MARQUIS, Dave, 1920-
TRENDS IN SCIENCE EDUCATION: A STUDY OF EDUCATIONAL PROBLEMS IN SEVERAL AFRICAN NATIONS.

The Ohio State University, Ph.D., 1967
Education, general

University Microfilms, Inc., Ann Arbor, Michigan
TRENDS IN SCIENCE EDUCATION

A STUDY OF EDUCATIONAL PROBLEMS IN SEVERAL AFRICAN NATIONS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Dave Marquis, B.Ed., B.A., M.A.

The Ohio State University
1967

Approved by

John S. Richardson
Adviser
Department of Education
ACKNOWLEDGMENTS

The writer is indebted to many people for their interest in this work and for the time they have given him. Worthy of particular mention are the following: Mr. Julian W. Witherell and Mrs. Sharon Burdge Lockwood and other staff of the African Section of the Library of Congress, Miss Betty George and staff of the Africa Division of International Education of the Department of Health, Education, and Welfare, and Miss Louise Miller of the United Nations Documentation Center, all of whom gave personal time and helpful advice; the staff of Frederick A. Praeger, who allowed the writer the use of their publishing archives in New York City; the staff of the library of the State University College at Oswego, New York, who provided valuable assistance; Mr. Ernest Miller of Fulton, New York, who provided valuable technical assistance in the preparation of this paper; Dr. Robert Sutton, who gave direction to this paper in its early stages; Dr. John S. Richardson, who provided much-needed assistance at crucial periods in the development and completion of this paper; all of the Africans who gave of their time for the interviews which had great value for this paper; and finally, Catherine B. Marquis, without whose encouragement, understanding, forebearance, and love, this paper might never have been completed.
<table>
<thead>
<tr>
<th>Year(s)</th>
<th>Event</th>
</tr>
</thead>
</table>
| 1949-1955 | Elementary Teacher and Assistant Principal  
           Whitesboro Central School, Whitesboro, New York |
| 1952 | M.A., Syracuse University, Syracuse, New York |
| 1955-1956 | Training Officer, U.S. Air Force  
           Griffiss Air Force Base, Rome, New York |
| 1956-1957 | Junior High School Teacher  
            Westmoreland Central School, Westmoreland, New York |
| 1957-1958 | High School Science Teacher  
            Utica Public Schools, Utica, New York |
| 1958 | B.A., Utica College, Utica, New York |
| 1958-1960 | Instructor, Division of Science and Mathematics  
            State University College, Plattsburgh, New York |
| 1960-1961 | Academic Year Institute  
            The Ohio State University, Columbus, Ohio |
| 1961-1965 | Instructor, Department of Mathematics  
            The Ohio State University, Columbus, Ohio |
| 1965-1967 | Associate Professor, Division of Education  
            State University College, Oswego, New York |

**FIELDS OF STUDY**

**Major Field: Science Education**

- Studies in Science Education. Professor John S. Richardson
- Studies in Mathematics Education. Professor Harold P. Fawcett
- Studies in Higher Education. Professor Earl W. Anderson
- Studies in Physics. Professor Wave H. Shaffer
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>VITA AND FIELDS OF STUDY</td>
<td>iii</td>
</tr>
<tr>
<td>Chapter I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. EDUCATION IN AFRICA—Part 1</td>
<td>26</td>
</tr>
<tr>
<td>III. EDUCATION IN NIGERIA</td>
<td>97</td>
</tr>
<tr>
<td>IV. EDUCATION IN CAMEROON</td>
<td>158</td>
</tr>
<tr>
<td>V. EDUCATION IN SUDAN</td>
<td>194</td>
</tr>
<tr>
<td>VI. EDUCATION IN AFRICA—Part 2</td>
<td>235</td>
</tr>
<tr>
<td>VII. SUMMARY AND CONCLUSIONS</td>
<td>246</td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>258</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>279</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>323</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Since the end of World War II, the continent of Africa has been in a state of dynamic flux; it has been metamorphosing from the lethargic status of foreign colonial domination to boisterously progressive political independence. Twenty-six African nations have gained their independence within the five-year period ending in 1964.\(^1\) Inspired by their newly found freedom, African nations are moving swiftly toward the achievement of newly discovered goals. However, past surveys of Africa have indicated that no social or economic progress is possible until serious obstacles in the field of education have been overcome.\(^2\) Among the urgent problems, the solution of which is basic to the achievement of national goals, are the eradication of disease, the conquest of ignorance, the elimination of poverty, and the development of stable government.\(^3\) It is through the medium of education that these problems will be solved, and that the aspirations of the African peoples will come to fruition. At the Conference of African States on the Development of Education, held in Addis Ababa May 15-25, 1961, virtually every African

---

\(^1\) The United States and Africa (Washington: Department of State 1964), p. 1.


leader present reaffirmed his belief in education as providing the prime impetus toward the attainment of the aims of his people. ⁴

Among the numerous incentives for education in Africa, Campbell sees the following as being important:

1. External world conditions have caused Africans to become Africa-conscious. The participation of troops in distant campaigns has enlarged the horizon. Internal events such as the coming of the radio and transportation have helped create a new-found awareness of Africa's place in the world-to-be. This awareness is but one stimulus to educational enthusiasm.

2. Economic and social change has advanced with frightening rapidity. Education is swept along in its train and educational developments, equally rapid, are impatiently demanded.

3. Public opinion wants rapid education so that character can keep pace with material opportunity. The omnibus of materialistic opportunity is undermining the familiar moral, social, and societal landmarks. Education is looked to as the stabilizing force in the society to come. ⁵

Modern education in Africa must prepare boys and girls for mature roles in their society. It must help them to create a modern sense of citizenship, teaching them the meaning of good government and of law and order. It must train them to produce goods and services in order to accelerate the pace of progress in their countries. ⁶ Through education, Africans should be enabled to govern themselves. They should be able to solve their own problems and to compete as equals in international

⁴Greenough, op. cit., p. 16.


relations. At the Conference on Higher Education in Africa, held in Tananarive, Madagascar, September 3-12, 1962, the role of education in the social, cultural, and economic development of Africa was held to be:

1. to maintain adherence and loyalty to world academic standards;
2. to insure the unification of Africa;
3. to encourage elucidation of and appreciation for African culture and heritage, and to dispel misconceptions of Africa through research and teaching of African studies;
4. to develop completely the human resources for meeting manpower needs;
5. to train the "whole man" for national building;
6. to evolve over the years a truly African pattern of learning, dedicated to Africa and its people, yet promoting a bond of kinship to the larger human society.

In a speech delivered at the opening of the Institute of African Studies at Accra on October 25, 1963, Dr. Kwame Nkrumah, president of the Republic of Ghana, affirmed his belief that education should seek the welfare of the people, and recognized its importance in solving the economic, cultural, technological, and scientific problems of the nation. Indeed, the mobilization of human resources is a precondition for carrying out national material objectives, and since an illiterate and untrained population cannot cope with economics or technology, universal education has suddenly swung into the forefront of national enterprise. The public utterances of African political and educational

---

leaders attest to their recognition of the importance of education—and especially, scientific and technological education—in their respective national schemes.\textsuperscript{11} Indeed, the basic rights of individuals to attain full personality development through education are often guaranteed by the constitutions of their respective nations,\textsuperscript{12} although, at the present stage of national educational development, the likelihood of such self-fulfillment for most Africans is remote.

As a major objective of the Development Decade of the United Nations Economic and Social Council, ending in 1970, underdeveloped nations have set out to achieve as quickly as possible a minimum annual growth of five per cent in their national incomes. Beginning with education and training, they aim at increasing food production, exploiting natural resources, promoting industrial development and better housing, developing science and technology, expanding international trade, and many other things.\textsuperscript{13} The original United Nations document initiating the Development Decade stated that "the unutilized talents of their people constitute the chief present waste, and the chief future hope of the developing countries. . . . High priority must accordingly be given to establishing educational systems adapted to the economic and social needs of the developing countries."\textsuperscript{14}

Thus, at the national level, "education is regarded everywhere as

\textsuperscript{11} For examples, see Nos. 1 to 19 in Appendix A.

\textsuperscript{12} E.g., the constitution of the Republic of Rwanda. For pertinent excerpts, see No. 20 in Appendix A.

\textsuperscript{13} Joyce, loc. cit.

\textsuperscript{14} Ibid.
the key to progress, the most potent instrument for equipping the people at large for their new responsibilities, an essential factor in economic and social development of these newly independent countries in helping to reduce poverty and narrow the gap between them and the wealthier countries.¹⁵

The Place of Science in National Development

An unalterable fact of contemporary existence is the scientific and technical age which has emerged in relatively recent times. New developments in science and technology have brought with them changes in community and national thinking and in the personal lives of the people. In general, man is unprepared to cope with the modern civilization which has been thrust upon him by the world's scientific leaders. This fact of existence, so all-encompassing a problem in the well-developed countries, constitutes a matter of growth and survival for the emerging nations.

In a study developed by member organizations of the World Confederation of Organizations of the Teaching Profession and presented to the Eleventh Assembly of Delegates at Stockholm in 1962, among the questions to be reviewed were:

- Synthesis of traditional teaching and teaching of sciences;
- Insuring a steady supply of technicians by including more technical subjects in curricula;
- Introduction into modern society of the study of the history and philosophy of sciences as formal subjects;
- Greater emphasis on sociological subjects in school curricula;
- Democratization of the educational system;
- Complete separation of technical and professional training

from regular curricula vs. closer ties between academic teaching and technical and professional training.16

In directing the member organizations to review these questions, William G. Carr, Secretary General of the WCOTP, requested that they frame their replies specifically in response to the following five basic questions:

How are educational institutions at all levels responding to demands for technically skilled manpower?

How are educational institutions responding to demands for a culturally developed society capable of directing its own scientific potential?

What measures have been adopted by educators, by industry and by public authorities to use technical advance to improve teaching materials and techniques?

How are youth and adults being educated to lead a full life in the changed society produced by technological advance?

What measures are adopted in the educational institutions to instill and foster human values in the youth growing into a technical age?17

This paper will attempt to demonstrate, within the framework of the hypotheses which will govern it, that the emerging nations of Africa are engaged in the implementation of measures designed to enable them to respond in a distinctly positive manner to these questions. However, at the present stage of development, such a response would be qualified by the limitations imposed by current financial, political, economic, and educational conditions in these countries.18

According to James Avery Joyce, a British barrister and


17 William G. Carr, letter to National Member Organizations of the World Confederation of Organizations of the Teaching Profession, in Education in a Technical Age, op. cit., p. iv.

18 For an example of a response by one of the African member organizations of the WCOTP, see No. 21 in Appendix A.
consultant to UNESCO, who writes on United Nations affairs for British
and American publications, the magnitude of the educational task is
staggering. Referring to the world-wide problem, he states:

Nearly 1.5 billion persons live in the underdeveloped na-
tions, and some 700 million of them of school age or over can-
ot read or write. And mere literacy is not enough. The vast
numbers of workers who are needed to fill highly skilled occu-
pations must have intensive vocational training as well. At
least one million people must be trained as top-level admini-
strators, professional workers, executives, managers, and mid-
dle level technicians. All underdeveloped countries share a
pitiable shortage of high level manpower—scientists, agrono-
mists, engineers, administrators, business leaders, doctors,
and, of course, teachers.  

Joyce's statement implies, and one may further infer from the
present writer's earlier discussion of the needs of Africa, that science
and technology have important roles to play in the development of an
emergent society. Indeed, "any society in which life is increasingly
based on science inevitably becomes a more dynamic society."  
In this age of science, society is changing rapidly because of the influence of
science on human practical needs and because of its tendency to modify
human ways of thinking.  

How, then, should science be used to modify the societal struc-
ture of the African nations? More precisely stated, what is the role of
science education in this attack on the problems that beleaguer those

19Joyce, loc. cit.

20Abu Al-Futuoh Ahmad Radwan, Old and New Forces in Egyptian Ed-
ucation, Teachers College Contributions to Education, No. 973 (New York:

21Yusuf Salah El-Din Kotb, Science and Science Education in
Egyptian Society, Teachers College Contributions to Education, No. 967
who strive for the fulfillment of national goals?

In his study of science in Egyptian society, Kotb states that science education should be directed toward two major aims:

First, it should be made to help the individuals to achieve more effective adjustments in their lives when faced with novel elements in the situation. Second, it should be directed to contribute to the solution of social problems for the progress of society and general welfare of the people.22

It is the second of Kotb's aims that sets the dominant theme for the educational programs of the emerging nations. Yet, note how the following statements, which refer to science education in the United States, carry important implications for the newly independent countries of Africa:

A rapidly changing society stimulated by advances in science demands an educational program designed to meet the challenge of change.

Science teaching must result in scientifically literate citizens.

The strategies of learning must be related to the conditions that will lead to an understanding of the conceptual structures of science and of the modes of scientific inquiry.

Because science and the cultural scene are in a continuous process of change, the content of science courses must be constantly re-evaluated and, if necessary, revised to reflect major shifts in thinking and new interpretations of phenomena.

Organization of the science curriculum demands a dominant cognitive pattern.

A newly conceived curriculum prescribes a style of teaching consistent with the goals of instruction and with the nature of the discipline.

Laboratory and field work are central to the teaching of science.23

Recognition of the implications of the above-cited statements is

22Ibid., pp. 228-229.

leading populations of emerging nations, in Africa and elsewhere, to be prepared to accept enormous sacrifices in order to improve their potentialities. At the twenty-eighth session of the International Conference on Public Education, held in Geneva from July 12 to 13, 1965, the consensus of the reports of the member states indicated that, in recognition of the need for new faculties of science, polytechnical institutes, and vocational training centers, the people of their respective nations were willing to forego immediate personal gains in order to reap the eventual gains in economic and social development. Indeed, before any kind of economic assistance program can be effective, it must take into consideration the availability of technical manpower. Thus, for example, the United Nations Development Program has sought to bring strength to developing countries in technical areas related to economic growth by helping to establish polytechnical schools or engineering faculties, schools of forestry, agriculture and veterinary science, teachers colleges, and vocational instructor-training centers, agricultural experiment stations, fisheries institutes, and telecommunications centers.

Recognizing that the emerging nations have a long and arduous road to travel merely to come up to contemporary standards of scientific and technological excellence, the wide gulf between their present status and their goals is made to appear almost unbridgeable when one considers the criticisms lodged against technical education in countries which are considered to be in a high state of technological development. In June

---


1950, experts from twelve highly-developed member states of the United Nations, at the request of UNESCO, convened in an Expert Conference on Educational Systems and Modern Technology. Excepting for experts from three countries then in the process of industrialization—India, Brazil, and Turkey—no representatives from industrially backward countries were present. From papers prepared by the experts prior to the Conference, the following four points clearly emerged as an expression of the consensus:

The technical education at present given is wholly inadequate to future needs.

The general education given is lacking in the realistic, contemporary knowledge necessary for life in a technological society and inclines toward a bookish "know about" rather than a practical "know how".

The cultural content of technical education is inadequate.

Technical education (including apprenticeship and other forms of in-industry training) is liable to be too narrow in a world of rapid technological change.26

If highly industrialized nations need to improve their technical education, what difficulties must await the backward nations whose technical education has hardly begun? How much less prepared for a dynamic, modern world are those nations whose schools stress "know about" education far more, and "know how" far less than the more developed nations?

Standards of Educational Excellence and Criteria for School Science

Accepting, for the moment, that the status of science education in Africa is at a relatively low level, we must arrive at some conclusion as to what constitutes an acceptable level of performance in the

teaching of science before pointing the way toward improvement. In this respect, the literature abounds with criteria established by sundry experts, conferences, associations, and other interested groups. It is important, however, to keep in mind two points: (1) Although most of the standards, criteria, and goals stated in the literature apply to education in the United States or in other highly developed nations, they are in general quite applicable to the less well developed nations. This is probably true because, although the immediate needs of these nations may point toward rapid progress, with the objective of reaching economic and technological levels comparable with other nations of the world community, eventually the present backward nations must become coequal in leading the world toward still greater progress. (2) Although, in general, these criteria are applicable to African nations, the sights of the African educational policy makers may have to be set somewhat lower, at least for the near future.

In a report of the Seminar on the Teaching of Basic Sciences in African Universities, which met in Rabat, Morocco, from December 13 to 22 in 1962 under the sponsorship of UNESCO, the participants concluded that:

The essential aim of education should be to develop the scientific attitude and the ability to use the scientific method. This is particularly important in the modern age, when the body of scientific knowledge undergoes considerable development during a single lifetime. Our students must become capable, through their studies, of adapting themselves to subsequent changes. This orientation of education implies that the accent should be placed in all fields on principles and methods.27

---

The above quotation might very well have been from a source stemming from a more highly technological society. That it is African indicates that the erstwhile "dark continent" is setting worthwhile goals for itself in the field of education. Furthermore, the participants at the seminar intended that the above-stated aim of education is to apply not only to future scientists, but to all students. "It is essential in the modern world that a minimum general scientific training should be given to everyone. Specialization, and particularly the division between scientists and non-scientists should not occur too soon; it was also recommended that the division should never be absolute."²⁸

This minimum general scientific training, although always a prerequisite for successful adaptation to the modern scientific and technological world in which we live, is crucial for the populations of Africa, in order that they may understand the role of science in their lives. In this respect, the final report of the International Conference on the Organization of Research and Training in Relation to the Study, Conservation and Utilization of Natural Resources recommended that "campaigns should be systematically organized in each country with a view to drawing the attention of the population to the essential role which science and technology can play in solving the social and economic problems which hinder the efforts the African countries are making to raise the material and spiritual standards of living of their peoples."²⁹

²⁸ Ibd., p. 10.

Conference likewise felt that the promotion of greater public interest in science and in scientific achievements and in technical and scientific careers could serve to increase the relatively small number of students choosing science as a career in recent years. The Conference recommended introduction of science at the primary level, encouragement of science activities at the secondary level, adaptation of the content of science curricula at both secondary and higher education levels in order to encourage scientific careers in greater numbers, and a grounding in science for non-scientific personnel. In summation, it would appear that the Conference sees the goals of science education in terms of (1) a scientifically literate population and (2) a supply of trained scientists.

One study of new developments in elementary school science in the United States gives criteria for evaluating the status of elementary school science programs. The criteria imply that such programs should foster an attitude of inquiry, embarking the pupil on a quest for truth and introducing him to the scientific attitude. They further imply that scientific concepts should be introduced at the level of the child's understanding, and that he should be motivated toward further study. At this level, scientific inquiry and experimentation is designed to provide a sound base for lifetime learning, use, and understanding. At the elementary school level, it would appear that the emphasis is on the

\[30\text{Ibid., p. 47.}\]  \[31\text{Ibid., p. 48.}\]  \[32\text{Ibid., p. 43.}\]  \[33\text{Ibid., p. 33.}\]  \[34\text{Joseph Zafforoni and Edith Selberg, New Developments in Elementary School Science (Washington: National Science Teachers Association, 1963), pp. 3-4.}\]
beginnings of scientific literacy with, as yet, no great emphasis on careers in science. There is emphasis, however, on developing habits of scientific thinking and methods of inquiry.

The 1949 International Conference on Public Education stated its belief that one of the foremost aims of education is the encouragement of the scientific spirit of observation and experiment, that the introduction to natural science is particularly suitable for training in observation and experiment, and that therefore, natural science should be introduced from the very first classes of the primary school. The Conference believed that this introductory science should achieve the following objectives:

1. Develop a child's intellect by the use of activity methods based as far as possible on individual observation and experiment.
2. Stimulate the imagination and the sensitiveness of a school child by making him love nature and her beauties and by interesting him in natural phenomena and the various manifestations of life.
3. Support and foster all activity tending to protect and conserve nature.

In the science program of the secondary school, there seems to be a greater emphasis placed upon the preparation of scientists than there is in the elementary school. The Meeting of Experts on the Teaching of Science in Tropical Africa, which met in December 1960 at Abidjan in the Republic of Ivory Coast, recognizing the need for educated people to fill the multitude of new posts created by the recent spurt in

---

35 International Conferences on Public Education—UNESCO—International Bureau of Education—Recommendations, 1934-1960, Publication No. 222 (Geneva: International Bureau of Education, 1960), p. 80. Note: This publication is out of print. This writer feels that the text of Recommendation No. 27, concerning The Introduction to Natural Science in Primary Schools (1949) is so pertinent to this paper that he has appended it as No. 22 in Appendix A.
economic development in Africa, stated that "it is the duty of the secondary school to encourage a larger number of pupils to take up scientific careers, give all pupils a general scientific training and, in the terminal classes, offer a wide choice of scientific subjects, in preparation for the specialization inevitable in our modern scientific and technical society." It is worthwhile to note that this meeting of experts recognized the existence of a great need for the popularization of science and gave serious consideration to the various methods by which this might be accomplished among the illiterate, semi-literate, and literate peoples of Africa.

The 1952 International Conference on Public Education, recognizing that "modern life requires everyone to have a stock of basic scientific knowledge, so that he may better understand his natural environment and apply scientific discoveries to improving the community's standard of living," recommended that:

1. It is desirable that in secondary schools the teaching of natural science should be as extensive as possible, and in any case should provide a common core of fundamental knowledge for all pupils between 11 and 15 years of age and a wider and deeper study for certain groups of older pupils.
2. The teaching of natural science in secondary schools should provide pupils with basic knowledge about the world and man, give them experience in scientific method, and develop their general culture and sensitiveness.

37 Ibid., pp. 75ff.
38 International Conferences on Public Education, etc., op. cit., p. 114. Note: Recommendation No. 35, concerning Teaching of Natural Science in Secondary Schools (1952), is included in Appendix A as No. 23.
39 Ibid., p. 115.
Perhaps because the Conference convened at a time when the scientific explosion engendered by the Space Age had yet to occur, and because the backward countries of Africa had yet to achieve their independence, the conferees failed to recognize the role of science education in preparing scientists for the technology of the developing world and its soon-to-be-independent nations.

In general agreement with the views presented above are those of Richardson, who, by virtue of his association with the present writer, has influenced his thinking with regard to matters dealing with the philosophy of science education. In terms of the purposes of this paper, the view of the present writer is that the general objectives of science education consist primarily of the conferring of scientific literacy upon the populace of a nation, in order to fulfill a three-fold purpose:

1. That each member of a modern society may understand how his society operates within the framework of a modern scientific and technological world.
2. That the society may produce trained personnel in sufficient numbers such that the scientific needs of the society may be satisfied.
3. That the society may produce leaders who will extend habits of critical thinking— which they have practiced in a scientific atmosphere—to their tasks in providing political, governmental, educational, and other leadership to their respective communities.

Implicit in any discussion of the role of education in the attainment of national goals is the concomitant consideration of the nation’s ability to provide facilities and personnel for its educational system. That this is a serious problem in developing Africa is clearly stated by Joyce:

When UNESCO launched its major campaign five years ago, it estimated that, in tropical Africa alone, about 17,000,000 children were without classroom space; and that, even so, fewer than five per cent of the children who did attend primary school could go on to secondary school; while fewer than one per cent of all those attending school could enroll in vocational training institutes. At the same time, between 80 and 85 per cent of the adult population was illiterate. To achieve even a 75 per cent increase in primary school enrollment and a doubling of secondary school and university enrollment, at least 450,000 teachers would have to be trained.  

Apart from any consideration of the numbers of schools and personnel required even for general programs of education, there is the question of quality of education. In terms of the purposes of this paper, a school system will be considered to be pursuing in an acceptable manner the goals and objectives of education—and specifically, of science education—as outlined above, if it possesses, among others, the following qualities:

1. A professional staff, adequately trained in general education, academic subject specialty, pedagogical methodology, and professional ethics.
2. Professional administration, motivated toward progress in achieving the stated educational goals of the school system.
3. A well-designed teacher-training program.
4. Adequate facilities for science instruction, including laboratories and equipment for practical work, both teacher demonstration and student experimentation.

