Projections of Curved Surfaces
Scales and Dimensioning
Sectioning and Shading

INSTRUMENTS: Drawing board
Drawing paper
Pencils: HB 2H 4H
Pencil sharpener and sandpaper file
Eraser
Ruler
T-Square
Triangles
Dividers
Compass
French curves
Protractor