Survey of the Literature

A preliminary survey of the literature relating to science education in Africa revealed to this writer that such publications were relatively rare and difficult to obtain.  

---

41 Joyce, loc. cit.
42 See American Doctoral Dissertations on Africa (Washington: Library of Congress, 1962); also Helen F. Conover, Africa South of the Sahara (Washington: Library of Congress, 1963); also African Education:
The April 1959 issue of Science Education contains a number of articles concerning contemporary conditions in science education in several foreign countries. In one of these articles, Eells discusses his study of 15,000 doctoral dissertations in education written since 1905. According to him, somewhat over one thousand deal with education in foreign countries; of these 33 are concerned with science and mathematics education. In Eells's included bibliography, which contains no dissertations published after 1954, the present writer counted 24 dissertations related to science education, seven of which refer to African or Asian nations.

In a separate survey of doctoral dissertations and master's theses undertaken by this writer in 1964, it appeared that few African nations, other than Egypt, were represented in these studies. Indeed, nine doctoral dissertations studied Egyptian problems, while three studied other African nations; three master's theses were concerned with Egypt, while seven studied other African nations. The scarcity of available information on African nations indicates that these nations represent fertile areas for further study. Nowhere in this preliminary

---


study did there appear to be any comprehensive study which either summarized educational conditions in these nations or derived factors common to all. Of these 22 dissertations and theses, only two or three dealt with science education.

The Problem and Preliminary Procedures

The dearth of information relative to science education in Africa, coupled with this writer's recognition of the need for such information, has served to stimulate him to propose a study which would embody the following:

1. Investigation of the science education programs of several individual African nations, with the following emphases:
   a. History
   b. Philosophy
   c. Present needs and problems
   d. Structure
   e. Current programs and trends
2. Investigation of common trends and changes or directions in philosophy of science education
3. Summarization of problems and needs in science education common to most of the studied nations
4. Conclusions as to desirable directions for science education in the studied nations

The initial step in the research procedure was to communicate with the Washington embassies of the following nations whose addresses were listed in the current Diplomatic List of the Department of State.

Kingdom of Burundi
Federal Republic of Cameroon
Central African Republic
Republic of Chad
Republic of Congo (Brazzaville)
Republic of the Congo (Leopoldville)
Republic of Dahomey
Ethiopia

Diplomatic List (Washington: Department of State, 1964), passim.
France (The French Community)
Republic of Gabon
Ghana
Republic of Guinea
Ivory Coast Republic
Liberia
Kingdom of Libya
Malagasy Republic
Republic of Mali
Islamic Republic of Mauritania
Morocco
Republic of Niger
Nigeria
Republic of Rwanda
Republic of Senegal
Sierra Leone
Somali Republic
Republic of the Sudan
Republic of Togo
Republic of Upper Volta

From each of the embassies of the above-listed nations the following was requested:

1. Literature relating to the history, structure, and philosophy of education
2. Literature relating to problems and trends in science education
3. The name and address of the Minister of Education or other person with whom this writer could communicate for further information

Within a period ranging from two weeks to two months, all of the replies from those embassies which did respond had been received. The next step was to write to the respective Ministers of Education of those fourteen countries, as follows:

Federal Republic of Cameroon
Republic of Chad
Ethiopia
Ghana
Ivory Coast Republic
Liberia
Malagasy Republic
Republic of Mali
Islamic Republic of Mauritania
Morocco
Nigeria
Republic of Rwanda
Somali Republic
Republic of the Sudan

From each of the Ministers of Education the following information was requested:

1. Literature relating to the history, structure, and philosophy of education
2. Literature relating to problems and trends of science education
3. The minister's personal commentary on the current situation relative to science education in his country, with emphasis on current goals and the programs designed to meet these goals

Of all these requests for information, only two responses were received: from the Federal Republic of Cameroon and from the Somali Republic.

Based upon the responses and materials received from each of the respondents, and guided by the hypotheses which were set up for this study, interviews were arranged with nationals of Sudan, Cameroon, Togo, and Nigeria. To each of these interviewees were addressed questions designed to elicit responses such that they would provide support for or against each of the seven hypotheses which form the bases of this paper.

The chapter which follows will present a review of the literature as it pertains to the history, philosophy, and structure of education in Africa in general, with emphasis on sub-Saharan tropical nations. The succeeding chapters, for purposes of investigation, will be devoted to studies in depth of the educational systems of three countries: Sudan, Cameroon, and Nigeria. These three nations represent differing types of colonial backgrounds, languages, ethnic groups, and religious preferences, among other differences. This writer feels that the conclusions derived from a study of these three countries may well enable him to extend the hypotheses to other countries of Africa which
have similar backgrounds.

The paper will base its conclusions relative to the hypotheses upon documents and other materials acquired by the writer from African sources, from embassies of African nations, from the United Nations, and from United States governmental sources. Some of this material was acquired on personal visits to the Office of Education, the library of the Department of Health, Education, and Welfare, and the Library of Congress in Washington, and to the United Nations Documentation Center, several embassies and U.N. Missions, and publishers in New York City. Other publications were acquired by mail from Africa or from African embassies, or by purchase from publishers. The interviews with African nationals were tape-recorded by the writer and then transcribed; these will be used to reinforce the documentary evidence and to provide subjective reactions to educational experiences.

Since many of the publications used in this study are not readily available, this writer has included portions of some of those—which have not been directly quoted in the text—in Appendix A, when such inclusion has been deemed worthwhile. Also, portions of the transcribed interviews have been quoted in Appendix B.

The Hypotheses

1. The needs of African nations are such that the current emphasis in education below college level is on vocational training rather than upon science education.

The preliminary investigation of African education, as discussed above, reveals that there is a strong emphasis on vocational training in order to fulfill the economic and technological needs of the African
nations. This study will endeavor to investigate the relative emphases given to both vocational education and science education, and to consider those points at which they overlap.

2. Science education in African nations has higher prestige, and therefore greater priority, at higher educational levels than at other levels.

Although not stated above, preliminary investigation reveals that letters and law have enjoyed higher prestige than the sciences in higher education, with medicine enjoying a poor third place. This study will investigate the trends in the curricula of African higher education, and will compare them to those of the lower educational levels.

3. The educational programs (and, concomitantly, science education programs) of the African nations are to a great extent patterned after those of the "mother" nations of which they were colonies.

The earliest reading of African educational affairs will reveal the truth of this hypothesis. Rather than investigate an already admitted conclusion, this paper will concern itself with the manner in which the colonies were influenced by their imperial masters, with particular emphasis on the purposes of colonial education, the structure of this education, and its extent. Further, this paper will show how the contemporary structures of the educational systems of the nations under investigation are patterned after those of the "mother" nations.

4. Many of the problems of science education are common to many of the individual African nations.

5. Many African nations have common needs in science education.

6. Many African nations have common goals in science education.

Although the standards of living of the peoples of Africa vary from country to country and within any given country, in general, no country in Africa has achieved standards comparable to those of the more technologically advanced countries. It is safe to say, then, that in
order to achieve technological strength and industrial expansion, the nations of Africa must first solve problems in their respective educational systems, and in particular, in their programs of science education. This study will investigate the problems, needs, and goals of science education in Nigeria, Cameroon, and Sudan, and will attempt to relate these problems, needs, and goals to those of the other nations of Africa. That is to say, the intention is to perceive common factors in science education in the three nations under particular study and to extend these to the general African situation.

7. If many problems, needs, and goals are common to many African nations, then there should be similarities in the programs designed to meet these problems, needs, and goals.

The final step in this study will be to determine what is being done in the three nations under study to solve the problems of science education and to work toward the attainment of their goals. The study will take into consideration the programs being undertaken with internal initiative, as well as those programs which are the result of external or joint efforts. In this latter case, the study will consider the role of the United States, the United Nations, and other nations in enhancing the educational programs of the African nations.

Definitions

Several terms which are employed in this paper may have various usages in common parlance. To avoid confusion, these terms are defined, as follows:

1. Science education refers to the teaching of introductory general science topics at the elementary or primary school level, the teaching of general science at the middle or junior high school level, and the teaching of scientific subjects—such as physics, chemistry, and
biology—at the secondary and higher educational levels. In this paper, the term does not refer to the preparation of science teachers or to the field of research relating to science teaching or science teachers.

2. Science, as distinguished from technology, refers to the body of scientific knowledge which is acquired by the student through study of scientific subjects at all educational levels. This includes understanding of principles, acquisition of skills, and development of attitudes, all of which serve to make him scientifically aware, but do not primarily serve to prepare him for an occupation, unless he happens to be preparing for a scientific career.

3. Technology refers to industrial development which derives from scientific principles, and which employs technologists and/or technicians.

4. A technologist is one who has acquired post-secondary education with a strong emphasis in science, and whose work involves practical applications of science. He belongs to the top-level segment of manpower and his work may require inventiveness and/or administrative ability.

5. A technician, depending upon the degree of his skill or training, is a low- or middle-level worker whose occupation usually requires some understanding of scientific principles, but which usually does not require a high degree of inventiveness or administrative ability.

6. Technological education refers to the post-secondary education of the technologist, which may take place at an institute of technology, an engineering school, a faculty of engineering at a university, or some similar institution.

7. Technical education refers to the post-primary and/or post-secondary education of the technician, which may take place at a technical secondary school, a trade school, a comprehensive secondary school, or some similar institution.

8. Vocational education refers to the preparation of students for a trade. It takes place at both post-primary and post-secondary educational levels. Although the term includes technical education and commercial education, in this paper it will refer to preparation for occupations which do not fall into either of these categories. Vocational education may take place in a trade school, a comprehensive secondary school, a part-time day- or night-school, or some similar institution.

9. Commercial education refers to the preparation of secretaries and stenographers, as well as bookkeepers, etc., for employment in government or industry. Such education takes place at comprehensive secondary schools, part-time schools, and, in the case of higher-level occupations, such as accountancy, at post-secondary schools.
CHAPTER II

EDUCATION IN AFRICA—Part 1

Africa, with an area of 11,673,000 square miles, is the second largest continent; with a population of 311,300,000, it has a population density of less than 27 persons per square mile, about two-fifths of the population density of the United States. This study of the educational structure will confine itself to that area of Africa which lies approximately within 20° to the north of the equator; this tropical, sub-Saharan area is the Sudan of Lady Lugard and Martin. Within this area lie the three countries whose educational systems will be discussed in some


2Desmond W. Bittinger, An Educational Experiment in the Sudan (Elgin, Illinois: The Brethren Publishing House, 1941), pp. 3-4, quoting from Lady Lugard [Flora L. Shaw], A Tropical Dependency (London: Nisbit and Company, 1906), p. 7: "Ancient geographers called the same section of Africa sometimes Soudan, sometimes Ethiopia, sometimes Nigritia, sometimes Tekrour, sometimes and more often Genewah or Genowah... which has become Guinea; sometimes they called it simply Negroland. Always, and in every form, their name for it meant the Land of the Blacks... From the earliest periods of which we have any knowledge, Blackland has stretched, as it stretches now, from the west coast of Africa to the east, along the line of successive waterways which begins with the mouth of the Senegal, and ends only at the southern mouth of the Red Sea."

3Ibid., p. 4, quoting from P.F. Martin, The Sudan in Evolution (London: Constable, 1921), p. 2: "The Sudan, meaning the 'Country of the Blacks' and spelt variously 'Soudan,' 'Soudan,' and 'Soodan' was a geographical term applied to the whole of that vast region of Central Africa which is bounded by the Sahara Desert on the north, and south by the Nile-Congo and the Congo-Chad water partings, stretching from the Atlantic Ocean to the Red Sea, mainly between 4° and 18° N."
depth in this paper: Nigeria, Cameroon, and Sudan. These three countries represent extremes in terms of size, population, and population density; as mentioned earlier, they differ in historical background, particularly with regard to colonial influences.

**Historical Background**

One of the world's earliest civilizations, dating from 3400 B.C., was that of Egypt, which derived its great strength from the fertile farmlands of the Nile watershed. However, archaeologists, studying ruins of ancient cities and villages, have traced the existence of great sub-Saharan civilizations. At the headwaters of the Nile, the Kush peoples built great cities from which they extended trade routes to other parts of Africa during the period from 600 B.C. until about 300 A.D. In western Africa, Negro empires of Ghana, Mali, and Songhai flourished successively during the period from 700 to 1600 A.D. Beginning with their invasion and conquest of Egypt in 642 A.D., the Arabs introduced their language and the Moslem religion into northern Africa, later spreading their influence into sub-Saharan Africa through trade, conquest, and conversion to Islam.\(^4\)

The earliest European explorations of Africa were those of Portugal, which sent explorers down the western coast of Africa early in the fifteenth century. These expeditions extended their explorations and established settlements along the coast, culminating their great navigational feats with the voyage of Vasco da Gama around the Cape of

Good Hope to India in 1497-1498.  

The earliest contacts with the native populations were generally courteous and mutually respectful. The British, Dutch, French, and other European settlements which were established in the late sixteenth century served as coastal centers for trade with the interior. As the slave trade grew, forays into the interior led to strained relations with the coastal natives; in order to protect their nationals, the European countries took steps to establish domination over various coastal, then interior, regions. Beginning with the nineteenth century, relations with the Africans were less cordial and began to take on the aspect of master and servant. Despite the great steps toward independence which have occurred in recent years, there are still areas in Africa where colonial powers are exploiting the indigenous peoples in cruel and reprehensible ways.

By 1914, all of Africa was under European domination, with the exception of Liberia and Ethiopia. England, Belgium, France, Germany, Italy, Portugal, and Spain each had established itself as an African colonial power. Today, however, with the exception of the Spanish and Portuguese colonies and three British protectorates, all of Africa is independent. The achievement of independence, however, has not resulted

5 Africa, op. cit., p. 124.
8 Hunter, op. cit., pp. 7-9.
in the severance of all ties between the African nations and the former ruling powers. Monetary, economic, and military links still exist between former rulers and dependencies. Of more importance to this study is the extension of influence with regard to matters of language and education.

Before colonization, African communities did have their own forms of education, which, in the broad social context, meant passing on their own cultures and ways of life. Youngsters were prepared for their eventual adult roles in the community through association with the older members.

The young were taught how to cope with their environment: how to farm, or hunt, or fish, or prepare food, or build a house, or run a home. They were taught the language and manners, and generally the culture of the community. The methods were informal, the young learnt by participating in activities alongside their elders. They learnt by listening, by watching, by doing. In many practical ways they learnt how to live as members of their community.

When the European powers first invaded Africa, they relied upon the indigenous systems of tribal rule to maintain order. As they extended their power, the impact of their rule tended to weaken the existing order. As the tribal culture continued to be eroded, it became necessary for the ruling powers to initiate some Africans into the Western manner of governing. In order to fulfill their roles in the colonial governments, the Africans had to acquire a type of education which was

---


considerably different from that which had been traditional in their tribal societies.\(^\text{13}\) Thus, among the many new ideas and institutions which have been bequeathed to the new African nations are Western forms of government and systems of education.\(^\text{14}\)

Although colonial governmental needs were to provide the impetus for a more rapid growth and extension of education, these were preceded by the necessity for providing semi-skilled workers, artisans and clerks for expanding trade and industry. As early as four centuries ago, Portuguese missionaries established schools for these purposes.\(^\text{15}\) The first Catholic mission opened in the Portuguese colony of Angola in 1534. Acting as an agent of the state, the Roman Catholic Church, serving as "an instrument of civilization and national influence," has sought to spread Portuguese language and culture.\(^\text{16}\) Despite this early start, few Africans in the Portuguese colonies have acquired sufficient education to qualify for full Portuguese citizenship.\(^\text{17}\) Indeed, in response to Angolan demands for independence in the past few years, the Portuguese rulers have almost completely exterminated the few educated Africans in

---

\(^{13}\) For a discussion of the dynamics of change from traditional tribal rule to formal colonial government, see Lucian W. Pye, Politics, Personality, and Nation Building (New Haven: Yale University Press, 1962), pp. 12-13 et passim.


\(^{16}\) Busia, The Challenge of Africa, p. 81.

\(^{17}\) Busia, Purposeful Education for Africa, p. 25.
the colony, thus compounding the problems of government and unity, were Angola to become independent. 18

Colonial Patterns of Education

Western education spread rapidly through Africa in the latter half of the nineteenth century. Except for some training offered by commercial interests, virtually all education offered before World War I was provided by the missionaries. Islamic education of a traditional kind was offered in Moslem areas and tended to exclude missionary education; to this day, many of these areas are less advanced educationally than are those regions which had been provided with Western education.

Between the two World Wars, European governments began to examine their colonial educational structures with a view toward better serving the needs of their colonies. How they approached the educational tasks depended upon how they saw their roles as colonial masters. 19

Just as Portugal (theoretically) viewed its colonials as future Portuguese citizens, absorbing Portuguese culture and language, spreading the Roman Catholic religion, and maintaining colonial status, so it was with Spain, Belgium, and Italy. Unlike Portugal which, possibly reflecting its own high rate of illiteracy, provided only nominal support to education in its colonies, 20 Spain has provided good elementary and

18 Cohen, op. cit., p. 271.


secondary education, particularly in Spanish Guinea, and in the urban areas of Ifni and Spanish Sahara. During the period of Italian domination, there was an almost total disregard of native cultural, linguistic, and religious interest in Libya and Somalia. During the Fascist period, 1922-1941, the Africans were considered to be racially inferior and therefore not entitled to the social, economic, and political rewards enjoyed by Italian nationals. Few natives received any education, although the Roman Catholic Church built some mission schools. At the time of independence, both former colonies had tremendous educational tasks facing them.

In the Belgian colonies, the natives were deprived of their rights as free agents through the establishment of the Domain Privé, or eminent domain, in 1891 and 1892. This policy of exploitation led to a paternalistic attitude toward government of the colonies; there was no need, under this system, to train native leaders for government. (Note that this policy was to lead to grave political difficulties when the Belgian Congo received its independence.) "The two distinctive features of the Belgian system have been a utilitarian outlook and a close association with religious teaching. The Catholic Church is mainly responsible for education and has had a dominant influence in the majority of the schools." Thus, the pattern of education was directed toward the


22 Ibid., pp. 55-56 and 84.


24 Lord Hailey, "Differing Concepts of Education in Africa," in Education in Africa, Fourth Reprinting (Washington: World Confederation
development of literacy and proficiency in crafts. As a result of this policy, the rate of literacy and facilities for technical education in the Belgian Congo at the time of independence were among the highest on the continent, yet the proportion of native university graduates was among the lowest.\(^{25}\)

In the French colonies, the educational pattern was modeled on that of metropolitan France, with its primary objective the creation of a political and professional elite of high intellectual quality in the French image.\(^{26}\) Thus, the French policy was one of denationalization: "Their new populations were to become black Frenchmen; the language was to be French; Africa was to be but an extension of the French domain."\(^{27}\)

In the educational structure of the colonies, four principles remained constant: the universal use of the French language as the medium of instruction, guaranteed employment for those who had received post-primary education, emphasis on agricultural and vocational training in the primary schools, and academic secondary education equal in quality to that offered in France.\(^{28}\)

The early and continuing purposes of British colonial education, in both mission and government schools, were to provide "qualified Africans with a modicum of modern skills, in order to fit them for subordinate and routine tasks—for example, as clerks and bookkeepers—in the

\(^{26}\) Kitchen, op. cit., p. 5.
\(^{27}\) Bittinger, op. cit., p. 148.
\(^{28}\) Cowan et al., op. cit., pp. 8-9.
British administration and commercial establishments. Nevertheless, association with the European culture as represented by mission schools—which disregarded African culture and encouraged the emulation of European culture—led young Africans to aspire to the virtues of white Christian civilization. The various colonial governments gave financial assistance to the mission schools and encouraged good standards, but each colony was autonomous in educational matters, with perhaps the only conformity being imposed by adherence to the British examinations system.

French educational policy in its colonies was consistent, whereas that of Britain was not. Nevertheless, the educational opportunities in their colonies were far superior to those offered to Africans in the colonies of other European nations. This becomes readily apparent when one considers the state of educational advancement and economic, technological, and political progress in the respective independent nations of Africa. It is obvious also that those nations which are still under the yoke of colonialism are still further behind in these respects.

It might be noted at this point that Germany, although it lost its African (and other) colonies at the end of World War I, had an impact on African education. Like other contemporary colonies, those of Germany had schools which were run by church-related missions which,
like those of Britain, received financial assistance and supervision from the colonial governments. Perhaps the most important contribution of German educational policy was its encouragement of the use of vernacular languages in primary schools. This matter will be discussed at greater length at a later point in this paper.

Later Educational Policy

The early part of the twentieth century saw a growth of interest in African education. This concern reached a high point after the close of hostilities in 1918. The colonial powers began to see themselves in new roles with respect to educational obligations in their colonies. The first significant effort to consider education within the context of African social and economic conditions was made by the African Education Commission under the auspices of the Phelps-Stokes Fund in 1920-1921. The Commission had the following objectives:

1. To inquire as to the educational work being done at present in each of the areas to be studied.
2. To investigate the educational needs of the people in the light of the religious, social, hygienic, and economic conditions.
3. To ascertain to what extent these needs are being met.
4. To make available to the full the results of this study.

The Commission investigated educational conditions in Sierra Leone, the Gold Coast, Nigeria, British South Africa, Angola, the Belgian Congo, and Liberia. The Second African Education Commission continued the work of the first Commission with studies of the educational systems

---

of Kenya, Uganda, Tanganyika, Nyasaland, Zanzibar, Southern Rhodesia, Northern Rhodesia, Basutoland, Bechuanaland, Swaziland, Ruanda, Urundi, Portuguese East Africa, and Abyssinia; the study was made and completed in 1924. The reports of the Commissions covered such topics as the objectives of education and its adaptation to individual needs and to the needs of the community, organization and supervision of education, education of the masses and of native leadership, and the education of women and girls. Among the conclusions drawn were the following:

1. It seems clear that the educational policies of governments and missions have hitherto been inadequate and to a considerable degree unreal so far as the vital needs of Africa are concerned.

2. Though the educational facilities in Africa are to be largely credited to missions, and a really great service has been rendered by them to the Native people, many of the missions have yet to realize the full significance of education in the development of the African people.

3. The adaptation of education to the needs of the people is urged as the first requisite of school activities.

4. The adaptation of education to the needs of the individual and the community is increasingly emphasized in the recommendations of American and European educators.

5. The wholesale transfer of the educational conventions of Europe and America to the peoples of Africa has certainly not been an act of wisdom, however justly it may be defended as a proof of genuine interest in the Native people.

6. In view of the obvious need for relating education to conditions of life, it may seem surprising that some educated Natives have been opposed to any departure from the existing conventionalized school systems.

7. Every part of the school curriculum may be made to contribute to an increased respect for an interest in the rural environment of the school.

8. The natural outcome of a school whose curriculum reflects genuine interest in its community is the organization of activities without the schoolroom that blend intimately with the life of the groups from whom the pupils come.

9. The school curriculum, at present based so largely upon tradition and the demands of special classes in large cities in Europe, should provide increasingly for the immediate needs of the urban groups in African towns.

35 Ibid., pp. 6-7.
10. The provision for teaching the great modern sciences, which will subsequently become necessary, should not be limited by the traditional emphasis on literary subjects. [Italics mine.]

The importance of the Phelps-Stokes reports lies not only in the fact that they pointed up some of the shortcomings of the colonial educational systems and pointed the way toward improvement, but that they stirred the colonial powers, particularly France and England, to begin their own investigations of colonial education with a view toward improvement.

Thus, in 1923, the Secretary of State for the Colonies of Great Britain appointed an Advisory Committee on Education in British Tropical Africa. Among other subjects, the Committee concerned itself with (1) the encouragement and control of voluntary educational effort, i.e., the mission schools, (2) cooperation between government and other educational agencies, (3) adaptation of education to native life, (4) religion and character training, (5) attracting good British educators for colonial service, (6) grants-in-aid to education, (7) study of vernaculars and vernacular teaching and textbooks, (8) acquiring a native teaching staff, (9) inspection and supervision, (10) technical and vocational training, (11) education of girls and women, and (12) organization of the school system.

The explicit purpose of the Advisory Committee was the furtherance of education in the colonies; its implied goal was self-determination.

36 Ibid., pp. 20-46.

37 Advisory Committee on Native Education in the British Tropical African Dependencies, Education Policy in British Tropical Africa (London: His Majesty's Stationery Office, 1925), pp. 3-8, quoted in Cowan et al., op. cit., pp. 45-52.
then self-government in these territories. In 1925, the Committee issued a memorandum which enunciated the following principles:

1. Although educational policy will be centrally controlled, the government should cooperate with and encourage other educational agencies.

2. Education should be adapted to the mentality, aptitudes, occupations, and traditions of the various peoples, conserving as far as possible all sound and healthy elements in the fabric of African social life and adapting them where necessary to changed circumstances and progressive ideas in the interests of natural growth and evolution.

3. Every effort should be made to "improve what is sound in indigenous training" in the important fields of religion and character training.

4. The crucial field of education should be made attractive to the best British personnel available.

5. Grants should be given to voluntary agency schools that satisfy the requirements.

6. The content and method of teaching in all subjects should be adapted to the conditions of Africa.

7. The rapid training of African men and women teachers is essential so that they will be "adequate in numbers, in qualifications, and in character."

8. Village schools should be improved by the use of specially trained visiting teachers.

9. Thorough inspection and supervision of schools should be enforced.

10. Technical industrial training should be given through an apprenticeship training in government workshops.

11. Additional vocational training should be given in and through government departments.

12. Particular attention should be given to the education of women and girls.

13. An educational system should include "infant" (i.e., for children five to eight years old) and primary education; secondary education of all types; technical and vocational schools, some of which develop to university level in such subjects as teacher education, medicine, and agriculture; adult education.\(^{38}\)

In 1935, the Advisory Committee issued a second policy statement, The Memorandum on the Education of African Communities, which stressed the relationship between the school and community development. The 1944 report of the Committee, Mass Education in African Society, stressed the

need for educating the entire community, and emphasized the role which should necessarily be played by native leaders. The final Report, Education for Citizenship in Africa, published in 1948, pointed up the need for educating young Africans for citizenship in free nations.39

The first general plan for education in the French territories was drawn up in 1903; all school systems were to be patterned after those of metropolitan France. There was no attempt to provide education which would be related to the needs of individual colonies.40 The 1926 report of the governor-general of French Equatorial Africa, Réorganisant l'Enseignement en Afrique Equatoriale Française, decried the lack of success of previous educational policy and presented plans for the reorganization of the educational system in order to accomplish the following: (1) to give a modicum of education to most Africans and then send them back to their own communities before they could suffer dislocation from their agricultural or manual heritages, and (2) to give advanced instruction only to selected gifted students who would go on to service in government, commercial, or industrial posts.41

In 1944, the Brazzaville Conference, initiated by Félix Eboué, then governor-general of French Equatorial Africa, promulgated educational aims for all of French Equatorial Africa and French West Africa.42 The need for modification of the existing educational systems to take into account the new social, political and economic facts of the territories

39 Scanlon, op. cit., pp. 91 and 102-117.
40 Busia, Purposeful Education for Africa, pp. 22-23.
41 Scanlon, op. cit., pp. 119-130.
42 French Equatorial Africa includes the present nations of Chad,
was recognized. The objectives agreed upon at the conference included:

1. to reach and penetrate the masses, and teach them a better way of life (i.e., the civilizing mission);
2. to select and train an elite—those capable of forming higher social or economic groups—to man the lower-level administrative posts in the governments;
3. to form at least one class in each village with fifty children of school age;
4. to stress equally the education of girls and that of boys;
5. to teach in French;
6. to adapt the primary-school curriculum to local needs;
7. to maintain free education, open to all regardless of race, creed, or sex;
8. to work toward universal compulsory primary education;
9. to develop a network of secondary and technical schools in each territory, equal in every respect to those in France; and
10. to provide opportunities for higher study in France by qualified Africans.

Although this policy took greater account of the needs of the native peoples, it "was, in fact, still dominated by the design to spread the French way of life, and to produce educated Africans who would be at home in French culture." The role of education in France's overseas possessions was again reviewed in 1948, when the Committee for the Modernization of the Overseas Territories presented its first report. The general educational plan contained therein served as the basis for further development in the French territories for the duration of the colonial period. Some of the notable points in the report are:

Gabon, the Congo Republic (Brazzaville), the Central African Republic, and also included the eastern portion of what is now the Federal Republic of Cameroon. French West Africa includes the present nations of Senegal, the Ivory Coast, Dahomey, Niger, Upper Volta, Mali, Mauritania, Togo, and Guinea.

43 Busia, Purposeful Education for Africa, p. 23.
45 Busia, loc. cit.
46 Commission de Modernisation des Territoires d'Outre-Mer.
1. Colonies of other nations had higher proportions of children attending school.
2. Economic development and educational employment are closely related. It would be detrimental to provide education to young people who could not subsequently find employment according to their aptitudes.
3. Primary education should be extended to all children.
4. Provision should be made for the training of native technicians. Technical schools of various types should be constructed.
5. Institutions of secondary education should double their enrollment in ten years; also, institutions of higher education.
6. Schools of higher education of various types should be constructed.
7. The numbers of the teaching staff should be increased at all levels.
8. All initial costs of the Plan are to be borne by the mother country. Part of the operating costs would be borne by the mother country, but each colony would have to take over the entire cost eventually.47

Religious Influences on Education

As has been noted earlier, practically all western-oriented education in Africa was, for over three hundred years, in the hands of Christian missionaries. The Portuguese were the first, establishing Roman Catholic missions on the Angolan coast as early as the sixteenth century. Other European traders and missionaries established schools along the Gold Coast in the seventeenth century.48 At various times during the eighteenth, nineteenth and twentieth centuries, missionary groups introduced education into other parts of Africa.49 The primary aim of both Protestant and Catholic missionaries was to establish Christian churches in the area. Schools were considered of prime importance

47 Scanlon, op. cit., pp. 119 and 132-140.
48 "Educational Activities in the Cape Coast, Ghana," Foreign Education Digest, XXVII, No. 2 (October-December, 1962), p. 121.
49 Kitchen, op. cit., p. 326.
in achieving this goal. Besides, in order to establish a native clergy—without which no church could hope to achieve total acceptance by the indigenous peoples—it was necessary to have an educational basis for the preparation of ministers and priests. Thus, primary schools were necessary for mass education, but secondary schools were indispensable to prepare students for teacher training colleges or religious seminaries.  

Among the first activities of the missionaries was the necessary task of learning the native language. In so doing, they provided the pioneering efforts to create alphabets and lexicons of the native vernaculars and, incidentally, developed many of the tools of contemporary linguistic research. The missionaries introduced reading and writing to the native populations and wrote books, most of which were translations of the Scriptures.  

In areas where the only schools were those provided by the missions, government assistance was provided. In the Belgian Congo, although both Protestant and Catholic missions were free to operate schools, the bulk of governmental support went to the Catholic missions. Secular schools did not open in the Congo until 1955. In


French Equatorial Africa, the government granted subsidies to the mission schools, based upon the number of students, the numbers of graduates, and the numbers of entrants to higher schools.\textsuperscript{54} In the British colonies, although a number of government schools were established, particularly secondary schools, the government was willing to leave the bulk of primary education to the missions. Grants to these schools were given, based upon the report of a government inspector.\textsuperscript{55} In today's schools, the independent nations continue the practice of supporting mission schools.

Religious groups depend upon government grants for maintenance of schools, and there are few groups that could maintain schools without government support. In most of Africa, this has meant that the churches accept the regulations and requirements established by the ministries in order to receive grants in aid. But to date, the regulations and requirements have been concerned primarily with the physical plant of the school and the professional staff. The content of the curriculum has been determined by the examinations system that has been, for the most part, non-political.\textsuperscript{56}

\textbf{The Moslem Influence}

In order to understand the educational systems and problems of Moslem countries, it is necessary that the primacy of religion be emphasized. For the Moslem, "religion is the value that comes first in politics, in social point of view, and in any program of fundamental


\textsuperscript{55} Ibid., Volume I, p. 728.

Religious education is basic to any Muslim society, and Islam carries with it a traditional system. This will vary in detail according to geography, history, and local custom, but the general pattern is constant, and the unity is at once obvious in communities as racially different as those in Malaya, Africa, or the Muslim areas of central Asia.58

Until the fifteenth century, elementary education, consisting of reading, writing, and arithmetic, advanced through the towns of Europe and North Africa, as well as of central Asia, as Arab science and culture expanded through these areas. As the European Renaissance waxed, so did the Arab culture wane, until elementary education became rare and little valued. Small religious schools continued to exist, where the male children were given an education which consisted of learning verses from the Koran by heart. It was not until the nineteenth century that the Arab revival began, gathering impetus slowly until the virtual explosion of Arab nationalism after World War II.59

In North Africa, and in those parts of Africa where Islam has established itself—e.g., British West Africa, French Equatorial Africa, Northern Nigeria, the Sudan—elementary education took place in the Koranic, or Quranic, school. Some Koranic schools went far beyond the elementary level, teaching not only the Koran, but also law and sciences.

But the Quran school at its simplest consisted of a teacher equipped with a wooden writing board, surrounded by


children, also with boards, who memorized the Quran from the teacher's recitation. The teacher was often a peasant farmer or a cattle trader, whose own knowledge was limited. The children did not pay fees, but worked on the teacher's land in return for what knowledge he was able to pass on to them. They spent many years—often a whole childhood—in this manner. They acquired the ability to recite the Quran, usually without understanding; sometimes also the ability to transcribe Arabic letters from sight, but seldom any degree of literacy in Arabic; probably also the ability to count up to a limited number—usually ten. They also learnt the elements of prayer and social duties.60

Despite the advance of western civilization, and the influence of European education, the Koranic schools continue to thrive today, particularly in rural areas, but also in villages and towns. In the Sudan, there exist khalwas, or Koranic schools, which serve as pre-elementary schools. In areas where elementary schools are not available, this is the only education received, usually by boys only, but occasionally by girls.61 Beyond the khalwas, not only in the Sudan but in other Muslim countries, there are often higher types of Koranic schools, in which students study the Koran in greater depth. The methods of learning and teaching are similar to those practiced in the medieval world, involving memorization of passages from the Koran. Classical texts are read aloud and this is followed by a standard commentary. The students are required to learn both the original work and the commentary and, very often, the chain of authority down from the first narrator, or commentator, to the pupil's own teacher.62

The higher khalwas are often very large, having over 600 pupils

60 Hiskett, loc. cit.
61 Personal interview with Mahmoud Salih Hassan of Sudan, at the Ohio State University, August 21, 1964.
62 Hiskett, loc. cit.
who board in small rooms around or near the khalwas. Some students may spend a lifetime in them, learning the Koran by heart until they can recite the entire Holy Book verbatim, and learning the philosophy, laws, and morality contained therein and in the commentaries. Before the advent of western education in Moslem Africa, this was the highest and the only type of learning.  

In some respects, then, the influence of Islam on educational development appears to be a negative one. For instance, (1) Islam is intensely conservative and, therefore, resistant to change; (2) Islamic education, as we have seen above, is restricted in aim and content; (3) Islam is a man's world where the status and, concomitantly, the educational growth of women is low. On the other hand, there are many positive aspects to Islam: (1) It develops intense group loyalties; (2) its members are devout; (3) the universal use of Arabic is a great cohesive (and educational) force.

Christian, Moslem, and Secular Forces toward Educational Development

As European influences moved into areas where the Moslem religion was dominant, strong local opposition arose against the introduction of teaching in a foreign language. It was felt that such teaching would serve surreptitiously to undermine the Moslem faith, and perhaps replace it with Christianity. In some areas, on the other hand, the

---

63 Personal interview with Ali Mohamed Ali of Sudan, at the Ohio State University, October 31, 1964.

64 Carpenter, op. cit., pp. 96-97.

65 Ibid., pp. 98-99.
foreigners—particularly the British—gave some financial assistance to the Koranic schools. 66

In many of the areas of Africa where animism was the religious force, the local people have been attracted to Islam for many reasons, in preference to Christianity. Wherever Islam has gone, it has established Koranic schools to which Africans have been attracted because of their desire to learn to read and write. In addition, Islam has been appealing because it was presented to Africans by Africans, in contrast to Christianity. Islam has entered African community life without disrupting it, particularly in dealing with polygamy. Christian insistence on monogamy, in contrast, has served as a disruptive force which raises grave social and economic problems in the community life of African society. 67

As a consequence of the attractiveness of Islam to converts, and of the suspicious attitude toward European education, development of modern education in the Moslem countries was severely retarded, and remained at the khalwa level, except for the few higher level khalwas. With the emergence of nationalism, however, the Moslem nations sought to extend educational facilities as a prerequisite step toward social, political, and economic progress. As models for their educational systems, the respective Ministries of Education chose the school patterns that were already in existence in the urban areas, these were, in general,


copies of the school systems of the colonial masters—that is, French and British in most of the Arab world, with the exception of Libya and Somalia, which were influenced by Italy. Despite the influences of the "mother" nations, the educational systems of all of the Moslem nations in Africa have one common feature: the study of the Koran is required in all of the elementary schools. 68

Language As a Factor in African Education

A problem which arises from the emulation of the educational system of the "mother" country involves the necessity of making a choice between using either the native language or the imported language for official and educational purposes. The newly independent nations are torn between a desire for national identity based upon native roots, culture, and language, and the necessity for maintaining the use of a European language for purposes of education and communication. According to Professor Richardson of Hamilton College, "The continued teaching of English and French can easily be defended. With over 700 vernacular languages in Africa—sometimes hundreds within one country—the English and French languages provide channels for communication and progress otherwise almost wholly missing." 69

Africans themselves have come to recognize that command of a world language is essential if they are to function to best advantage in the new setting of independence, internationalism, commerce, technology,

68 Rugh, op. cit., p. 460.

and modern living. Thus, English is fully and solely official in Kenya, Liberia, Nigeria, Sierra Leone, Rhodesia, Uganda, Zambia, and Gambia; it is co-official with one or more other languages, native or colonial, in Cameroon, Ghana, Mali, Somalia, Malawi, South Africa, Sudan, and Tanzania. French is the sole official language in the Central African Republic, the Brazzaville Congo, Dahomey, Gabon, Guinea, Ivory Coast, Mali, Mauritania, Niger, Senegal, Togo, and Upper Volta; it is co-official in Algeria, Burundi, Cameroon, the Leopoldville Congo, the Malagasy Republic, and Rwanda; it is semi-official in Morocco, Tunisia, the United Arab Republic, and fairly widespread in Ethiopia and Ghana. Also, there are remnants of colonial speakers of Italian in Libya, Somalia, Eritrea, and Ethiopia; Spanish is spoken in the Spanish colonies; Portuguese is spoken in Angola, Mozambique, and Portuguese Guinea.70 Besides these European languages, Arabic is official in Algeria, the United Arab Republic, Libya, Morocco, Sudan, and Tunisia, and Amharic in Ethiopia, Malagasy in the Malagasy Republic, Kinyarwanda in Rwanda, Afrikaans in South Africa, and Swahili in Tanzania.71

The Somali Republic has a unique problem with regard to language as a tool for communication and education. Despite the fact that it is perhaps the only nation in Africa possessing a single language (hampered only by geographical dialectical differences), which is spoke by virtually all of its inhabitants, the fact that the language has no written script prevents its use either as a medium of education or for written communication.70 Mario Pei, How to Learn Languages and What Languages to Learn (New York: Harper and Row, 1966), pp. 159-177. Cf. Africa, op. cit., p. 93.  

71Africa, loc. cit.
or printed communication. Political leaders have been unable to agree on the script to be used for the Somali language; protagonists fall into three camps, depending upon whether they favor the Osmania script, invented by a Somali, Osman Yusuf, in 1923, the modified Arabic script developed by a Somali, or the Roman script developed by English, Italian, and Somali authorities. There are two excellent reasons for settling this disagreement quickly: (1) Since all publications are printed in either English, Italian, or Arabic, each of which has a limited number of readers, they do not serve as mass media of education. (2) The plan of the Somali Republic is to unify the two systems of education—Italian in the south and English in the north—so that in both parts of the country the duration of the three pre-university stages will be 4-4-4, and to make Somali the language of the elementary school and English the medium of instruction at the intermediate and secondary levels.

Africans have no fear that their native languages will disappear—indeed, few have disappeared under contact with world languages. Despite the almost universal desire to maintain the use of the vernacular for cultural reasons, most Africans prefer the use of world languages for purposes of education and upward social movement. This is evidenced by the preferred use of the vernacular as the medium of instruction in the lower primary grades, followed by ever-increasing use of a world

---

72 Somali Republic, Publication 7453 (Washington: Department of State, 1962), pamphlet.


language as the student moves up the educational ladder. For example, Swahili is the medium of instruction in the primary and middle schools of Tanzania, but English is taught and used as the medium of instruction late in the middle school and thereafter. In Guinea, French is the principle medium of instruction, but a determined effort is being made to extend the knowledge of Foulah, Soussou, and Malinke, the three major vernacular languages. Before World War I, the German colonial administration in Togo introduced the written form of Ewe (devised by missionaries) into the primary schools, but made German the language of instruction at the higher levels. Except that French has now replaced German, the same state of affairs exists, with the independent government even more strongly promoting the use of Ewe for education, communication, and official use. Similarly, after the Cameroons passed from German to French domination after 1918, the colonial government tried to make French the official language in all of the schools, but were forced to continue the use of vernacular languages in the primary schools, as is the practice today.

Paradoxically, although the teaching of the Koran and of the

---

77 Kitchen, op. cit., pp. 533-534.
78 Schlunk, op. cit., in Scanlon, Traditions, etc., pp. 39-44. Also personal interview with Nicholas Amouzou Adankpoh of Togo, at the Ohio State University, July 17, 1964. Also personal interview with Edouard-Raphael Placca of Togo, at the Ohio State University, October 25, 1964.
Arabic language serves as a unifying factor among Moslem nations, yet the differences between colloquial Arabic and the classical Arabic of the Koran are such that students are placed in the rather uncomfortable position of having to learn a "new" language which is somehow familiar, yet foreign. They use colloquial Arabic in the home and in school to learn their other subjects, and the classical language in learning the Koran and the written language. 80 To compound the problem, the elementary schools are faced, as they are all over the world, with the problem of preparing students for secondary education, which in turn must prepare them for the university. In Moslem countries, this means that a foreign language must be taught as a subject in the elementary school, since this language will serve as the medium of instruction at the secondary level and above. Although classical Arabic serves as a cohesive factor in terms of its use in the press and radio, its vocabulary is poor in technical and scientific words; thus, its utility is limited for purposes of scientific study. The non-existence of modern Arabic literature and textbooks in scientific and other fields is basically the reason for the prevalent use of English or French as the medium of instruction in the secondary and higher schools of the Arab nations. 81

To sum up the highly complex problem of the use of African vernaculars, let us consider the pros and cons. First, many nations may have several dozen languages spoken within their borders, acting as barriers to communication between ethnic groups. 82 "In addition, they do

81 Asia, Arab States, Africa, etc., op. cit., pp. 39-41.
82 Hailey, op. cit., p. 6.
not generally have an adequate alphabet, grammar, literary texts, or a vocabulary rich enough to translate ideas and denote the things used in modern government, education, or politics. The fact that these languages have no international reputation would also preclude their use on the forum of nations.\textsuperscript{83} The multiplicity of languages within a nation's borders makes it difficult and expensive to publish books in the native language. This is most apparent in the production of textbooks, particularly at the primary level.\textsuperscript{84} At the university level, sciences are taught in European languages in all African nations, although Arab countries are tending toward the use of the national language, because of the difficulties involved in communicating scientific thought in vernacular languages.\textsuperscript{85} Arguments are made for the retention and expansion of the use of vernaculars in terms of the need for preserving African cultures, the pedagogic ease of learning to read and write in the mother tongue, and the ease of extending literacy to adults.\textsuperscript{86} Arguments favoring the use of European languages are (1) that it enables communication to take place between different ethnic groups in the same country, between African countries, and between African and non-African


\textsuperscript{85}The Teaching of Sciences, etc., op. cit., p. 17.

\textsuperscript{86}Hailey, loc. cit.; also Busia, Purposeful Education for Africa, p. 33; also Ki-Zerbo, loc. cit. See also "Literacy Teaching in an African Environment," Unesco Chronicle, XI (February, 1965), pp. 47-52.
countries, (2) that scientific and literary works have been published in these languages, and (3) that Africans seek the status that comes with knowledge of an international language.

Most African nations take the position that international languages should take precedence as the media of instruction in their schools. However, many are taking steps to preserve the most widespread vernaculars in order to continue their cultural heritage. This is in line with the UNESCO belief that there is a need for local languages in basic education. In 1965, the UNESCO Executive Board authorized René Maheu, director-general of UNESCO, to draw up a long-term plan for the transcription of African languages and the unification of their alphabets. At the inauguration of new buildings of the Regional Centre for Educational Information and Research in Africa on February 27, 1965 in Accra, Ghana, Mr. Maheu had the following to say on the issue of language:

I need hardly emphasize the fact that language work is an important and essential part of all curricula. Unesco has long been interested in the problems that arise from the diversity of languages in many countries of Africa and elsewhere, and in particular in the difficulties experienced in the process of education in passing from a local language to a language of wider communication. Such problems require intensive study with a view to assisting both educational administrators in selecting languages for mass literacy work and school-teachers in coping more efficiently with the teaching of their medium of instruction, it being understood that the choice of a language for a mass literacy programme or as a medium of instruction is the right and the responsibility of the governments.

---

87Busia, loc. cit.
88Hailey, loc. cit.
The Educational Systems of Britain and France

Since the majority of independent nations of Africa are continuing to pattern their educational systems after those of Britain and France, further examination of these systems and their problems and needs will perhaps be simplified if we first examine the systems of the parent nations.

Education in England

Although three years of nursery school, starting at age two, are available in England, compulsory school attendance is of ten years' duration, starting at age five. At the end of six years of primary school the students' abilities and achievements are assessed with regard to suitability of placement in various forms of secondary education. At this point, students are placed in either the secondary grammar school, the comprehensive (or bilateral) school, the secondary technical school, or the secondary modern school; these schools offer different types of programs, ranging from the traditional, classical offerings to technical and trade offerings, or combinations of these. As is the case with government primary schools, independent schools offer six years of primary school (preceded by as much as three years of nursery school) and lead directly into independent or direct grant secondary schools. It is

possible, at the end of the primary school, to progress into any type of secondary school, given suitable ability and aptitude. After two years of secondary school, abilities may be re-assessed, and pupils who develop later may transfer to another type of secondary school. Although school is not compulsory after the fourth secondary year, an additional year allows the student to sit for the General Certificate of Education, Ordinary Level. Possession of the certificate enables the student to continue in Sixth Form studies (except in the secondary modern school); these two additional years enable the student to sit for the General Certificate of Education, Advanced Level. Possession of this certificate allows entry into the university, which grants a university degree or a teaching qualification.

Instead of taking up Sixth Form studies, the holder of the Ordinary certificate may either enter a full-time training college, which leads to a teaching qualification, or may study full- or part-time at a school of art, which grants a diploma and/or a teaching qualification, or at a school of music, which grants a diploma and/or a teaching qualification, or at a technical college, which grants a diploma, the Ordinary National Diploma, the Higher National Diploma, the Ordinary National Certificate, or the Higher National Certificate, or may study part-time at an evening institute for the Advanced Level of the G.C.E. or for a diploma. It is possible for a "drop-out" to attend an evening institute to complete studies for the Ordinary Level certificate, if he wishes.

There appear to be two outstanding trends in modern British education: (1) the movement toward the junior school or department, consisting of the three years before secondary education, and (2) the
opening of new types of secondary schools which emphasize vocational and technical training.\textsuperscript{92}

\textbf{Education in France}

Education in France starts at age seven with five years of primary education (\textit{enseignement élémentaire}), which may be preceded by as much as four years of pre-primary education (\textit{enseignement préscolaire}); this is followed by four years of lower secondary education (\textit{enseignement du premier cycle}) and one to three years of upper secondary education (\textit{enseignement du second cycle}). Completion of the third year of upper secondary education with the appropriate certificate permits entry into higher education (\textit{enseignement supérieur}).

Completion of primary education leads to entry into either academic education (\textit{enseignement général}), agricultural education (\textit{agricole}), or terminal practical training (\textit{enseignement pratique terminal}). The first two years after primary school are transitional classes (\textit{classes de transition}) which allow for re-assessment of abilities and aptitudes and transfer to another type of lower secondary education, in the latter two years of which the student's course is already determined. The terminal student attends one year of upper secondary education, the final year of compulsory education, with pre-training in commerce, industry, or agriculture (\textit{éducation générale et professionnelle}); at the conclusion of his studies, he sits for the compulsory school leaving certificate (\textit{diplôme de fin d'études}). The agricultural student

may enter a one-, two-, or three-year program of upper secondary education; the first two are terminal courses (agricole-enseignement court) for which agricultural certificates are awarded (brevet d'enseignement agricole or brevet d'apprentissage agricole for agricole 1, and brevet professionnel agricole or agent technique agricole for agricole 2), and the third leads to an agricultural certificate (technicien agricole) which permits entry into higher education.

The academic student has a number of options for upper secondary education. He may enter one of three two-year terminal courses (enseignement court): a general course with a vocational bias (général), a special vocational course with a technical bias (technique 1), or a special vocational course (technique 2); these lead to school-leaving certificates or diplomas—brevet d'études, brevet d'agent technique, or certificat d'aptitude professionnelle, respectively. The student may enter one of five three-year courses: the first three years of the five-year primary school teacher training institution (école normale primaire), or one of the four courses of complete upper secondary education (enseignement long). These are (1) academic sections with emphasis on (a) Greek, Latin, and a modern language, (b) Latin and two modern languages, (c) Latin, science, and a modern language, (d) science and two modern languages, or (e) biology, science, and a modern language; (2) technical sections with emphasis on science, a modern language, and industrial techniques (technique 1); (3) technical sections with emphasis on two modern languages and general economic studies (technique 2); and (4) the same agricultural program as for the agricole student. The students in the primary normal schools, in academic sections (classique et moderne), and
in technique 1 are required to sit for the school-leaving examination (examen probatoire) after the second year; this serves to prepare them for the baccalauréat, the secondary school leaving certificate taken at the end of the third year, which is required for entrance into higher education. The brevet de technicien, awarded after the third year to technique 2 students, and the technicien agricole, awarded to three-year agricultural students, both permit entry into higher education.

Attached to certain secondary schools are classes préparatoires aux grandes écoles, an extra year or two of study for students preparing for the competitive examination for the grandes écoles, the specialized institutions of higher education which provide training in branches of administration, commerce, industry and agriculture in one- to four-year courses of study, or for the écoles normales supérieures, the higher training institutes for secondary school teachers. There are also one-year preparatory courses (cours préparatoire ou année préparatoire) which prepare for entrance into secondary teacher training institutes (instituts préparatoires à l'enseignement du second cycle), into faculties of letters and human sciences (lettres et sciences humaines), into faculties of science (science et technique), into faculties of law and economics (droit et sciences économiques), and into medicine.93

It would appear from the above that the educational system of France is somewhat more oriented toward technical and vocational education than is that of England, without neglecting the traditional classical type of education. As noted previously, England is moving toward

93 World Survey of Education, op. cit., pp. 466-467. Also, personal interview with Daniel Hérault of Sorbonne University, at the Ohio State University, December 7, 1964.
other types of secondary educational structures. As will be seen, the educational systems of independent African nations are also moving toward an emphasis on vocational and technical education.

**Scientific and Technical Education**

The Phelps-Stokes Reports of the early 1920's, in dealing with the relationship of reading, writing, and arithmetic to community life, sought to involve also the study of history, geography, music, and drawing in the health, agriculture, industry, home life, and recreations of the community; nowhere was science deemed of importance. Yet, in reporting the desire of Africans to learn a European language, the Commission gave as one of the reasons that "it will not be long before they want to know such great physical sciences as chemistry and biology." Evidently, despite its foresight, the Commission did not feel that the study of science had contemporary importance. Instead, the Commission recommended that training be given in trades and handcrafts, in agricultural education, and in health and hygiene.

As late as 1953, the primary school curriculum of Tanganyika included no science, except for an introduction to nature study and hygiene (as part of what was called "general knowledge") in the third and fourth grades; there was also a provision for farming and/or handwork in all four grades of the primary school. Similarly, in Uganda both

---

94 Phelps-Stokes Reports, etc., op. cit., pp. 57-62.
95 Ibid., p. 64.
96 Ibid., pp. 66ff, 157, and 161.
health education and nature study were required for all six grades of the primary school, with agriculture added to nature study, and handiwork for boys and needle work for girls required in the upper four grades. This was the extent of science taught in the primary schools of Africa; there was no provision for the teaching of general science of the kind known in elementary schools in the United States. Upon closer examination of systems of education in other parts of Africa, it will be seen that they provided no greater opportunities for contact with science in the primary schools than did the schools of Tanganyika and Uganda. The in-depth studies of the educational systems of Nigeria, Cameroon, and Sudan will corroborate this contention.

While it considered the elementary school to be the source of education for the masses, the Phelps-Stokes Commission saw the secondary school as the institution whose function was to provide training for almost every type of leader required in Africa. As part of this training, the instruction of the pupils in the elements of physics, chemistry, and biology was considered to be most vital. Even at this early date, the importance of interpretation and application of facts, phenomena, and principles was stressed, with emphasis on local phenomena and on the acquisition of skill in the manipulation of apparatus. Over forty years later, science educators deplore the fact that secondary science curricula seem to be influenced more by the need for passing school leaving examinations than by the recommendations of the Phelps-Stokes

---


99 Phelps-Stokes Reports, etc., op. cit., pp. 150-151.
Commissions. Even so, recognizing the function of the secondary school as a feeder for the university, and also taking into account the fact that most secondary school students plan to enter the university—and that these students constitute the academic elite of their respective countries—the presence of scientific subjects in the secondary school curriculum assumes a position of great importance in the educational, social, economic, and political progress of African nations. Concomitant with such progress is the expansion of technological and industrial facilities, which implies in turn the expansion of educational facilities for training personnel. Here again, the Phelps-Stokes Commissions were not remiss; they stressed the importance of mathematics and mechanical arts in the curriculum. In recognition of the importance of agriculture in Africa, the Commissions also recommended the placement of gardening and rural economics in the secondary curriculum.\(^{100}\)

Thus, science was part of the secondary school curriculum, in varying degree. In those school systems which had a middle or junior high school, general science was often, but not always a part of the curriculum. In Uganda, for example, two years of general science, three periods per week, were offered.\(^{101}\) On the other hand, in Sudan there was little or no general science offered in the middle school; this is a problem which will be discussed in a later chapter.

At the upper level of secondary education, the sciences are offered as the separate subjects of biology, chemistry, and physics in each of the four years. These courses are offered at all secondary schools in

\(^{100}\)Ibid., pp. 152-154.

\(^{101}\)Scanlon, op. cit., p. 41.
Africa; in conjunction with the sciences, virtually all schools have laboratory facilities in varying degree. 102

Technical and vocational training takes place in all countries of Africa. Students enter these schools after primary school, middle school, or secondary school, depending upon the level of competence at which they will operate in their adult careers. Depending upon the country, there may be schools at various levels which feed into the next higher level, providing more advanced skills and producing technicians and managers at various levels. The skills taught may be in such fields as masonry and tiling, ocean fishing, mechanics, manual trades, carpentry, plumbing, electricity, typing, stenography, business administration and so on. 103

The need for scientists and technicians at all levels is so great that vocational guidance from the primary school through the university is emerging as an important factor; the role of vocational guidance was a topic of discussion at the Lagos Conference. 104 Another important factor is that of articulation of scientific studies, particularly between the secondary school and the university. 105 A third

---


103 Ibid.


important factor in African education as a whole is the role of the ex-
aminations system; this will be described and discussed in the separate
chapters on Sudan, Cameroon, and Nigeria.

Teacher Education

At every level of education there is a severe shortage of Afri-
can teachers. At the primary level, rapid expansion has made it neces-
sary to employ teachers who are sub-standard; many of these have little
or no secondary education or professional preparation. The shortage
in secondary schools, particularly in languages, sciences, mathematics
and in technical, vocational, and agricultural education, has forced the
schools to rely on expatriate teachers.

In general, the status of the teaching profession in Africa is
low. Salaries are low, and the working conditions are not such as to
encourage good students to enter the profession. Because of the low
status and prestige, many trained teachers leave for higher-paying jobs;
also, fewer qualified candidates come forward for teacher training. The
massive expansion of educational facilities in recent years has created
a shortage of teacher training institutions and college staff, thereby
compounding the problem. To meet this problem, the independent na-
tions, often with the assistance of foreign technical programs, are

106 Bigelow, op. cit., p. 66.
107 Busia, Purposeful Education for Africa, p. 62.
108 Survey of the Status of the Teaching Profession in Africa
(Washington: World Confederation of Organizations of the Teaching Pro-
109 Busia, op. cit., p. 61.
expanding training facilities and increasing the supply of native teachers.  

Long before the African nations achieved independence, main criteria for the training of teachers in these (and other) areas were recorded by the United Nations Committee on Information from Non-Self-Governing Territories at its 1950 session, as follows:

(a) The development of the technically and socially conscious teacher is essential to the educational advancement of the Non-Self-Governing Territories.

(b) Teacher-training institutions should be of high quality and directed by those having deep sympathy with and knowledge of indigenous life.

(c) Such training institutions should have a wider aim than the mere inculcation of routines of instructional methods; they should endeavor to produce teachers with a basic knowledge of the purpose of their teaching.

(d) Teacher-training institutions should therefore be in close and fruitful contact with the general life of the communities, with other institutions of higher education and with practising teachers.

(e) Even so, the teaching profession cannot attract candidates of the type required unless more attention is given to the needs of the profession, in terms of the conditions of service and of the place given to its members in public life.  

With regard to the last item, it appears that, even in the United States, with its relatively high educational development, recommendations are made regarding the increased recognition of the importance of the professional role of teachers in order that they should be enabled to improve the effectiveness of their instruction.  

110 For example, see the report of the Syndicat National des Enseignants Publics de Côte-d'Ivoire, "Ivory Coast," Education Panorama, VII, No. 3 (1966), p. 22.  


high-minded aims set forth in the above-quoted criteria, the fact is that the teaching profession in Africa includes people who engage in the occupation for a variety of reasons, as follows:

1. Those who are convinced that teaching is their calling and that they can best serve their country in that capacity.
2. Those who choose teaching and find satisfaction in it as compared with other occupations.
3. Those who cannot make good elsewhere, but because they have the minimum academic qualification required join the profession from necessity rather than from choice.
4. Those who have had secondary education, but have been disqualified for further higher studies because of poor academic record.
5. Those who have not been to secondary schools because of their inability to pass the entrance examinations, or because of lack of opportunity to do so in the past.¹¹³

Systems of Teacher Education

The goal of primary teacher education in the pre-independence period was to provide full secondary education followed by one or two years of professional training. Although this was sometimes achieved, more often than not the level of scholastic achievement before entering into teaching was considerably less. In French West Africa, for instance, although the preferred program consisted of four years of secondary school followed by four years in the écoles normales, roughly equivalent to the fourteen-year program for preparation of primary school teachers in France, more often the teacher had six years of primary education followed by four years in the cours normaux.¹¹⁴ Today, the fully-qualified teacher (instituteur) may teach the two top classes

¹¹³ Survey of the Status, etc., op. cit., p. 3.
¹¹⁴ Progress of the Non-Self-Governing Territories, etc., op. cit., pp. 4-5.
of the primary school or the lower classes in the *cours normaux* or *cours complémentaires*; the lesser-qualified teacher (*instituteur-adjoint*) usually teaches the middle two classes of the primary school. There is a third group of sub-standard teachers, called *moniteurs*, who either come from the primary schools or have not passed their examinations for the B.E.P.C.; these undergo one year of training and then may teach the first two years of primary school.\(^{115}\)

In English-speaking countries, primary teacher education followed an inconsistent pattern, ranging from one year of professional education after six years of primary education to four-to-six years of secondary education followed by two years of professional education. The relative consistency of the French pattern made it possible for a teacher to teach at an equivalent level in any French colony; this was not quite true in the British colonies. The trend in English-speaking Africa is toward upgrading of admission requirements toward ten years of schooling, with the School Certificate as prerequisite for entrance into a four-year professional program; this is now required in the preparation of primary school teachers in the Sudan.\(^{116}\)

Secondary school teachers in Africa are, for the most part, expatriate university graduates, although there are some natives who have graduated from foreign universities who have returned to teach in secondary schools.\(^{117}\) Attracting teachers for secondary education is a

\(^{115}\) *Survey of the Status, etc.*, op. cit., pp. 4-5.

\(^{116}\) *Ibid.*, pp. 5-6. Also *Progress of the Non-Self-Governing Territories, etc.*, loc. cit.

\(^{117}\) *Survey of the Status, etc.*, op. cit., passim.
considerable problem, inasmuch as the expatriates are needed in the bur­
geoning schools of their own countries, and the natives can find posi-
tions with greater remuneration in government and industry.  

The prospects available to a student with a science background 
are leading to an increase in the number of students availing themselves 
of science options in secondary school, thereby increasing the number of 
science teachers needed. The difficulty in recruiting science teachers 
is compounded by the fact that African governments have not succeeded in 
making the conditions of employment sufficiently attractive to secure 
the services of qualified personnel who seek better-paying posts in in-
dustry.  

Purposes and Progress in Teacher Education

In January 1966, educational experts from twenty-nine countries 
met in Geneva under the auspices of UNESCO and the International Labour 
Organization and unanimously endorsed an international Draft Recommenda-
tion on the Status of Teachers aimed at improving the professional, so-
cial, and economic condition of teachers. Part of the recommendation 
dealt with preparation for the profession; it stated that "the purpose 
of a teacher preparation programme should be to develop in each student 
his general education and personal culture, his ability to teach others, 
an awareness of the principles which underlie good human relations, 
within and across national boundaries, and a sense of responsibility to 

118 Progress of the Non-Self-Governing Territories, etc., loc.
cit.

119 Cessac, op. cit., p. 61.
contribute both by teaching and by example to social, cultural, and economic progress." The Recommendation went on to state that a teacher preparation program should include:

(a) general studies;
(b) study of the philosophy, psychology, sociology, theory and history of education, comparative education, school administration and methods teaching the various subjects;
(c) studies related to the student's intended field of teaching;
(d) practice in teaching and in conducting extra-curricular activities under the guidance of fully qualified teachers.

UNESCO has assisted in providing staff for the training of teaching staff for primary teacher training institutions; Makerere College in Uganda has held such courses since 1961 for English-speaking trainees and the Centre at Bangui, Central African Republic has provided similar courses for French-speaking trainees since 1962. In addition, three new Special Fund-assisted projects for the training of secondary school teachers were to have become operational in 1965 in Ethiopia, Sierra Leone, and Tanzania.

The Meeting of Experts on the Teaching of Science in Tropical Africa which met in Abidjan, Ivory Coast in December 1960 noted the following with respect to secondary science teachers: (1) that there is a serious shortage of qualified and trained science teachers; (2) that there is a need for training an increasingly large number of young African teachers; (3) that accelerated training methods must be employed;

---


121 Ibid., pp. 3-4.

(4) that teachers should be trained at local teacher training colleges and universities preferably, or at institutions in a neighboring country, or, as a last resort, at institutions outside of Africa; (5) that teachers should receive a fairly general training that will permit them to teach two or three of the sciences; and (6) that African universities should be created in numbers sufficient to cope with the need for training science teachers. 123

The Seminar on the Teaching of Basic Sciences in African Universities, which met in December 1962, recommended (1) that the university training of secondary science teachers be so orientated that a full appreciation of the impact of science and technology on social change would be consciously included; (2) that four years of academic studies be set as a minimum requirement; (3) that all types of institutions which might contribute toward science teacher training—such as teacher training colleges, pedagogical institutes, and university faculties of education—should be taken into account; and (4) that schemes should be introduced for the continued training of science teachers. 124

Certification Examinations

In Africa, completion of each level of education requires sitting for the appropriate examination. This practice stems directly from the usage in the educational systems of the European nations on which the respective African nations have structured their own systems. Thus, the English- and French-speaking nations, for the most part, rely on the same

---

123 Cessac, op. cit., p. 64.
124 The Teaching of Sciences, etc., op. cit., p. 29.
examinations as are conducted in Britain and France, with the exception that some of the nations now employ national or regional examinations which are comparable to those of Britain or France. In the discussions of the educational systems of Nigeria, Cameroon, and Sudan, their examinations systems will be covered in some detail; what follows is a broad, general description of the examinations systems followed in most African nations of British or French heritage.

British-type Examinations Systems

Of the nine examining systems in England and Wales which offer a General Certificate of Education (G.C.E.), two—the University of Cambridge Local Examination Syndicate and the School Examinations Department of the University of London—operate most extensively in Africa. The Cambridge Syndicate, which offers its examinations only through schools, gives the Joint Examination for the School Certificate and the G.C.E., Ordinary (or O) Level at the close of Fifth Form in England and West Africa and at the end of Fourth Form in East Africa. The Syndicate offers the Joint Examination for the Higher School Certificate and the G.C.E., Advanced (or A) Level at the end of Sixth Form. The University of London, which deals primarily with private candidates, offers only the G.C.E. examinations.125

The Joint Examination contains seven subject areas, as follows: I. English Language, II. General Subjects, III. Languages, IV. Mathematical Subjects, V. Science Subjects, VI. Arts and Crafts, and VII. Technical and Commercial Subjects. (The science subjects include General

125 Sasnett and Sepmeyer, op. cit., pp. 1465-1466.
Science, Additional General Science, Agricultural Science, Physics, Chemistry, Biology, Physics with Chemistry, and Botany). Each candidate must sit for six, seven, or eight subjects, including English Language and other subjects chosen from at least three of the other groups. 126

The Joint Examination for the Higher School Certificate and the G.C.E., A Level contains principal subjects, as follows: English, Bible Knowledge, History, Geography, Economic and Public Affairs, Latin, Greek, French, Spanish, Mathematics, Pure Mathematics, Applied Mathematics, Physics, Chemistry, Biology, Botany, Zoology, Art, Music, Woodwork, Metalwork, and Geology; the Examination also contains subsidiary subjects, as follows: English, Ancient History, Latin, Greek, French, Spanish, Mathematics, Physics, Chemistry, Biology, Botany, Geology, and Music. Each candidate must sit for a General Paper and (a) at least three principal subjects or (b) at least two principal subjects and two subsidiary subjects. 127

The University of London G.C.E. examinations are administered in overseas centers to individuals who are qualified to sit for them; the prerequisites vary considerably from country to country. The offerings are considerably broader than those of the Cambridge Syndicate, especially in languages.

The West African Examinations Council

Since 1954, examinations for pupils leaving grammar schools in British West Africa have been conducted by the West African Examinations Council, a public body with its headquarters in Accra, Ghana, in which

126 Ibid., p. 1406. 127 Ibid., p. 1411.
universities, schools, and educational administrative groups in Gambia, Ghana, Nigeria, and Sierra Leone are represented. The W.A.E.C. represents an important step in the efforts of Africa to reduce some of the effects of western influences and to re-Africanize the cultural outlook.

In 1949, G. B. Jeffery, director of the Institute of Education of the University of London, was invited by the Secretary of State for the Colonies to study the proposal to institute a W.A.E.C. As a result of his recommendation, and over the objections of some Africans who preferred the prestige of the Cambridge examinations, the W.A.E.C. was established in 1951. Although he had been directed to study the problem of secondary school examinations, Jeffery recommended that the Council be given wide powers to conduct a wide range of such examinations as might be considered to be in the public interest.

In line with Jeffery's recommendation, the Council now conducts examinations for other public bodies besides the schools. Among the professional organizations which make their examinations available in Africa through the Council are those of accountants, statisticians, secretaries, bookkeepers, civil engineers, and surveyors. The Council also gives a Middle School Leaving Examination, Entrance Examinations to Secondary School and Teacher Training Colleges, Final Examinations for Teacher Training Colleges, the G.C.E. Examination of the University of London, University of Ghana Entrance Examinations for Nigerians, as well as Civil Service examinations and examinations of the City and Guilds.


It is at the secondary level that the greatest degree of uniformity obtains and undoubtedly a major influence towards uniformity has been the West African Examinations Council. This body enables Nigerians to attempt a full range of examinations including the external examinations of London University. At the secondary level it offers School Certificate examinations equivalent with those of the Cambridge Syndicate. The Ghana School Certificate is set and marked entirely in West Africa. The West African School Certificate is set in West Africa, marked in England, and moderated in Africa. The fact that all secondary schools in Gambia, Sierra Leone, Ghana and Nigeria use one or another of these examinations as its first objective has had a powerful and on the whole a beneficial effect on secondary education in West Africa and it has assured that, within Nigeria, there is uniformity of standards and aims amongst the secondary schools of the Federation.\(^{131}\)

In 1960, the Council established its own School Leaving Certificate examination for fifth form pupils in Ghana and Sierra Leone; pupils in Gambia and Nigeria now take this examination also. In 1964, the Council took over responsibility for the West African School Certificate awarded to successful Sixth Form examinees in Nigeria; this certificate replaced the West African School Certificate of the University of Cambridge.\(^{132}\) This has had two interesting results in Nigeria. The first is that Sixth Form work is developing very rapidly in Nigeria, and much more rapidly than elsewhere in West Africa. The second is that there is an increase in concentration on science teaching in the Sixth Forms, as reflected by the number of candidates entering for science subjects.\(^{133}\)

\(^{130}\)Ibid.


\(^{132}\)West African Examinations Council, "op. cit., pp. 4-5.

\(^{133}\)Alexander, op. cit., p. 11.
Other Examining Bodies

Besides the W.A.E.C., two other examining bodies are worthy of mention. The Sudan Examinations Council (which will be discussed in greater detail in a later chapter) now administers its own examination for the Sudan School Certificate instead of the Cambridge School Certificate or the G.C.E. In Ethiopia, secondary school graduates now sit for the Ethiopian School Leaving Certificate instead of the G.C.E. of the University of London.  

French-type Examinations Systems

Of the African nations formerly under French control, only Algeria, Guinea, Mali, Morocco, and Tunisia have created their own secondary school leaving examinations; these baccalauréats have been patterned after that of France, but have been adapted to the particular needs of the respective country. All other nations maintain complete liaison with the educational system of France, including its baccalauréat; these countries include Cameroon, the Central African Republic, Chad, Congo (Brazzaville), Dahomey, Gabon, Ivory Coast, the Malagasy Republic, Mauritania, Niger, Senegal, Togo, and Upper Volta. This discussion, therefore, will be most fruitful if it is limited to a consideration of the French baccalauréat.

As noted in the earlier discussion of the French educational system, the school leaving examination is presented in two parts: the

---

124 Sasnett and Sepmeyer, op. cit., p. 1466.

125 Ibid., p. 1479.
examen probatoire after the second year of upper secondary education, and the baccalauréat after the third year. However, starting in 1968, the baccalauréat will be a single examination at the close of secondary education; the examination will be drawn up locally, rather than nationally, as has been the practice. Nevertheless, the probability is that African nations will retain the examen probatoire or a similar examination.

Candidates for the examen probatoire choose from one of eight groups of tests: série classique A, série classique A', série classique B, série classique C, série moderne M, série moderne M', série technique T, or série technique T'. The tests in each group are as follows:
- French essay (all, except French composition in T'), Latin translation (all classique), Greek translation (A, A'), mathematics and/or physical sciences (all), history or geography (all), modern foreign language (all), second modern foreign language (B, M, T'), oral test in modern foreign language (B, M, M', T'), physical education (all), mechanical construction (T), statistical mathematics or problems of economic order (T'), and technology of merchandising (optional instead of physical sciences in T').

Besides these tests, which are compulsory, (épreuves obligatoires), the examination includes one or two optional tests (épreuves facultatives), as follows: (1) drawing, musical education, or home economics, and (2) oral test in a modern foreign language not chosen for the compulsory test. Despite the fact that these groups appear to be similar in construction, actually they differ by virtue of a system of weighting, or coefficients; depending upon the série, each test

---

136 Ibid., p. 1450.
carries a given weight according to the "major" of the student.\textsuperscript{137}

Candidates for the baccaulauréat choose from one of five groups: série philosophie, série sciences experimentales, série mathématiques élémentaires, série mathématiques et technique, or série technique et économie. The compulsory tests in the first three series include philosophy, mathematics, physical sciences, natural sciences, history or geography, modern foreign language, and physical education; mathématiques et technique includes a test in either philosophy, history or geography, mathematics, physical sciences, modern foreign language, mechanical construction, a practical technical test, and physical education; technique et économie includes philosophy, mathematics, history or geography, modern foreign language, economics, an oral test in a second foreign language, and physical education. As with the examen probatoire, the tests are weighted according to the group. Also, the optional tests are the same as for the examen probatoire.\textsuperscript{138}

As will be noted in the discussion of the educational system of Cameroon, the examinations are sent from Bordeaux and are returned there for grading by the respective African nations which are still using the French examinations.

Problems and Needs in African Education

In the pre-independence period when the colonial powers began to assume greater responsibilities for the development of education in their colonies and territories, much progress in primary education was made toward (1) the provision of universal free education, (2) school

\textsuperscript{137} Ibid., pp. 1450-1454.  \textsuperscript{138} Ibid., pp. 1451 and 1454-1455.
building programs, (3) the provision of equipment and teaching material, (4) teacher training programs, (5) administrative efficiency, (6) education of girls, and (7) re-organization of curricula. However, as this progress was being made, it created new problems, among them (1) the provision of adequate finance for capital development, (2) the difficulty of maintaining adequate standards during a period of rapid expansion, (3) the need for increasing numbers of trained teachers, and (4) the uneven spread of educational development within individual territories, because of geographical and/or historical factors. These problems were in turn compounded by the pressure of rising populations with increased desires for further education. 139

At the secondary level, the major problem was financial, due in part to the high cost of constructing school buildings with the laboratories and libraries needed for secondary education, and in part to the necessity of providing boarding establishments for students who came from a distance. The shortage of teachers, particularly women teachers and teachers of science, in turn created a need for expansion of higher education. A third problem was related to factors determining local curricula at the primary level; these were quite different from the curricula at the secondary level, which were influenced by the need to prepare students for university entrance. This resulted in poor preparation for the secondary school, particularly the academic schools. Needs for future developments were seen to be as follows:

(a) In educational planning and the allocation of finance, expansion of secondary education had to be integrated with

139 Progress of the Non-Self-Governing Territories, etc., op. cit., p. 50.
the raising of standards in primary schools, with the training of secondary-school teachers and with the needs of institutions of higher education.

(b) In the financing of secondary education, still wider provision of boarding facilities and of free places are needed, so that no child with ability need to be debarred from schooling by geographical or economic circumstances.

(c) In the curriculum, further adaptation to the social background of the students will undoubtedly take place. This also entails recognition of the value of a more broadly based secondary course, embracing the "modern" school and vocational studies as well as studies preparatory to higher education.140

Although there was expansion of technical and vocational education in the pre-independence period, it was to a lesser degree than in other types of education. Among the problems facing this type of education were (1) the tendency of the best pupils to remain in general academic education, thus leaving poorer students to enter technical education, (2) a prejudice against manual work, (3) financial difficulties due to the high costs of building, equipment, and maintenance, (4) shortage of qualified staff, (5) language difficulties, and (6) wastage of pupils, due to poaching by industry. Among the needs related to the future development of technical and vocational education, the following were seen to be worthy of attention: (1) the need for legislation to protect apprentices, (2) the need for closer appraisal of present and future needs of industry, (3) the need for continuing and strengthening the link between industry and education departments in framing and conducting vocational education, (4) the provision of more part-time education facilities to suit the needs of in-service training schemes, (5) the need for vocational guidance services, (6) the provision of general education during vocational training, and (7) greater attention to the vocational needs

140 Ibid., p. 65.
of women.

In teacher education, some of the problems were seen to be as follows: (1) finding a supply of recruits to fulfill expanding needs and as replacements, (2) devising a pattern of organization for teacher training institutions, (3) finding a curricular balance between general and professional subject matter, (4) preparing a sufficient number of women teachers to overcome the low supply of recruits and the attrition due to marriage, and (5) making teaching attractive enough to overcome losses to industry and government. Among the main points to consider in determining future policy with regard to teacher education are the following: (1) efforts to raise the level of training courses for primary teachers to the equivalent of full secondary education, (2) overcoming the shortage of women teachers, (3) emphasizing in-service training, and (4) increasing recognition of the importance of teachers' unions.

In higher education, some of the difficulties encountered were (1) high financial costs for capital outlay and for current expenditure when enrollments were low, (2) the need for establishing internationally acceptable standards, (3) recruitment of staff, and (4) the improvement of the quality and quantity of secondary school leavers. Trends to be considered with a view toward future growth were (1) the breaking down of barriers of race and religion and the fusion of separate systems of education, (2) the expansion of the range of institutions and studies, particularly with regard to technology and agriculture, and (3) the increased use of extension work, such as part-time classes, summer

---

141 Ibid., p. 76.  
142 Ibid., p. 88.  
143 Ibid., p. 94.
courses, and adult education services. 144

In the 1950's, the decade preceding the general trend toward independence in Africa, education and educational systems expanded at a tremendous rate. With this expansion came an increase in problems, especially in some particulars. The population increased at an average annual rate of slightly under 3%, to a total of approximately 155 million by mid-1959. However, the school population in 32 countries increased in the period 1953-54 to 1957-58 from 5,642,000 to 9,205,000, or an increase from 4.3% to 6.4% of the total population. Of this increase, enrollment in primary schools went up from 5,300,000 to 8,700,000, and from 303,000 to 521,000 in secondary schools, representing increases over the four-year period of 63% and 72% respectively. Of the school population in 1957, 94% were in primary schools, 6% in secondary schools, and 0.1% in higher education. The numbers in higher education represented a ration of 5 students per 100,000 total population, compared with a world average of 385. Of the numbers in primary schools in these countries, about one-third were girls; in the secondary schools, about one-fifth were girls. 145

Because of the teacher shortage at all levels, the pupil-teacher ratio was often quite high, varying from a low of 20 in Italian Somaliland to a high of 63 in the Malagasy Republic in primary schools, and from a low of 9 in British Somaliland and Ruanda-Urundi to a high of 57 in the Central African Republic in secondary schools, with an approximate

144 Ibid., p. 83.
average for the 32 countries of 34 in the primary schools and 24 in the secondary schools. (In the primary and secondary schools of the three countries under particular study, the pupil-teacher ratios were 50 and 15 in Cameroon, 29 and 19 in Nigeria, and 40 and 29 in Sudan.)

Of the 32 countries, only 13 had facilities for higher education. A study of ten of these showed that there were about 8000 students enrolled in 1958-59, as follows: 20% in humanities, 20% in natural sciences, 14% in social sciences, 12% in law, 11% in education, 8% in medicine, 7% in engineering, 4% in agriculture, and 4% in fine arts. About 15% of these students were women. The emphasis in English-speaking countries seemed to be on studies in education, while the emphasis in French-speaking countries was on law and social sciences. (In Nigeria, 30% were studying the natural sciences, 7% engineering, and 1% agriculture.)

Contemporary Educational Problems and Needs

Although African education needs improvement at every level, at least one writer sees the greatest need at the secondary level. Bigelow avers that secondary education is the producer of middle-level manpower of all kinds. It also provides the training ground for primary teachers and the prerequisite education for higher studies. Bigelow further urges the development of comprehensive secondary schools, rather than individual academic, technical, and teacher training institutions, both on grounds of economy and to avoid separatistic loyalties which division of educational facilities might encourage.

\[146\text{Ibid.}, \text{pp. 39-40.}\]
\[147\text{Ibid.}, \text{pp. 41-42.}\]
\[148\text{Bigelow, op. cit., pp. 48-49.}\]
\[149\text{Ibid., p. 65.}\]
A related problem is the shortage of classes which prepare for the university—Sixth Forms in British-type education and Terminale in French-type. For example, in 1960, the total number of Sixth Forms in six British territories numbered less than ten. As shall be seen later, this problem has been one of the first to be attacked in recent years.

Harbison places the ratio of middle-level to high-level personnel needed at three-to-one; in both categories, teachers constitute by far the largest requirement. The universities seem to be supplying an adequate number of graduate teachers, while the secondary schools have so far not been able to produce lower-level teachers in the numbers needed; like Bigelow, Harbison sees the priority in educational expansion given to secondary education. Also, "with respect to teachers, the greatest demand now and for years to come will be for persons competent to instruct in mathematics, agricultural science, general science, and technical subjects related to engineering. This means that technical subjects must be given the highest priority in teacher education." So great is this need, that, very often, the services most desired of teachers and educators from foreign countries (including the United States) are actual teaching of elementary or secondary school science classes.

150 Hunter, op. cit., p. 245.


However, the major function of these visiting educators is to provide professional leadership in creating schools responsive to the needs of Africa. Complete Africanization of the schools can only come about when the schools are totally manned by Africans. Further, there is need to Africanize the curriculum. "Access to the world of learning, in science as well as in the arts, is long established. Now indeed there is time and necessity for greater selectivity, for an education better suited to agricultural countries and to the social tasks of Africa." This is part of the "natural ambition of African governments to Africanize the principal cadres of three main sectors—the Civil Service, the professions and industry." Expatriate school and university teachers are welcome, provided they come under African jurisdiction.

Opportunity for Education

In its 1965 Theme Inquiry, Equal Opportunity Through Education, the World Confederation of Organizations of the Teaching Profession, in the Inquiry Outline presented to the Assembly Delegates, stated that "there appear to be four major factors which influence equality of opportunity: (1) availability of educational services; (2) limitations due to social and economic background; (3) limitations arising from physical conditions: health, race, sex; and (4) relationship between education provided and the individual's aptitudes and environment."

153 Bigelow, op. cit., p. 71.
Availability of educational services relates to the policy of the government and its ability to provide free education, with suitable facilities and teachers. This has been discussed earlier in this chapter and will be covered further in later chapters.

Limitations of social and economic background refer to such factors as the necessity to provide income for the family at whatever age, the ethnic or cultural background in terms of language or religion, and geographical location in terms of availability of education. Three such factors pertinent to this study are parental objection, nomadism, and the Moslem religion.

Even though primary education may be free, many parents do not send their children to school. Often, the children are needed on the farm in order to augment the family income. Sometimes, religious or tribal tradition acts as a conservative force militating against education for youngsters. An interesting example of tribal influence was stated by one interviewee:

First of all, traditionally in our place, you were brought up—you grow up and learn your father's trade; you learn to help him on the farm. One of your traditional duties was to go and bring your father's wine from a distant area, especially if your father was a local head. Because, under the feudal system of government, you have the chief who is the head of the district, and under him you have the sub-chiefs, and under the sub-chiefs you have the village heads, and under the village heads you have the family heads, and so, there is division of authority right down the line. All these fellows usually have a bunch of kids around them who have various duties. It was considered an honor for one of these boys to be selected as one of the staff of the fon's part—the fon is the name of the chief, you see; that is his official title. So these boys—they didn't want to go to school. Their parents would object to their going to school, because they lose title; they don't have the respect they would have if their
children could do these duties. So, whenever we went to campaign to get school children, this was a traditional complaint.156

In some of the vast desert areas, and among nomads in particular, introducing education is particularly difficult. This is a problem in such countries as Sudan, Cameroon, Chad, Somalia, and other Saharan countries, as well as in areas which border other deserts of Africa. Not only do governments have difficulty in persuading nomads that education may have some value for them, but it is usually highly uneconomical even to have schools in such areas.

The widespread objection of Moslems to secular education is another factor which contributes to poor school attendance. Attendance at mission schools has been particularly poor in Moslem areas. Such education as takes place in the Islamic world is traditionally religion-oriented, and those children who do go to school attend Koranic schools. Also, the traditional status of women in Islam is such that very few girls attend school; the percentage of female attendance is much lower than in non-Moslem areas. Whatever the reasons for poor school attendance, the percentage of school-age children who actually attend school is much lower in Moslem-dominated countries.

Limitations arising from physical condition include such factors as the health of school-age children and their sex. The status of women everywhere in the world tends to place them in an inferior position with regard to education, among other things. Thus, everywhere in Africa, female school attendance at all levels is much less than is male attendance. This is true in non-Moslem countries, although not to the extent

156 Personal interview with Omar Sendze of the Federal Republic of Cameroon, at the Ohio State University, August 23, 1964.
found in Moslem countries.

Although health education and hygiene are taught in most primary schools, it may be that the school or other local agency does not provide facilities and services which cater to the health of the individual child. Nor, in most cases, is there any provision for special education for the physically or mentally handicapped.

A third factor which applies in some areas to prevent an equal opportunity for education is racial discrimination. This may operate in actual overt discrimination, as in the apartheid of South Africa, or in preferential treatment of students from particular tribes.

The relationship between education provided and the individual's aptitudes and environment do indeed create some stressful problems in many areas. The problems are two-edged: either facilities are lacking, or education at a particular level is too productive to have its products readily absorbed by the economy. In the first case, the problem is most severe at the secondary level; primary school graduates clamor for further education for which they have the qualifications, but there are all too few schools to accommodate them. In the second case, graduates at all levels of education find that there are all too few positions available to them commensurate with their training and abilities; often, this leads to juvenile or adult delinquency or, in the case of upper-level talent to a "brain-drain."

The Elite and the Brain-Drain

"The elite who dominate the national politics of most non-Western countries generally represent a remarkably homogeneous group in
terms of educational experience and social background. It is those who have become urbanized, have received the appropriate forms of education, and have demonstrated skill in establishing the necessary personal relationships who are admitted to the ranks of the elite."\(^{157}\) Unfortunately, the same society which produces this elite fails to produce a quantity of skilled personnel—such as doctors, engineers, and teachers—in numbers sufficient to enable that society to cope with more modern forms of social, economic, and political life.\(^{158}\)

Education in the newly independent nations has taken on a distinctly patriotic and nationalistic tone. Departing from the colonial educational policies, concentration is being placed on the education of the masses without, however, losing sight of the need for an elite. In Guinea, for instance, the type of educated elite which is emerging in the 1960's is quite different from the typical product of the colonial period. According to DuBois:

The new elite: (1) shows a conspicuous lessening of the orientation toward French civilization and culture; (2) shows an intensive commitment to the political systems under which it lives; (3) is far more inclined to diversify its skills and professions than were earlier elite groups formed under the French. Thus the traditional proclivity toward a degree in law over one in science or engineering is being altered.\(^{159}\)

As hopeful as the development of this new elite appears to be in terms of its value to its homeland, it appears to be not an unmixed blessing. In some emerging nations, there is severe underemployment of

\(^{157}\text{Pye, op. cit., p. 16.}\) \(^{158}\text{Ibid., p. 48.}\)

professionals. Recently, for instance, jobless engineering graduates of the University of Khartoum in Sudan came close to rioting because there was no engineering work available for them.\textsuperscript{160} When skilled scientific talent has received its training in a foreign country, often it fails to return home in the expectation that employment opportunities are non-existent there. The greatest recipient of this munificent windfall of scientific talent is, of course, the United States. Of approximately 100,000 students who come to American universities every year for advanced training, with the expectation that they will return to their own countries, an estimated 90\% of the Asians, 50\% of those from the Near East, Greece, and Egypt, and large proportions of those from Africa and Latin America never return home.\textsuperscript{161} Yet, the United States is not the only nation to profit from this brain-drain. France, for instance, has received more professors and physicians from Togo than she has sent to her former colony.\textsuperscript{162} Also participating in this brain-drain are other countries of Western Europe and North America.

"African nations are desperately in need of trained manpower who can lead them to the kind of economic development upon which their long-term future depends. The quickest way to get them trained is to bring them here, where educational resources already exist." Yet, must the trained individual go back to his country to provide it with a service which it sorely needs, without the certainty that the service will be used? This poses a problem not only to the emerging nations of Africa,

\begin{itemize}
  \item \textsuperscript{160} Ronald Schiller, "Brains Across the Sea," \textit{Reader's Digest}, XC (March, 1967), p. 75.
  \item \textsuperscript{161} Ibid., p. 73.
  \item \textsuperscript{162} Ibid., p. 74.
\end{itemize}
but to the United States, which must determine whether in all honor to continue to support exchange programs from which it reaps the maximum benefit itself. \(^{163}\) Efforts are being made to reduce the number of foreign students allowed to remain in the United States after training, to build multinational institutions for advanced training in science and technology in emergent areas, to establish American research facilities in these areas, and to take other steps to ensure the return of these students to positions in their own countries. \(^{164}\)

Problems and Needs in Science Education

Recalling the general objectives of science education—scientific literacy, trained personnel, and critical thinking in leadership—let us examine the deficiencies in these areas.

Participants at the 1960 Abidjan meeting of experts in the teaching of science in Africa were unanimously agreed that little had been done in the way of popularization of science, such as is common in industrially-developed nations. For the illiterate public, which is largely unreceptive to the popularization of science, success has been achieved to some extent only in the areas of elementary hygiene and with regard to improved methods of agriculture. For the semi-literate or literate public, which has received varying degrees of formal education, some means of popularizing science, other than through science


\(^{164}\) Schiller, op. cit., p. 76.
instruction in the schools, have been limited to a few museums, exhibitions, libraries, and some communication media. The experts recommended such means as the establishment of museums, zoos, and botanical gardens, the organization of exhibitions, especially with respect to agriculture, the use of radio programs, the expansion of science areas in libraries, the establishment of scientific journals, and the establishment of science clubs, both in and out of schools.  

In science teaching in the schools, whether for purposes of general education or for training of scientists, it is important that the syllabuses be adapted to the needs of the various African countries. This is also true of the textbooks in use in the secondary schools, almost all of which are produced by publishing firms in England, the United States, France, or Belgium, and with very few exceptions, are those in use in those countries.

An UNESCO survey indicates that all over the world, an urgent problem is the creation of new faculties of science, polytechnical institutions, and vocational training centers. There are indications that the African countries are prepared to accept enormous sacrifices in order to achieve and maintain educational progress as a means toward self-development. The recruitment and preliminary and in-service training of science teachers thus becomes a problem of great proportions. The prospects open to an individual with a scientific background are leading many youngsters to go on to secondary school seeking a scientific

165 Cessac, op. cit., pp. 75-78.
166 Ibid., p. 20.
167 Ibid., p. 23.
168 de Gamarra, op. cit., p. 320.
emphasis in their studies; this, in turn, leads to a progressive increase in the numbers of secondary school science teachers needed.\textsuperscript{169} Likewise, the growing demand for technicians is creating a need for technical and vocational training centers, and concomitantly, a need for technical and vocational teachers.\textsuperscript{170}

The Abidjan meeting concluded that "science teaching in any secondary school is quite inadequate unless supported by a supplementary course of laboratory experiments." For African students, especially those with a limiting village background, it was felt that experiment is the best and only way to impart scientific knowledge.\textsuperscript{171} Nevertheless, a survey at the beginning of this decade showed that, in general, laboratory facilities for student experimentation are minimal or non-existent.\textsuperscript{172} In order to comply with the recommendations of the Abidjan experts, it will be necessary for African nations to expand secondary school facilities for student experimentation; this means a considerable expenditure must be made for the construction of laboratories and the acquisition of equipment and supplies.

Articulation between the secondary school and the university has already been mentioned as a problem. It is interesting that, at the Rabat Seminar on the Teaching of Basic Sciences in African Universities in 1962, the delegates evaluated the deficiencies of secondary school science in terms of university entrants; these are the results, in order of rank: (1) insufficient general reading by students entering the

\begin{verbatim}
\textsuperscript{169} Cessac, op. cit., p. 61.
\textsuperscript{170} de Gamarra, op. cit., p. 320.
\textsuperscript{171} Cessac, op. cit., p. 20. \textsuperscript{172} Ibid., pp. 25-36.
\end{verbatim}
university, (2) insufficient practical experience, (3) tendency to remember rather than understand, (4) knowledge confined to the syllabus content, (5) limited practical skills, (6) limited critical ability, (7) knowledge mainly theoretical, (8) insufficient basic mathematics, (9) inability to improvise, and (10) inadequate command of terminology.\textsuperscript{173}

The problems encountered at the university level in teaching science were also evaluated, as follows, in order of rank: (1) insufficient staff to teach science, (2) lack of supporting technicians, (3) lack of special services, (4) too heavy a teaching load, (5) limited budget, (6) shortage of textbooks, (7) shortage of apparatus, (8) shortage of supplies, and (9) inadequate library.\textsuperscript{174} It is interesting to note that some problems and needs are common to both secondary and higher educational levels.

Despite the desire to Africanize the educational systems, the need for foreign teachers at all levels and of all types is all-important to the continued expansion and improvement of African education. The Abidjan meeting cited the need for foreign teachers to learn about their host countries in order better to appreciate local conditions and to weigh their own roles within the local educational systems. Some of the ways in which these teachers could be utilized are as training advisers, as demonstrators of equipment and individual practical work, as master teachers supervising the work of African teachers,\textsuperscript{175} as teachers of science methods, in constructing or revising science syllabuses and courses of study, writing textbooks, speaking at conferences, and:

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{173} The Teaching of Sciences, etc., op. cit., pp. 40-41.
\item \textsuperscript{174} Ibid., p. 40.
\item \textsuperscript{175} Cessac, op. cit., p. 74.
\end{itemize}
\end{footnotesize}
participating in workshops, organizing and conducting science fairs, and working in science teacher education programs.\(^{176}\)

**Summary**

Africa is a huge continent, rich and diverse in terms of its geography, history, culture, races, religions, languages, colonial background, and recent social, political, and economic progress. The educational systems of the various nations owe their formation and structure, for the most part, to the European nations of which they were, or still are, dominions. The early educational systems were established by missionaries and traders, and were gradually superseded or controlled by their respective governments. Another influence on education was that of Islam, which tended to be traditional and conservative, and limited to study of the Koran and of classical Arabic.

The early part of the twentieth century saw a growth of interest in African education on the part of the colonial authorities. The African Education Commissions of the Phelps-Stokes Fund provided the initial impetus for further studies by the colonial governments, particularly of England and France. Educational problems were analyzed and plans were made to improve conditions in terms of the aims of the British and French for their colonies.

Christian missionaries wrote down many of the vernaculars, and introduced reading and writing to the native populations. They later introduced other kinds of learning, and emphasized crafts and handiwork.

The educational systems of England and France have set the

\(^{176}\text{Johnson, op. cit., p. 15.}\)
pattern for the educational structures of their erstwhile colonies. In order to understand the educational systems of Africa, it is first necessary to understand the systems of their former colonial masters.

As scientific, technological, and industrial expansion have taken place in the rest of the world, it has become necessary for Africa to increase emphasis on science in the curricula of its educational systems in order to take its full place in the community of nations. Without a great increase in agricultural, technological, vocational, and scientific education, Africa cannot hope to keep pace with the rest of the world.

The major problem, aside from political instability, is one of finance. Funds are needed to build and equip schools, to expand teacher education, and to pay teachers. Other problems exist in terms of language, education of girls and women, geographical difficulties in providing education, traditional aversions to education predicated on religion or other cultural influences, and inability to adjust the educational systems to the needs of the individual in terms of his aptitudes and abilities.

In science education, much needs to be done to popularize science among people of all educational levels. There is a need for expansion of science subjects at all educational levels, whether for the creation of a scientifically literate public, or for the preparation of scientists at various levels of competence. There is a need for expansion of scientific and technological facilities, for recruitment and training of science teachers, for building and equipping experimental facilities in schools, and for extending scientific (and other)
education to the greatest possible number of people.

Finally, in order to achieve a maximum integral quality, African education must be fully Africanized, both as to staff and curricula.
CHAPTER III

EDUCATION IN NIGERIA

Nigeria, with an area of 356,669 square miles, about one-thirty-third of the entire area of Africa, has grown from an estimated population of 18,000,000 in 1928 to 55,653,000 according to the 1963 census and to 56,400,000 according to a 1965 estimate; the population may be as high as 58,950,000, which represents almost one-fifth of the population of Africa. With its population density of over 165 persons per square mile, Nigeria assumes a position of great importance in any study of educational development in Africa.

The people of Nigeria are extremely diverse with regard to language, history, religion, and customs. The numbers of tribal and linguistic groups have been estimated from a minimum of 150 to as many as 250. Moslems dominate in the North, where the main languages are Hausa, Fulani, and Kanuri; in the East and West, there are many well-established Christian churches; throughout Nigeria, there are scattered innumerable

---

1Africa, op. cit., p. 93.
2Evall, Volume I, op. cit., p. 645.
5Africa, loc. cit.
animistic pagan groups. In the East, the dominant group is the Ibo, with the Ibibio, Annang, and Ijaw constituting important tribal and linguistic minorities. In the West, the Yorubas constitute the largest group with Edo, Western Ibo, and Urhobo as important minorities. In the absence of a universally spoken language, English is the lingua franca of the country, as well as the official language of the various legislatures. 6

The various peoples of Nigeria are believed to have migrated from areas both inside and outside of Africa. The Hausas claim to have come from Mecca. The Kanuri derive from desert stock and the Fulani claim to have come from North Africa and the Mediterranean coast. The Yoruba claim to have come from Sudan or Egypt, while the Ibos may have come from northeast or central Africa. One of the more important migrations, in terms of its future effect on educational problems in present-day Nigeria was the gradual spread of Fulani influence over a period of two hundred years, culminating in the Fulani Jihad, or holy war, in 1804-1808. The effect of this conquest was to spread Moslem religion and learning throughout Northern Nigeria. 7

The first Europeans, a group of Portuguese traders, arrived on the coast of Nigeria in 1472. The British arrived in the middle 1500's. Lagos, a coastal city founded by the Yorubas, became, after the fifteenth


7 "One Hundred" Facts about Nigeria, op. cit., p. 2; also "The Federation of Nigeria," loc. cit.; and also Hittinger, op. cit., pp. 74-75 et passim.
century, the chief port in Nigeria for the Portuguese and English slave trade. In order to stem the slave trade, which had been abolished in 1807, but which had continued nevertheless, the British occupied Lagos in 1861. Britain's dominion over southern Nigeria was recognized in 1885 and exploration of northern Nigeria began shortly thereafter. In 1914, the northern and southern regions were combined with Lagos to form the Colony and Protectorate of Nigeria. In 1922, the mandated territory of the British Cameroons was associated with Nigeria for administrative purposes.

Pressure for independence first was built up in the south, where the first Africans to be elected as representatives in all of British tropical Africa entered the legislative council in 1922. After World War II, an active nationalistic agitation began. In 1946, a new constitution provided for a central legislature for the whole of Nigeria and three Houses of Assembly, one for the Northern Region, one for the Eastern Region, and the third for the Western Region. In 1951, a further revision gave greatly increased autonomy to the individual Regions and a greater voice to Nigerians in the shaping of governmental policy. The 1954 Constitutional revision gave increased powers to the Regions, established the Southern Cameroons as a quasi-federal territory, and separated Lagos from the Western Region and established it as a Federal...

---

8"The Federation of Nigeria," loc. cit.; also "One Hundred" Facts about Nigeria, loc. cit.; also Boyd and van Rensburg, loc. cit.; and also Reader's Digest Almanac 1966, op. cit., pp. 687-688 and 850.

9Boyd and van Rensburg, loc. cit.


11"One Hundred" Facts about Nigeria, loc. cit.
Although the North held back for many years, fearing domination by the South, by 1957 there was a unanimous demand for independence. In 1960, Nigeria gained independence within the Commonwealth of Nations, and became a republic within the Commonwealth in 1963. (In 1961, the northern part of the British Cameroons, given a choice between independence, union with Nigeria, or union with the Cameroun Republic, elected, in a plebiscite conducted by the United Nations, to become part of Nigeria.) In August 1963, the Mid-Western Region was formed from part of the Western Region.

Since independence, the major concerns of Nigeria have been (1) the establishment of Nigeria in an important position in intra-African politics, 2) the introduction and financing of an ambitious plan for economic development, and (3) a search for internal political stability. The internal instability which still exists is due to the dissatisfaction found among various regional factions. "The vivid unit of nationalism for a West African is not the nation but the tribe. He thinks of himself not as a Nigerian or a Ghanaian but as an Ibo or a Yoruba or a Hausa or an Ashanti. We have to face the reality that for a generation at least a narrow regionalism will govern policies in Nigeria." In

---

12 Ibid. p. 3.  
13 Boyd and van Rensburg, loc. cit.  
16 "One Hundred" Facts about Nigeria, loc. cit.  
18 Eric Ashby, "Universities for Export; Agenda for Some Thinking," in International Education, etc., op. cit., p. 421.
the years 1966 and 1967, these differences have resulted in violent disruption of unity in Nigeria.

Violence broke out in Nigeria after the general legislative elections in 1964 and continued on in 1965, losing for Nigeria its reputation as an island of political stability among African nations. On January 15, 1966, junior army officers overthrew the regional governments and slew the prime minister and two of the four regional premiers. Major-General Johnson Aguiyi-Ironsi took over control of the army and restored order. In a statement to his countrymen, Aguiyi-Ironsi, who on January 17, 1966 became Head of the Federal Military Government and Supreme Commander of the Nigerian Armed Forces, declared an end to regionalism; all Regions were abolished and government was centered in the Federal Military Government. (As part of his policy, the General stated that the government would re-appraise educational policies to ensure high and uniform standards throughout the country. He stated his belief in "a need to provide an adequate and uniform educational system, from primary level, upwards to all the sons and daughters of this country.")

On July 29, 1966, barely a month after this writer was being informed by the Nigerian Vice-Consul for Cultural Affairs in New York City by the Nigerian Vice-Consul for Cultural Affairs in New York City

---


22 "Administration," ibid., p. 3.

23 "Budget Message," ibid., p. 6.
of the expected progress under the new central government, a second military coup overthrew the government, slew Aguiyi-Ironsi, and placed the leadership in the hands of Lieutenant-Colonel Yakubu Gowon. Colonel Gowon pledged the restoration of strong Regional governments and a return to civilian rule. Up to the time of this writing, the government is still under military rule. As of the first week of June 1967, Eastern Nigeria had seceded from the Federation and had declared itself the Republic of Biafra, under the military leadership of Lieutenant-Colonel Odumegwu Ojukwu, the Region's military governor.

**Educational History**

There are no records to indicate that there were any schools in Nigeria before the 1840's, during which the Wesleyan Mission and the Church Missionary Society established schools in Badagry and Abeokuta in Western Nigeria. In Eastern Nigeria, the first mission school was established by the Presbyterian Church of Scotland in 1847 at Calabar. Other missionaries opened schools: the Southern Baptist Convention of America in 1853, the Roman Catholic Mission in 1868, and the Primitive

---

24 Personal interview with Ampim Darku Blanks, Vice-Consul in Charge of the Commission on Cultural Affairs and Press Officer of the Nigerian Mission to the United Nations, at the Consulate-General of the Federation of Nigeria, New York City, June 23, 1966. For additional background on the January 1966 rebellion, see excerpts from this interview in Appendix B.


Methodists in 1894. 27

The only education available in the north was that which took place in the Koranic schools, where children recited from the Koran in Arabic, which was not their native vernacular, and also acquired some knowledge of reading, writing, and arithmetic. 28 Since the primary purpose of the mission schools was the spreading of Christianity, and since this was not acceptable to the Moslems of the north, the missions were denied any opportunity of spreading their activities there. 29 As a consequence of the conservatism of the Moslem north, the Koranic schools showed very little growth in comparison with the mission and government schools of the South. 30

In 1924, 0.22% of school-age children attended school in the north (or 16.3% if the sub-standard Koranic schools are included); in the south, 6.88% of the school-age population actually attended school. 31 By 1957, the following percentages of school-age population were actually in attendance in each of the Regions: 32


29 Anowi, op. cit., p. 44.

30 Kitchen, op. cit., p. 366.


32 L.J. Lewis, Education and Political Independence in Africa and other essays (Edinburgh: Thomas Nelson and Sons Ltd., 1962), pp. 5 and 9. Percentages computed by present writer from figures given in this source.
Region | Primary | Secondary | Technical
--- | --- | --- | ---
Lagos | 84.2% | 6.82% | 2.34%
Northern Region | 5.7% | 0.10% | 0.024%
Western Region | 75.6% | 3.48% | 0.016%
Eastern Region | 76.2% | 0.77% | 0.20%

Education in Nigeria followed the normal British pattern. Although there were few government schools at the turn of the century, by this time mission schools were receiving government support. As noted earlier, the Phelps-Stokes reports quickened the pace of government interest in colonial education. The 1925 paper, Education Policy in British Tropical Africa, and the 1935 paper, The Education of African Communities, defined the purposes of colonial education and its relationship to the community. Yet, as late as 1942, the government maintained only 31 elementary schools, 13 secondary schools, seven teach training institutions, and one vocational higher college; except for its subsidies to private educational institutions, the role of the government was mainly supervisory.

When Nigeria adopted a Federal Constitution in 1954, the responsibility for education devolved upon the respective Regional governments. However, the broad direction of educational policy, planning and finance, and higher education is a responsibility of the Federal Ministry of Education. Exercising this responsibility, in 1959 the Federal Minister of Education, after consultation with the Regional governments, appointed...

34 Okongwu, loc. cit.
the Commission on Post-School Certificate and Higher Education in Nigeria, under the chairmanship of Sir Eric Ashby, Master of Clare College in Cambridge. The Commission, which consisted of Nigerian, American, and British members, presented its report in September 1960. Entitled Investment in Education (or familiarly, the Ashby Report), it rested on three foundations: the Commission's concept of Nigeria in 1980, Harrison's study of Nigeria's needs in high-level manpower projected to 1970, and the Commission's estimates of the present capacity of the educational system.36

Although the latest available statistics (1958) showed that there were two and one-half million children at some seventeen thousand schools, over twenty-five thousand in teacher training colleges, and over eighteen hundred in higher education, the Commission, noting this remarkable achievement, stated that it failed to meet the projected needs of Nigeria. The chief deficiencies were seen as a lack of balance in pyramidal structure and in geographical distribution, and a tendency for the aspirations of educational planners to outrun the available teachers and money. Nine-tenths of primary school teachers were considered insufficiently trained, about four-fifths of secondary school teachers were not graduates, the entering class in secondary school represented only 2% of the entering class of the primary school, and only 553 pupils—representing 4.5% of the entering class of the secondary school—were doing Sixth Form work in the entire country. The Commission also criticized the shortcomings of technical, vocational, and agricultural

education. While praising the quality of higher education, the quantity was considered by the Commission to be below the level needed for educational progress in Nigeria.\textsuperscript{37}

Among the recommendations made by the Ashby Commission were (1) that numbers completing primary school in Northern Nigeria be increased, (2) that efforts be made to improve standards in primary education every place, particularly in English, (3) that secondary school recruits be increased from 12,000 in 1958 to 30,000 in 1970, (4) that 3,500 students should go on to Sixth Form work annually, (5) that 2,500 students with School Certificates should enter technical institutes each year, (6) that emphasis should be placed on increasing agricultural and veterinary education, (7) that teachers at all levels should be upgraded, and (8) that the number of university students should be increased to over 10,000 in the 1970's.\textsuperscript{38}

Sessional Paper No. 3 of 1961 committed the government to substantial expenditures on education in each of the Regions and at each level of education. The government called for a coordinated effort on the part of the Regional governments together with the Federal government to implement the recommendations of the Ashby Report, which it had fully accepted and approved.\textsuperscript{39}


\textsuperscript{38} Ibid., passim.

\textsuperscript{39} Educational Development: 1961-70, op. cit., p. 10.
Primary Education

Primary education in Nigeria is a Local Government responsibility; its structure differs sharply from place to place. Before 1954, all primary education in Nigeria was of eight years' duration. Since then, the eight-year course operates only in the Federal Territory of Lagos, where it is fee-free. The Eastern Region provides a seven-year course, of which the first four years are free. (This course was to be reduced to six years in 1964.) The Western Region provides a free six-year course, and the Northern Region provides a system of four-year junior primary schools followed by a system of three-year senior primary schools.  

In British Cameroons, now part of Eastern Nigeria, primary education consisted of an eight-year course, with two years of infants' school, two years of junior primary school, and four years of senior primary school. Those who pass the eight-year course and the government Standard 6 examination receive a First School Leaving Certificate, which serves as a minimum qualification for many positions in government and industry, and also provides entry to secondary or technical education.  

Elementary Science Education

Science in the primary schools consists mainly of nature study and so-called rural science, in addition to hygiene. Nature study is usually related to rural science, in connection with which, most schools maintain adjacent farm plots, where the students learn good agricultural practices.

---


41 Kitchen, op. cit., p. 528; also interview with Sendze.
practices. Generally, the government schools have more extensive farms than the mission schools, even to the extent of having plantations of bananas and palm trees. However, botany was generally restricted to study of the bean plant, which was studied year after year, in greater and ever greater detail. Implicit in the good farming procedures taught in connection with the school farm is the hope that the children will pass on these beneficial ideas to their parents. The study of hygiene is related to community sanitation, personal health, and other practices which can be extended to the betterment of person, home, family, and community.\textsuperscript{42}

There are plans to increase instruction in fundamental science and applied science at both primary and secondary levels. In the Eastern Region mathematics and general science courses are being brought into closer relation to children's environment and experiences. According to the Permanent Secretary of the Ministry of Education of Eastern Nigeria:

By the end of 1962, a momentous decision was taken to start science teaching in 80 selected primary schools. Suitable text books were provided and science equipments were ordered for distribution to the schools free. These schools were not given Capital grants. Teachers with science background were also selected and trained by a refresher course at Rural Science TTC at Umuahia to prepare them towards this objective.\textsuperscript{42} Personal interviews with Jephthah Anozie Abara of Nigeria, at the Ohio State University, October 31, 1964; personal interview with Michael Onyechi Modebe of Nigeria, at the Ohio State University, July 4, 1964; personal interview with Maxwell Ezigbo Nwosu of Nigeria, at the Ohio State University, January 12, 1965; also interviews with Aloba and Sendze.

\textsuperscript{43} Personal interview with Maxwell Ezigbo Nwosu of Nigeria, at the Ohio State University, January 12, 1965; also interviews with Aloba and Sendze.

trained every year until all the larger primary schools are equipped to offer Rural Science and pure science.\textsuperscript{44}

**Secondary Education**

In an analysis of secondary education under British rule, it was concluded that British-type secondary education was intended for a Nigerian elite who would lead the uneducable masses, that the secondary curriculum rarely met the needs of Nigerian society, that secondary education was stratified so as to create and perpetuate social structure, and that it would fail to produce a people capable of assuming responsibility for their own independence.\textsuperscript{45}

Even before independence, each Region was making great strides to change this picture of secondary education, to create secondary education which would be for the masses and which would meet the needs of an independent and developing Nigeria. In the separate discussions of the educational systems of the various Regions, the extent of this growth will be elaborated further.

As noted above, possession of the First School Leaving Certificate enabled one to enter service in industry or government or to gain entry to some kind of secondary education. In order to enter at higher levels of employment, however, the West African School Certificate, which has replaced the Cambridge School Certificate, awarded after passing the examination given at the end of secondary school, is a minimum requirement.

\textsuperscript{44} Letter from J.A. Garrod, Permanent Secretary, Ministry of Education, Eastern Nigeria, March 4, 1966.

Post-secondary certificates, such as the Cambridge Higher School Certificate and the G.C., A Level, carry even more prestige and potential for future advancement. "In fact, it is easier for a boy or girl with one of these qualifications to get a free university education than it is for a primary-school child to get a place in a trade center, technical institute, or grammar school—since an array of university scholarships is available annually to those formally qualified."  

Secondary Science Education

It is interesting to note that, as long ago as 1935, science syllabuses called for a search for truth in science education and stressed the practical aspect of scientific knowledge. They called for experimentation and observation on the part of the student and the use of apparatus. They noted the value of extramural expeditions, of exhibitions, and of science clubs.  

Even so, much criticism has been leveled at science teaching in Nigeria for the factual type of teaching and for the lack of facilities and opportunities for student experimentation.

Until about ten years ago, very little in the way of science was available in the secondary school, mostly because of the high cost of laboratory facilities. This was particularly true in the mission schools. Because of the increased emphasis on science and technology, and because the School Certificate in science requires a practical test—that is,

---

46 Kitchen, op. cit., p. 369.
47 General Science Syllabus for Middle Schools, Classes I-VI (Lagos: Education Department, 1935), pp. 1-3.
48 Interview with Aloba.
Many secondary schools also provide a two-year post-School Certificate course leading to the Higher School Certificate. These Sixth Forms correspond roughly to American junior college level, except for the emphasis on examination subjects. The post-school course serves to raise the competence of students to a level sufficient to meet minimum admission qualifications for a British university. Many students find that they will receive credit for these courses at American universities which serves to exempt them from some freshman-level courses. Although it may be necessary to meet other requirements for admission to foreign universities, receipt of the Higher School Certificate carries with it automatic entrance to Nigerian universities. However, not all schools are able to carry a full program of higher secondary school studies.

Of the schools providing this two-year course, fewer than half have the staff or facilities yet to offer all the science.

---

49 Interview with Sendze.

50 Interview with Abara. A description of this kind of progression in science education at the government secondary school at Umuahia in the Eastern Region is given in the excerpts from the interview with Mr. Abara, in Appendix B.


52 Interview with Modebe.
subjects required. Three years ago, \(^{53}\) therefore, an Emergency Science School was set up in Lagos. Today, more than 500 students are taking mathematics and science subjects there at the advanced level of the London General Certificate of Education, which is academically equivalent to the "principal level" of Higher School Certificate. Most of those who leave obtain the qualifications necessary for university admission. Similar courses have been provided for some years for about one-third of the students at the three branches of the Nigerian College of Arts, Science, and Technology. \(^{54}\)

In June 1958, a country-wide survey showed that all schools over five years old and preparing students for School Certificate (and in some cases, for Higher School Certificate) had some laboratory provision. Of 75 such schools, 30 were rated as inadequate with respect to laboratory facilities, 32 had an acceptable minimum, and 13 were rated as satisfactory or excellent. Of new schools (less than five years old) 35 out of 68 did not possess the minimum laboratory provision for effective science teaching. \(^{55}\) In addition, using a rule-of-thumb rating of minimum of one science library book per pupil, only 25 out of 104 schools met this criterion. \(^{56}\)

The Ashby Commission recommended that at least 8000 secondary school leavers per year should have a minimum of two years of post-School Certificate education, as a projection for the years 1960-1970. Of these, it was suggested that some 3000 go on to Sixth Form work, preferably in classes associated with secondary schools. Although the Commission commended the excellent work being done at the Emergency Science Training Centre in Lagos, which functioned as a two-year college for Sixth Form work in science, it did not feel that either this pattern or

\(^{53}\) That is, in 1959. \(^{54}\) Kitchen, op. cit., p. 374.

\(^{55}\) Cessac, op. cit., pp. 27-28. \(^{56}\) Ibid., p. 32.
the American community college or junior college systems were adaptable to Nigerian educational needs. The Report recommended the establishment of National High Schools which would provide, at first, only Sixth Form education; later, lower forms would be grafted onto the schools to enlarge them to full-fledged secondary schools. The curriculum, of course, would already be set by examination requirements. However, the Commission emphasized the importance of general education for every student. For students in scientific or technological fields, the Commission recommended that each school provide courses in chemistry, physics, mathematics, botany, and zoology, from which the students might choose; it was also recommended that these courses be made available to the non-scientifically-minded for purposes of general education.\(^{57}\)

Higher Education

In a study of the development of higher education in Nigeria from 1928 to 1953, it was concluded that the development consisted of a series of improvisations which lacked overall long-range planning. The British educational system dominated Nigerian education at all levels, with higher education meeting British standards at the expense of Nigerian needs. The University College at Ibadan, the only four-year institution in Nigeria in 1953, prepared students for the London University's baccalaureate degree while the needs of trained personnel in health, education, agriculture, research, government, and industry went unanswered.\(^{58}\)

\(^{57}\) Investment in Education, op. cit., pp. 12-13 and 73-76.

\(^{58}\) Alliu Babatunde Fafunwa, An Historical Analysis of the Development of Higher Education in Nigeria (unpublished Ph. D. dissertation,
The Ashby Commission, noting that the current university output was 300 graduates per year, recommended that the annual output be raised to 1000. This would necessitate 7500 student places in universities by 1970, with 10,000 places during the following decade. The Commission saw the need for degree studies in African studies, commerce and business administration, teaching, engineering, medicine and veterinary science, agriculture, and law; nowhere did the Report mention scientific studies as a means toward expanding research, teaching, and technology. The Commission noted the excellent work being done at the University College at Ibadan, which had faculties of arts, science, agriculture and veterinary science, medicine, and engineering, and an institute of education in 1960. Also noted was the work done at the University of Nigeria at Nsukka, which had faculties of arts, science, and engineering. The Commission made proposals for expansion of facilities at these universities and for the establishment of new institutions of higher education in each of the Regions. 59

Impressed by the performances of the American Land Grant Colleges which were designed to meet the needs of agricultural states, and by the large intake and practical bent of part of the American university system, some Nigerian educational leaders felt that the new University of Nigeria at Nsukka might follow the American rather than the British system in order to produce some graduates with training more practical than


59Investment in Education, op. cit., pp. 22-30 and 113-123.
In writing of the relationship of Nigerian universities to the nation, the Pro-Chancellor and Chairman of the Council of the University of Ibadan laid down some principles for the universities to follow if they are to fulfill their mission: (1) Nigerian universities should be sensitive to the legitimate needs of the great masses of the people and should be open to all; (2) the universities should be distinguishable from those of other nations; (3) the universities should operate under a broad charter of responsibility and authority; (4) the universities should not be provincial in their outlook; (5) research must be given priority; (6) the universities should instill and generate patriotism in young people and (7) the universities should work cooperatively with one another.

When the University of Nigeria opened in October 1960, science was not included in its curriculum. However, when the Enugu branch of the Nigerian College of Arts, Science and Technology became incorporated into the University of Nigeria in 1961, its Faculty of Science became part of the offerings available at the University. Yet, on June 15, 1963, when the University of Nigeria became the first institution of higher learning in West Africa to grant its own degree to its graduates, no degrees were given in science.

Following the recommendations of the Ashby Commission, the governments of Northern and Western Nigeria planned the establishment of a

---

60 Hunter, op. cit., pp. 264-265.


university in their respective regions. Following the recommendations of the Carr-Saunders Delegation in 1961, the Zaria branch of the Nigerian College of Arts, Science and Technology was combined with the Ahmadu Bello College at Kano and some other small units of higher education to form the Ahmadu Bello University, which opened on October 4, 1962 and was named for its first Chancellor, the Premier of Northern Nigeria. One of the important stated objectives of the university was the promotion of research and the advancement of science, and to further these ends, a Faculty of Science, with departments of Botany, Chemistry, Mathematics, Physics, and Zoology was added to the existing offerings of the College of Arts, Science and Technology.\footnote{Sasnett and Sepmeyer, \textit{op. cit.}, p. 549.}

In June 1961, at the request of the Federal government, a UNESCO Commission was appointed to advise on the creation and development of the University of Lagos. In its report, the Commission asked that consideration be given to "the need for the continued expansion of the sixth-form facilities with particular emphasis on science instruction in order to ensure a sufficient number of candidates for the expanded university system."\footnote{Ibid., pp. 170-173.} The University of Lagos opened in 1962, but Faculties of Science and Engineering were not added until the third academic year, that is, in 1964.\footnote{Ibid., pp. 175-177.}

In 1960, the government of Western Nigeria sent out a team to study universities in the United States, Mexico, Brazil, and Israel. Following the recommendations of the team, the University of Ife was established and started classes in 1962, when the facilities of the Ibadan
branch of the Nigerian College of Arts, Science and Technology were
turned over to the new university. The first courses were limited to
those previously offered at the College of Arts, Science and Technology,
but at a university level; these included offerings in science. 66

Technical and Vocational Education

In 1955, there were seven trade centers in Nigeria which offered
training to boys who had passed the Primary School Leaving Examination.
Following the suggestions of a mission from the International Bank for
Reconstruction and Development, technical education is being expanded,
although not as rapidly as the needs of the country dictate. Many in­
dustrial concerns and utilities corporations carry out extensive train­
ing programs of their own; these help them to meet their own manpower
shortages as well as to increase the general supply of skilled workers
in the federation. 67

By the time of the Ashby Report, there were ten trade centers,
four technical institutes and three branches of the Nigerian College of
Arts, Science and Technology. The Report stressed the need for inclu­
sion of crafts and technical subjects in the curricula of both primary
and secondary schools. The Report also emphasized the need for expanded
facilities for training in commerce, agriculture and veterinary science
at all levels of education. In defining the three levels of technically
trained personnel, the Report emphasized the need for a knowledge of


67 The International Bank for Reconstruction and Development, The
Economic Development of Nigeria (Baltimore: The Johns Hopkins Press,
1955), annotated in Brembeck and Keith, op. cit., p. 147.
elementary science and calculational ability sufficient for the crafts­
man to ply the trade in which he has served an apprenticeship, the need for the technician to acquire a good knowledge of mathematics and sci­
ence relating to his own specialty, and of the need for the technologist to have advanced training in engineering or science. In answer to these technical needs for this kind of training, today's technical high schools in Nigeria provide a broad education in mathematics and sci­
ence.

69

Teacher Education

The teaching profession in Nigeria, though diverse in training, composition, and technical proficiency, has one feature which character­izes the bulk of its membership: poor preparation for the task of teach­ing. At the bottom of certificated teachers are Grade III teachers who have received two years of professional training after primary educa­tion; these may teach up to Standard IV in the primary school. Grade II teachers are School Certificate holders or Grade III teachers who have had a two-year course, or secondary modern school leavers in Western Ni­geria or primary school leavers in the rest of Nigeria who have had a four-year professional course; these may teach at all grade levels in the primary school. Grade I teachers have had a two-year course at an Advanced Teacher Training College, although there are several other routes by which this status may be reached; these may teach up to School

---


Certificate level in secondary schools, training colleges, and technical institutes. Other kinds of teachers include graduate teachers, teachers with United Kingdom Ministry of Education Certificate or the Professional Certificate of the University of London Institute of Education, technical instructors with or without teaching qualifications, uncertificated teachers with or without training, and probationary teachers.\textsuperscript{70}

In 1957, 73\% of all teachers in Nigeria were either uncertificated or probationary. The majority of teachers at the primary level were in this category, with less than 1\% graduate or with advanced teacher training. More than one-fourth of secondary school teachers were uncertificated and almost another fourth had no better than Grade II certification. In teacher training institutes, about one-eighth of the instructors had less than Grade II certification.\textsuperscript{71}

The Ashby Commission recommended immediate measures to upgrade some 80,000 teachers out of about 92,000 by means of intensive in-service education. Targets for 1970 include (1) a total of 180,000 teachers (2) expanded facilities for teacher training, with an output of 3000 Grade I teachers annually, (3) to improve the quality of teacher training by making provision for a staff of 3500 lecturers and by preparing all students for Grade I certificates, and (4) to take measures to improve the standards of primary and secondary education.\textsuperscript{72} As a step toward implementing these recommendations, the Federal Advanced Teacher Training College was founded in 1962 to provide a three-year course to

\textsuperscript{70}\textit{Survey of the Status, etc., op. cit.,} p. 70.

\textsuperscript{71}\textit{Investment in Education, op. cit.,} p. 91.

\textsuperscript{72}\textit{Ibid.}, pp. 15-17 and 80-90.
train secondary school teachers. The school is open to students with five years of secondary education; upon completion of the course, they receive the Nigerian Certificate of Education.73 The federal and regional ministries of education have also undertaken to organize further training for primary teachers already in service, in order to qualify sub-standard teachers and to upgrade certificated teachers. The means taken for further training include (1) evening classes and vacation courses, (2) lectures, model lessons and visits, (3) individual or group travel, and (4) publication of professional educational magazines.74 Two other means which have been suggested for improving teacher training and the status of teachers are programmed instruction75 and formation of teachers' organizations. With regard to the latter, the Nigerian Union of Teachers, founded in 1931, had 44,126 members in 298 branches all over Nigeria in 1957.76

Education in Eastern Nigeria

While the Ministry of Education controls education, the government itself runs only 11 primary schools and 11 post-primary institutions out of a total of over 7000 institutions of all kinds. The great majority of institutions are owned and managed by religious missions,

private individuals, and private associations. Local councils do run many primary, secondary and teacher training institutions. All institutions are subject to inspection and control by the Ministry of Education.\footnote{World Survey of Education, op. cit., p. 859.}

Primary schools provide six years of education, starting at age six. Upon completion of the course and receipt of the First School Leaving Certificate, pupils may enter (a) a three-year junior secondary school, (b) a five-year senior secondary school, or (c) a trade center, trade school, or other vocational institution. Pupils who complete the senior secondary course may (a) remain for two years in the Sixth Form, (b) enter a Grade II teachers' college or the three-year Advanced Teachers' Training College, or (c) take vocational training at a post-secondary level.\footnote{Ibid.}

Primary Education

The six-year course, consisting of Elementary I-VI, is conducted in the vernacular (Igbo or Efik) during the first three years and in English the latter three years. The curriculum includes written and spoken English, arithmetic, history, geography, handwriting, health, religious knowledge, physical education, nature study, gardening, singing, and handwork. A Nigerian language, science, and agriculture have recently been made required subjects.\footnote{Sasnett and Sepmeyer, op. cit., p. 467.}

Science Education

At the end of 1962, science teaching was started in 80 selected...
primary schools. Textbooks were provided and science equipment was ordered for free distribution to the schools. Teachers with science background were selected and given refresher-training at the Rural Science Teacher Training College at Umahia. The plan is to train 100 science teachers annually until all of the larger primary schools are equipped to offer rural science and pure science. This is in line with Eastern Nigeria's policy to introduce science and place emphasis on agriculture.

A science syllabus drawn up by Indian and Nigerian experts envisaged the distribution of courses as follows: Elementary I-II, nature study and gardening; Elementary III-IV, rural science including gardening and elementary science; Elementary V-VI, agriculture and elementary science taken separately, but correlated at convenient points. Topics in the syllabus include: Elementary I—weather observation, nature walks, nature displays, seed planting, farm observation; Elementary II—differences between living and non-living things, differences between plants and animals, living habits of common animals, birds, and insects, seed planting, observation walks, the sun; Elementary III—vegetable gardening, soil and compost study, animal study, nature corner, parts and uses of plants, heavenly bodies; Elementary IV—gardening, soil composition, structure and germination of common seeds, study of common insects, matter and its three states, energy and power sources, nature corner;

80 Letter from Garrod.
Elementary IV—world around us, animal classification, human body, flowers, measures, air, water (solvent, filtration, distillation, pressure, community distribution), heat (measurement, conduction, convection, radiation); Elementary VI—plant life and propagation (photosynthesis, osmosis, etc.), pollination and fertilization, animals in the soil, insects, habits of common animals, light, thunder and lightning, machines, magnetism, electricity, stories about inventions and scientists.83

In agriculture, students in Elementary III and IV will have had some experience in vegetable and flower gardening. More intensive practical work follows in the upper two grades, but topics requiring further treatment in the classroom are as follows: Elementary V—land measurement, crop rotation, farm crops, farm records and accounts, insect and animal pests, plant diseases, farm animals; Elementary VI—further study of soil, permanent and export crops, farm records and accounts.84

In health education, most of the course consists of training in practical health habits; in the lower classes, this is mostly through informal instruction and by example of the teacher, while in the upper classes these are supplemented by formal instruction. Topics covered in the formal instruction include: Elementary IV—water supply, mosquitoes and malaria, breathing, worm infestation; Elementary V—harmful insects; Elementary VI—first aid.85

The major criticisms leveled at the present teaching of science in the primary schools of Eastern Nigeria are (1) that there is not

84 Ibid., pp. 46-49. 85 Ibid., pp. 49-51.
enough science taught, (2) that the equipment is insufficient, and (3) that the teachers have almost no academic preparation in science. As has been noted above, progress in the direction of ameliorating these difficulties has already been made.

**Secondary Education**

Among the types of secondary schools in Eastern Nigeria are the following (with length of course in years in parentheses): grammar schools (5) commercial secondary schools (5), modern schools for girls (2), trade centers (3), junior agriculture schools (2-5), technical institutions (3), comprehensive secondary schools (6), and teacher training colleges (2-4). The curriculum includes English, mathematics, history, geography, religious knowledge, vernacular language, Latin, and in some schools general science, physics, chemistry, biology, agriculture, domestic science, and art. Nigerian languages have been introduced into the curriculum and every student is required to study at least one. Also, agriculture has been made a required subject for the first three years.

In line with the policy of expansion of secondary education, 61 new secondary schools were opened in 1962, bringing the total to 197. In 1963 and 1964, the planned expansion of government secondary grammar

---

86 Interviews with Abara, Modebe, and Nwosu.
88 *Policy for Education, loc. cit.*
schools and the expansion of science teaching in more secondary schools proceeded satisfactorily. The enrollment in secondary modern schools quintupled in the five-year period 1958-1963, while the number of schools doubled.

As of 1965, Sixth Form classes were held at 28 secondary schools. Entrants had to have either the West African School Certificate or the West African G.C.E.; upon completion of the course, they sat for University of Cambridge Joint Examination for the Higher School Certificate and G.C.E. At 26 of the schools, there were 246 first year and 209 second year students in the arts, and 735 first year and 519 second year students in the sciences. A typical Sixth Form course in science may include either (1) botany, chemistry, zoology, and general paper, or (2) chemistry, zoology, and physics, or (3) chemistry, physics, and mathematics, or (4) geography, botany, zoology, and general paper.

Science Education

At present, all secondary schools teach science. Students study general science the first year and add other sciences in the subsequent four years. Science subjects include physics, chemistry, biology, botany

---


94 Sasnett and Sepmeyer, op. cit., p. 474.
and in a very few schools, zoology and geology. Government schools are generally better equipped for the teaching of science than are mission or private schools. Laboratory facilities are generally good, especially in the Sixth Form courses. Equipment is fairly adequate, except for biology. The present emphasis is on "cookbook" experimentation by students; this has been criticized by some Nigerians who feel that experiments should be more open-ended and that, indeed, there should be more emphasis placed on student experimentation.

Since 1955, the Ministry of Education has placed accelerated emphasis on the teaching of science in secondary schools. In 1957, the Commonwealth Fund provided funds for the equipping of science facilities. In 1960, a special government expenditure of 598,000 pounds went to further this scheme. The sum was concentrated in a few schools in order to bring them up to a high level, rather than to dilute the effect by spreading the funds among too many schools. Half of the funds went toward increasing the number of Sixth Form streams in government secondary schools. Thus, the number of Sixth Form schools offering science were 2 in 1960, 10 in 1962, 15 in 1963, and 17 in 1964.

Considerable funds are being expended for the expansion of science teaching, for buildings, for equipment, and for the training of science teachers.

95 Letter from Garrod.  
96 Interviews with Abara, Modebe, and Nwosu.  
97 Letter from Garrod.
Teacher Education

In 1963, there were 4,623 students enrolled in Grade III teachers colleges and 5,610 in Grade II teachers colleges in Eastern Nigeria. In the same year, of the certificates issued, 2,564 were Grade II, 2,720 were Grade II, and 74 were Grade I. As a step toward improving the quality of teachers, training of Grade III teachers was to be discontinued after December 1964. Grade III colleges are being converted to other uses and the staff of Grade II colleges is being improved.

The Advanced Teacher Training College created in 1963 offers a three-year training course for teachers for secondary schools and training colleges. Entrants must have the W.A.S.C. Each student studies education and two secondary school subjects chosen from English, French, mathematics, history, geography and science subjects, including rural science. Candidates sit for the examination for the Nigerian Certificate of Education upon completion of the course.

The Conference on the Review of the Educational System in Eastern Nigeria showed concern for the lack of knowledge of the average teacher of the elements of science, and recommended in-service training to broaden the teachers' background and expand their horizon. The Conference noted that no more than one or two of the teacher training colleges had a science curriculum, and recommended the inclusion of Elementary Education.

Science into the curriculum, either as a subject-matter course, or as part of the general education of the teacher, or both. The Conference further recommended that every Grade II and Advanced Teacher Training College be equipped with a science laboratory and that science be made compulsory for all students in training colleges. 102

Although there are teacher shortages in several fields, the Ministry of Education is giving priority to the training of teachers of science for secondary schools and Sixth Forms; the goal is to have a minimum of 50% graduate teachers. An approach has been made to the World Bank for funds to expand the science program in secondary schools and in teacher training colleges all over the Region. 103

Higher Education

As noted above, the University of Nigeria at Nsukka was created by an act of the legislature of the Eastern Region in 1955. The University opened in 1960 and graduated its first class in 1963. In 1961, the Enugu branch of the Nigerian College of Arts, Science and Technology was incorporated into the University of Nigeria.

Among its offerings, the University has a Faculty of Agriculture, with Departments of Agricultural Economics, Agricultural Engineering, Animal Science, Home Economics, Plant-Soil Science, and Veterinary Science, Faculty of Education, with Departments of Education, Physical Education and Vocational Education, a Faculty of Engineering, with Departments of Architecture, Civil Engineering, Electrical Engineering, Land

103 Letter from Garrod.
Economics, Mechanical Engineering, and Surveying, and a Faculty of Science, with Departments of Botany, Chemistry, Geology, Mathematics, Microbiology, and Physics. 104

Vocational and Technical Education

Efforts are continuing to be made to produce uniform technical and vocational training throughout the Region and the entire Federation. There are several types of training offered, and at each of the levels of education.

Government handicraft centers offer training in metal work or woodwork to boys in the upper two elementary classes who are within walking distance of the centers and who have been selected by their headmasters. Evening classes for adults are also provided at these centers. In 1962, there were nine such centers in Eastern Nigeria, enrolling 6,478 students.

Trade centers or trade schools offer three-year courses in various crafts to both boys and girls with primary education. At the end of two years, the best students may transfer to secondary grammar, technical, or commercial schools. Some of the trade centers offer five-year courses leading to the Final Craft Certificate of the City and Guilds of London Institute or comparable certificates. There also exist junior agricultural schools which are at the level of the trade centers.

Secondary technical schools offer four-year courses with a strong emphasis on the sciences and technical work. In 1962, there were seven such schools in Eastern Nigeria. The Government Technical Institute at

104 Sasnett and Sepmsyer, op. cit., pp. 479-489.
Enugu is one of these institutions; however, it also provides a senior course of two or three years which provides technician level training in building and civil engineering, mechanical engineering, electrical engineering, telecommunications, and commerce.

The Port Harcourt Comprehensive School was established in 1962 by the Eastern Region in cooperation with the United States Agency for International Development (AID). This new secondary school, based on the best practices of American and British education, provides a broad curriculum, with strong emphasis on general education and on training of craftsmen, technicians, and technologists for manufacturing, agriculture, retail trade, and commerce. There is strong academic preparation for the West African School Certificate as well as a strong bias in science and mathematics in preparation for university entrance.\(^{105}\)

**Education in Northern Nigeria**

Northern Nigeria is a vast region which had, in 1960, a population of 18 million; yet, so far behind the rest of the country did the Region lag in education that almost four million children had almost no education at all.\(^{106}\) The Ashby Commission placed the proportion of children in primary schools in the Region at one out of eleven, although in some areas it was as low as one out of fifty; of the two million children of secondary school age, only about four thousand were actually in attendance. There were 57 Northerners studying at the University of


\(^{106}\) *Asia, Arab States, Africa, etc.*, *op. cit.*, p. 50.
Ibadan, a few studying engineering at the Zaria branch of the Nigerian College of Arts, Science and Technology, and others studying at overseas universities. The educational stemmed from the conservatism of the Moslems whose educational experience was limited to that of the Koranic schools, and which militated against allowing missionaries to penetrate the area with western education. 107

Educational facilities have expanded considerably in Northern Nigeria, especially in the past decade. In 1929, there were 95 government elementary schools, 152 mission schools, and 20,000 Koranic schools. By 1964, there were 2684 primary schools of which 1372 were N.A. (Native Authority or local government), 1311 were V.A. (Voluntary Agency or mission), and one was a government school. In 1929, there were 12 middle schools and one secondary school; in 1952, there were seven full secondary schools; in 1962, there were 55 secondary schools; in 1964, there were 140 post-primary schools, of which 12 were craft schools, 5 were commercial schools, 4 were technical schools, 65 were grammar schools, and 54 were teacher training schools. In addition, by 1962 there were Sixth Form courses offered in nine secondary schools; the first was offered in 1959. 108

Primary Education

At the age of six, children enter the primary school, which is of seven years' duration, divided into the four-year junior primary and the

three-year senior primary. Instruction is in English, Hausa, or Yoruba. The curriculum includes English and vernacular studies, writing, arithmetic, history, geography, rural science or domestic science, handwork including art, physical education, and religion. No natural science appears to be offered. At the end of primary education, students are awarded the Certificate of Primary Education.109

Secondary Education

Some Native Authorities operate two-year programs corresponding to the first two years of secondary education; these were called middle schools, then junior secondary schools, then provincial secondary schools. Entrance to these and to secondary grammar schools, teachers' colleges, craft schools, and certain courses at the Technical Institute is secured by successful passage of and standing on the Common Entrance Examination given at the end of Primary VII.110

The curriculum is approximately the same as in the secondary schools of Eastern Nigeria, since this is imposed by the demands of the W.A.S.C. examination. Local variations might occur in language and religion; that is, a northern school in the Region might offer Hausa, Arabic and Islamic religious knowledge, while a southern school might offer Yoruba and Christian religious knowledge. As of 1965, twelve schools were offering Sixth Form courses, which included nine different types of concentrations in science. As with other Regions, five-year students sit for the W.A.S.C. and G.C.E.; Sixth Form students sit for

109 Sasnett and Sepmeyer, op. cit., p. 517.

110 Ibid., pp. 516-517.
the Higher School Certificate and G.C.E. Joint Examination of the Uni-
versity of Cambridge.  

It is expected that there will be a continued growth in the num-
ber of secondary schools in the Northern Region but, because of the ex-
pense of providing boarding accommodations, most of the expansion will
be in the form of day classes. Much of the expansion will be in the
form of comprehensive secondary schools, which combine in one school
academic, technical, and commercial courses.

Teacher Education

Between 1959 and 1962, the number of teachers qualifying annual-
ly from teacher training colleges in Northern Nigeria doubled (to over
1700 in 1962). There were then 7600 teachers being trained in 54 col-
leges, an increase of 60% over 1960. In line with the policy of phasing
out Grade III certification, where three-fourths of the primary educa-
tion trainees were enrolled in Grade III schools in 1961, only one-third
were so enrolled in 1962. Unfortunately, neither the Grade III nor the
Grade II program requires much in the way of science subjects as prepa-
ration for teaching in the primary schools. Some time may be devoted to
general science, rural science, and health education in the Grade II
program. It appears, however, that it will be some time before pri-
mary school youngsters will be able to acquire a firm foundation in gen-
eral science, judging from the paucity of science background which their

111 Ibid., pp. 516-517.
112 The Progress of Education in Northern Nigeria, loc. cit.
113 Ibid., p. 9. Also, Sasnett and Sepmeyer, op. cit., pp. 535-537.
teachers are receiving in their training.

The Northern Secondary Teachers' College at Zaria replaced the course given formerly at the Nigerian College of Arts, Science and Technology in 1962, opening with an enrollment of 180. In 1964, the college admitted girls for the first time, thus becoming the first co-educational government institution in Northern Nigeria. The three-year college had its first graduating class in 1965. Successful graduates are awarded the Nigerian Certificate of Education.114

In 1965, a loan was negotiated with AID for the construction of four new training colleges and the expansion of twelve others.115 Also, plans have been made for new buildings at Zaria and Kano. Researchers from Ohio University are conducting research at training colleges to develop techniques for training teachers for primary schools. In the light of these and other developments, it appears that the government of the Northern Region is determined to accelerate its progress in teacher education.116

Higher Education

In 1962, Ahmadu Bello University was founded, absorbing the Zaria branch of the Nigerian College of Arts, Science and Technology, the Institute of Administration at Zaria, the Institute of Agricultural Research at Samaru, and the Abdullah Boyero College of Islamic Studies at

114. The Progress of Education, etc., loc. cit. Also, Sasnett and Sepmeyer, op. cit., p. 541.
Kano. Other institutions of higher education include the Advanced Teacher Training College at Zaria, the Kaduna Technical Institute, and the Veterinary Research Institute at Vom. 117

At the Ahmadu Bello University, it is possible to earn degrees in architecture, a science (biology, botany, chemistry, physics, or zoology), agriculture, veterinary medicine, and civil, mechanical or electrical engineering, among others. 118

Vocational and Technical Education

Students with primary education who have passed the Common Entrance Examination may enter craft schools which offer a three-year program of general studies with a bias toward crafts. At the end of the course, students sit for the entrance examination to one of the technical training schools or the Kaduna Technical Institute.

There are three government technical training schools, one each at Bukuru, Kano, and Ilorin, which opened in 1962, 1963, and 1964, respectively. The three-year program is one of general education, with emphasis on mathematics and general science, and a much heavier bias toward craft courses than is found in the craft schools. The course follows the syllabus of the City and Guilds of London Institute and prepares students to sit for the Federal Craft Training Certificate.

The Government Technical Institute at Kaduna offers technician level courses leading to the City and Guilds of London Ordinary Certificate in mechanical engineering, electrical engineering, or building and

118 Sasnett and Sepmeyer, op. cit., pp. 523-524.
Education in the Western and Mid-Western Regions and Lagos

The Mid-Western Region was created in the fall of 1963 and there has not been time for sharp differences in educational policy to occur between the Mid-Western Region and the Western Region from which it was formed; therefore, the educational systems of both Regions will be discussed together. Similarly, since the Federal Territory of Lagos is entirely contained within the Western Region, its educational system likewise will be discussed simultaneously with that of Western Nigeria.

Primary education has been free, but not compulsory, in the Western Region since 1955 and in Lagos since 1957. Most primary and secondary schools in Lagos are managed by voluntary agencies and independent proprietors, but they are open to all pupils, irrespective of background. In the Western Region, over 98% of children of primary school age are actually in attendance.

Secondary education is provided in two types of schools: secondary modern and secondary grammar. The modern school has a pre-vocational bias with emphasis on agricultural, commercial, and industrial training. The grammar schools, patterned after those of England, offer traditional classical training. Sixth Form education, which developed slowly because of difficulties in financing and staffing, was provided in 18 out of about 200 secondary grammar schools in the Western Region.

Higher education is provided in the Universities of Lagos, Ife, and Ibadan, the Yaba Technical Institute in Lagos, the Federal Advanced

Teacher Training College, the Western Region Technical College, and three advanced teacher training institutions in the Western Region. 120

Primary Education

Children may enter primary education at the age of six. The four-year course in Lagos is conducted in Yoruba for the first four years and in English with Yoruba as a supplementary language in Yoruba schools and the entire program in English in international private schools. In the Western Region, classes are conducted in Yoruba for two years and in English for the last four. In the Mid-Western Region, classes are conducted in one of several vernaculars for the first two years and in English for the last four.

The duration of primary education is six years in the Western and Mid-Western Regions, and eight years in Lagos, although these may be changed in the near future. Although the curriculum includes nature study, there does not seem to be any requirement for rural science or for general science. The Primary School Leaving Certificate is awarded at the conclusion of primary education; this, together with a competitive entrance examination, permit entry into secondary education. 121

Secondary Education

In 1955 the total number of secondary grammar schools was 70; in the fall, 260 secondary modern schools were added to the possibilities for secondary education for the children of the Western Region. The

121. Sasnett and Sepmeyer, op. cit., pp. 545-546.
The purpose of the secondary modern schools is to provide a kind of secondary education which will be of most value to most boys and girls, rather than for the small minority of children for whom English secondary grammar education was devised. The courses vary in length from two to four years. The regular three-year curriculum includes mathematics, English, history, geography, home economics, rural science, arts and crafts, music and singing, and religious knowledge. The four-year commercial curriculum includes mathematics, English, history, geography, home economics, rural science, arts and crafts, music and singing, religious knowledge, commerce, bookkeeping, accounting, shorthand, and typing. As in the other Regions, the secondary grammar school is of five years' duration and has the same type of program, leading to the W.A.S.C. and G.C.E. Western Nigeria increased the number of its secondary grammar schools from 42 to 138 in the ten-year period ending in 1960, with a pupil enrollment of nearly 25,000 in 1960. A serious problem in the Western Region was the preparation of Sixth Form students, particularly in science. To this end, the Emergency Science Training Center in Lagos was set up with a view to providing 2000 men of good School Certificate level in science subjects for Advanced G.C.E. who could staff universities and the research departments of the Federal Service.


123 Sasnett and Sepmeyer, op. cit., pp. 546-548.


125 Ibid. Also "Education in Nigeria," Foreign Education Digest, XXVI (October-December, 1961), p. 16.
In 1962, 26,000 of the 40,000 primary school teachers in Western Nigeria were untrained. The government's plans to have at least one-half of the teaching staff trained by 1967 led to an in-service training program involving 3,000 untrained primary school teachers who were enrolled in twenty new colleges opened in January 1962. Since then, as noted earlier, the two-year Grade III colleges are being phased out. In its place, prospective teachers are expected to enroll in Grade II colleges. These, at present, have three different courses: (1) a two-year "returned" course for Grade III teachers who wish to be upgraded, (2) the regular two-year course for holders of the W.A.S.C. or G.C.E., "O" Level, and (3) an experimental three-year pilot scheme for those with the Modern School Leaving Certificate or three years of secondary grammar school. Compulsory subjects include English, arithmetic, and principles and practice of education in Lagos; or religious knowledge, music, art, domestic science, agriculture, needle work, English literature, elementary mathematics, geography, and history in the Western Region. In none of the Regions is the study of natural science a requirement for primary teachers.

Grade II teachers may apply for further training in a rural science college or other colleges approved for Grade I work. Completion of the two-year course, passage of two teaching subjects at the advanced level of the G.C.E., completion of a minimum of three years of Grade II teaching, and passage of a practical teaching test leads to Grade I

---

certification, which qualifies for teaching in secondary schools.¹²⁷

Candidates for admission to the Federal Advanced Teachers' Training College at Yaba in the Federal Territory of Lagos or to the Advanced Teachers' Training College at Ibadan in the Western Region must possess (1) the W.A.S.C. or equivalent with a credit in English, or (2) the G.C.E., with passes in four subjects, one of which must be English, or (3) a Grade II Certificate. Selection is by competitive examination and interview. The course is of three years' duration and the curriculum includes principles and practice of education, including a total of twelve weeks' practical teaching during the second and third years, three years of English, three years of two major subjects (e.g., mathematics and physics), and one or two minor subjects. Internal examinations are taken at the end of the first and second years; the final examination for the award of the Nigerian Certificate of Education is administered near the end of the third year by the Institute of Education of the University of Ibadan. The candidate must satisfy the examiners in education, including an examination in practical teaching, and in each of his major subjects.¹²⁸ Successful candidates may teach in the junior forms of secondary schools or in Grade II teacher training colleges.¹²⁹

Higher Education

The University of Ibadan in the Western Region was founded on November 17, 1948 as the University College of Ibadan, with degrees

¹²７Sasnett and Sepmeyer, op. cit., pp. 591-592.


¹²９Sasnett and Sepmeyer, op. cit., p. 592.
awarded by the University of London. During the academic year 1962-63, it became the University of Ibadan and awarded its own degrees; at that time, there were 1,779 students.

Admission requirements are similar to those of other Nigerian universities. Faculties include arts, science (with departments of botany, chemistry, geology, mathematics, physics, and geology), medicine, agriculture and veterinary science, economics and social studies, and education and intra-mural studies. Science candidates take a three-year course leading to the B. Sc. degree. Education candidates take, depending upon their qualifications, (1) a three-year degree course in either arts or science subjects, with studies in education and practical teaching, completion of which leads to the Bachelor of Arts or Bachelor of Science in Education (B. Ed.), (2) a one-year course open to university graduates who wish to earn the Post-Graduate Certificate in Education, or (3) a one-year course open by competitive examination to non-graduate teachers who wish to earn the Associate Diploma of Education.130

The University of Ife was created by an act of the legislature of the Western Region on June 8, 1961. When it opened in October 1962 at Ibadan, there were 224 students in five faculties, as follows: arts, economics and social studies, law, science (including pharmacy), and agriculture. Some departments will remain at the Ibadan campus when the permanent campus at Ile-Ife is completed. The Faculty of Science includes Departments of Chemistry, Geography, Physics, Zoology, and Pharmacy, and offers three-year courses leading either to the Bachelor of

science or Bachelor of Pharmacy degree.  

The University of Lagos was established on October 22, 1962 by an act of the Federal Government which acted on recommendations of the Ashby Commission and an Advisory Commission of UNESCO in 1961. The University opened with 130 students in faculties of medicine, business and social studies, and law. The 1964 academic year saw the addition of four new faculties: arts, education, engineering and science. In 1965, the University moved to its permanent campus in North East Yaba in the Federal Territory of Lagos. The Faculty of Science offers a three-year B. Sc. degree program with subject matter in biology, chemistry, physics, geography, pure mathematics, applied mathematics, and pure and applied mathematics. The Faculty of Education awards the Diploma in Education after a one-year course or concurrently with the Arts or Science degree at the end of three years.

Vocational and Technical Education

There are four trade centers in Western Nigeria and one each in Lagos and in Mid-Western Nigeria which provide three-year courses similar in purpose and content to those of the other regions. Commercial training is given in three types of courses: (1) secondary modern schools (three years secondary modern and one year commercial), (2) secondary commercial schools (five years leading to Royal Society of Arts

---


132 Nigerian Universities, op. cit., p. 3. Also, Sasnett and Sepmeyer, op. cit., pp. 548-556.
Certificate, and (3) senior commercial colleges, which are part of technical institutes (two years post-secondary).

The Federal School of Science has superseded the Emergency Science School at Lagos, which was established in 1958 to provide Sixth Form courses strongly emphasizing science. Graduates receive the G.C.E. Advanced Level of the University of London and may enter Nigerian universities.

The Yaba Technical Institute in Lagos offers a number of courses to train technicians in civil, electrical, mechanical, and radio engineering. Some of these courses overlap secondary and higher education, with students normally being admitted after five years of secondary school. The courses are usually organized on a sandwich basis, whereby students attend the institute for two full sessions with a period of training in between. There are also part-time day release classes and part-time evening classes. Successful students are awarded the Yaba Technical Institute Certificate or the United Kingdom Ordinary National Certificate.

The Western Region Technical College at Ibadan offers a program similar to that of the Yaba Technical Institute except that commercial courses are also offered.133

Problems and Needs in Nigerian Education

Nigeria's educational purpose is the same as its national purpose, which is to create a good society and a good life for all of its citizens. Thus, it devolves upon the schools to direct their attention

to the civic and political needs, the social and personal needs, and the economic and technological needs of the nation. Conversely, although it is true that education must serve national purposes, it is equally true that the nation must serve the needs of the individual. It follows then that there is a need for Nigeria to develop a comprehensive plan for the development of education in the entire country. The plan must focus on common national purposes in education in order for a unified efficient system to be developed. During these days when the nation is being torn asunder by regional dissensions, and when opportunities for education are often influenced by factors of geography, history, and religion, a national plan will have great value in correcting differences and providing equal access to education.

What is also needed is an educational philosophy consonant with the needs of the nation and the aspirations of its people. For Nigeria, this means breaking the fetters imposed by a colonial mentality and outlook toward the value of education. Some of the mistaken notions regarding education, of which Nigerians must disabuse themselves, are:

- that the end-product of education is the possession of a degree or certificate;
- that grammar schools should train the best of our boys and girls who will foster a system of education for the elite leader;
- that the road travelled in education by the British must ipso facto be travelled by Nigerians;
- that education of the many is dangerous unless we can find jobs for all; and the corollary of this;
- that government is the job provider for all who went to school;

134 John W. Hanson, "The Nation's Educational Purpose," in Ikejiani, op. cit., pp. 20-21.

that if we examine our students internally standards will fall. 136

Two problems are raised by the above quotation. The first deals with those Africans who, under British colonialism, moved to westernized patterns of life and became detribalized, and who then formed a social status group oriented toward a British type of social structure. These people "provided a reservoir from which Africans were selected, recruited and rotated in important offices and duties in the colonial government." 137 This new social group was strongly oriented toward the British type of education, and strongly resisted any attempt to return to an emphasis on African education. Educated Nigerians protested such a move because (1) they preferred British education to the rural, tribal, vocational, vernacular, and moral instruction of African education, (2) the English school certificate represented one area of equality with whites, and (3) possession of the Cambridge School Certificate enabled Nigerians to enter foreign universities. 138

This leads us to the second of the problems implied by Okeke: the cult of the certificate. It is difficult for an American to understand the preoccupation of Nigerians with educational certificates, since these do not exist in the United States. In Nigeria, however, the certificate early became the passport to employment and the emblem of


prestige. Examinations for the certificates are a big business still controlled, to a great extent, by external examining bodies. What is needed if the certificate is still going to be the symbol of educational achievement, is the development of certifying bodies centered in Nigeria, possessing a Nigerian outlook, and serving the needs of Nigeria.\textsuperscript{139}

Problems and Needs in Primary Education

The elementary schools of Nigeria have been criticized as being wasteful of time and productivity, in that the first years are often devoted to amusement and entertainment, and the latter years to repeating some of the earlier work. What is called for is emphasis on English and vernacular languages, arithmetic skills, and science related to the environment.\textsuperscript{140} At that, there is an over-supply of primary school leavers in comparison with the educational output at other levels. The over-supply results because of the inability of the leavers to be absorbed either by employers or by post-primary schools.\textsuperscript{141} The imbalance in the educational pyramid was noted by the Ashby Commission which, in deciding on a pattern of education, was guided by the following principles:

1. It must produce enough children with post-secondary education to satisfy the nation's need for high-level manpower.
2. It must be properly balanced as between primary, secondary, and post-secondary education.
3. It must narrow the gap between educational opportunities in the North and the South, without producing an unbalanced system in the North.\textsuperscript{142}

\textsuperscript{139}Okeke, op. cit., p. 111.
\textsuperscript{140}Okechukwu Ikejiani, "Education for Efficiency," in Ikejiani, op. cit., pp. 89-90.
\textsuperscript{141}\textit{Ibid.}, p. 86. \textsuperscript{142}Investment in Education, op. cit., p. 10.
The primary schools do not train for agriculture or industry, but lead only to the secondary schools. However, steps are being taken to find places for primary school leavers. The secondary modern school is one answer, although at present, there are too few schools to absorb the over-supply. Another attempted solution is the placement of primary school leavers in agricultural communities, or farm settlements; they were supplied with machinery and government loans and settled in small village communities with some amenities. Although the program was started in 1960 in both Eastern and Western Nigeria, no definitive conclusions have yet been arrived at regarding the success of the experiment.

The principle of free primary education, while it is a matter of policy in all of Nigeria, has not been put into full practice because of the difficulty in financing such education. For instance, while the Eastern Region introduced eight years of free education, it was quickly forced to reduce this to four, then three years. Both Western and Northern Nigeria have had similar difficulties; only Lagos has been able to afford full free primary education. Even though education may be free, it is not compulsory, and many parents do not send their children to school. Others drop out before completing the full program, or have to cope with crowded classrooms, insufficient books and materials, incompetent teachers, or a tedious program.

The preparation of teachers is often inadequate. This is

---

143 Ikejiani, op. cit., p. 87.
144 Interview with Blankson. See Appendix B.
146 Equal Opportunity Through Education, op. cit., p. 149.
especially true for science. Not only is science not often a part of the curriculum, but even if it were, it would be almost impossible to teach since there are few books available in science, the schools have little in the way of equipment for science teaching, and the teachers themselves have little or no academic preparation in science, or professional preparation for teaching science.  

Despite these problems, plans have been made to increase instruction in fundamental and applied science at the primary level, and to bring mathematics and general science courses into closer relation with children's environment and experiences, as noted earlier. Also the 1961 White Paper, which was the government's response to the report of the Ashby Commission, stated that "The foundations of technological education must be laid in the primary schools if progress is to be assured."

For that reason, the Federal Government fully endorsed the proposal to make manual training and handicraft lessons an integral part of the elementary school curriculum.

Problems and Needs in Secondary Education

The Ashby Commission recommended that secondary school intake be increased from 12,000 in 1958 to over 30,000 by enlarging existing schools and by establishing new institutions. The 1961 White Paper envisioned an intake of not less than 45,000 by 1970. The Commission's recommendation for an annual intake of 3500 students in Sixth Forms was

---

147 Interviews with Abara, Modebe, Nwosu, and Sendze.

interpreted by the White Paper as calling for 350 new Sixth Form streams and a total of 10,000 students. The White Paper also agreed with the recommendations of the Ashby Commission with regard to (1) introduction of obligatory manual subjects in the secondary school, (2) an increase in vocational training, (3) an expansion of agricultural education in all schools, except in Lagos, (4) the building and equipping of more science laboratories, (5) and an increased availability of commercial education for girls in schools built and equipped for the purpose. The Federal Government also took the view, in the White Paper, that regional schools receiving federal support should offer education to all Nigerians, irrespective of regional origin.149

An important aim of the Federal Government is the establishment of National High Schools throughout the Federation; these would be federally financed inter-regional schools. The schools, besides constituting badly-needed new educational facilities, would serve two main purposes: (1) the achievement of national political unity and (2) the stimulation of developments in science and technology.150 Establishment of these schools was also recommended by the Ashby Commission.

In so far as sixth forms are a preparation for university work, said the Ashby Report, "their curriculum is bound to follow an academic pattern." Therefore, the Report added, it must include subjects which are fundamental to higher studies in the arts or sciences. However, the possibility of there being promising students who might not want to go

149 Ibid., pp. 1-2 and 5.
on to the university led the Commission to suggest the addition of some courses in pedagogy with teaching practice in order that these students might be enabled to enter the teaching profession.\textsuperscript{151} Following up this idea, Okeke called for scrapping the G.C.E. examination entirely and emphasizing terminal education in the higher schools, rather than preparation for university entrance. Said he, "Anybody who enters Higher School after the School Certificate course should go there for a definite programme that will prepare him for service to the nation."\textsuperscript{152}

Alexander, on the other hand, noting the growing concentration on science in the Sixth Forms, called for caution, lest there be an imbalance in educational output.

The choice of science subjects in the Sixth Forms of Nigerian schools may be immediately dictated by university entrance requirements, but it is, of course, finally related to expectation of employment. It may be that the country's need of doctors, engineers, agriculturists, and scientists of all kinds, including science teachers, is so great that the Sixth Form concentration upon science is justified, but the fact of this concentration should be noted and its results weighed.\textsuperscript{153}

Okeke also called for the elevation of commercial, secretarial, mechanical, technical, and scientific studies to the same point of prestige as grammar schools. According to him, science now commands prestige and respect simply because it is taught in grammar schools which are the most highly respected secondary schools.\textsuperscript{154} The answer, of course, lies in the comprehensive school, which combines academic and

\textsuperscript{151} Investment in Education, op. cit., p. 13.
\textsuperscript{152} Okeke, op. cit., p. 109.
\textsuperscript{153} Alexander, op. cit., p. 11.
\textsuperscript{154} Okeke, op. cit., p. 112.
technical or vocational training.  

Undoubtedly, one of the greatest needs in secondary education is for technically competent teachers, especially in sciences and mathematics, engineering and technical subjects, English, French, and geography. The greatest numbers of graduate teachers are needed in secondary grammar schools and teacher training colleges; few are employed in secondary modern and commercial schools and virtually none in primary schools. In the secondary grammar schools, there is a great need for science and mathematics teachers; the same need exists in teacher training institutions which also require a knowledge of teaching methods. Technical institutions need graduate teachers in technical, science, engineering, and arts subjects. (Universities have needs in all fields, including education and the sciences.)

Secondary school science teachers have been criticized, to some extent, for their sub-standard preparation, both academic and professional. The Ashby Commission criticized the system whereby Grade II teachers had to lift themselves by their own efforts into Grade I, and called instead for formal two-year courses for such upgrading, which would take place in (1) teacher training colleges for primary teachers, (2) departments of teacher training in technical institutes, for teachers of technical subjects, mathematics, and science, and (3) additional Sixth Form streams combined with teacher training for those preparing

---

155. Hanson, Education for Efficiency, op. cit., p. 91.
for secondary school teaching. 158

Although laboratory facilities are considered adequate, especially in Sixth Forms, there appears to be some shortage of equipment; this is particularly true for the teaching of biology. In general, government schools are better equipped for the teaching of science than are mission schools. Some Nigerians who have had their secondary education in their own country feel that there was not sufficient emphasis on student experimentation; those experiments which were performed were more often of the "cook-book" variety than open-ended. The classes were too often of the lecture type with an emphasis on memorization; it was felt that the approach to teaching should be changed in order to enable students to participate in the learning process more than they do at present. 159

Most textbooks used in secondary education have been identical with those used in Britain; many are out of date, particularly in science. However, steps are being taken to update textbooks and to relate them more closely to the Nigerian and African environment. In addition, syllabuses in secondary school science and in technical subjects are being adapted in such a manner as to bring them into closer relation with the real-life experiences of the students. 160

Problems and Needs in Higher Education

Ikejiani noted the lack of balance in Nigerian education between

---

158. Investment in Education, op. cit., p. 16.
159. Interviews with Abara, Modebe, Nwosu, and Sendze.
160. Ibid. Also, interviews with Aloba and Blankson.
161. Ikejiani, Education for Efficiency, op. cit., p. 86.
the humanities and the sciences; a few weeks before he was assassinated, Major-General Aguiyi-Ironsi, Head of the National Military Government, called attention to the disparity between policy and practice with regard to balancing the output of students from Nigerian universities.

The present distribution of students between the two broad disciplines labelled 'Humanities' and 'Science' is not satisfactory and does not accord with our national needs. For example, in the session 1965-66, some 4,214 students are registered for degrees in Arts and Social Science and 3,313 in Pure and Applied Sciences, or in terms of percentages 56 for Humanities and 44 for Science. This is clearly not in keeping with the policy for higher education laid down for our Universities that for every 100 students admitted 60 should be taking courses in Pure and Applied Sciences and 40 in Humanities.

In addition, Aguiyi-Ironsi scored the universities for excessive duplication, instead of complementation, of courses, and for emphasis on size of student intake rather than on size and quality of output. He warned that, if this situation were allowed to continue, Nigeria would never meet her requirements for technicians and science graduates. In hopes of avoiding such a situation, the Head appointed a Working Party, consisting of all the Vice-Chancellors, to examine the problems and make recommendations.

Although the Ashby Commission set a figure of 7,500 student-places in Nigerian universities, the 1961 White Paper foresaw a total enrollment of 10,000 students in all the universities in Nigeria by 1970, as a minimum target. In addition, the federal government was strongly


163 Ibid., p. 3.

of the view that technological studies, agricultural education, the training of teachers for institutions below university level, and the study of economics and commercial subjects should take place at each of the universities in the nation. Also, the government hoped to see the Research Institute of Veterinary Science at Vom develop into a Faculty of Veterinary Science of the University of Northern Nigeria and serve to supply the entire Federation with graduate veterinary scientists. To dispel the fears of the traditionally-educated elite regarding the opening of the universities to non-classical education, Okeke states that: "We must open the doors of our universities to the many. To educate our youth for what we need is not lowering our standards."

The Ashby Commission projected a need for 500 research scientists (in the high-level manpower category) to be produced in Nigerian universities between 1960 and 1970, aside from numbers needed for other purposes. Scientific research in Nigeria is carried out by three types of organizations: (1) government departments organized by federal and regional ministries, (2) research institutes organized by federal and regional governments, and (3) universities, of which all five have faculties of science engaged in teaching and research, four have faculties of agriculture, two have medical schools, and three have faculties of engineering, all of which have staff engaged in research. The national science policy is faced with the problem of striking a balance

---


166 Okeke, op. cit., p. 109.

between fundamental and applied research and of finding a balance be-
tween research and other developmental activities.  

Other Problems and Needs in Nigerian Education

Probably the most urgent educational problem in contemporary Ni-
ergia is not directly an educational one, but rather a political prob-
lem. The differences between North and South, and between the several
Regions are due to geography, tribal ethnics, language, religion, and
cultural and educational rivalries. These differences have led to
several violent upheavals which have resulted successively in dissolu-
tion of the Regions, dissolution of the Republic of Nigeria and res-
toration of the Federation, and secession of Eastern Nigeria. Attempts
to seek unification of purpose, with regard to education, have included
establishment of National High Schools, organization of the universities
in such a manner as to avoid duplication and serve the needs of the en-
tire country, and exercise of some degree of federal control over educa-
tion in the various regions through legislation and financing.

The problems which have been touched upon earlier include (1)
teacher shortages and quality of teachers, (2) in-service education and
training of teachers, (3) shortages of equipment, laboratories, and other
facilities for scientific, technical, and vocational education, (4)
shortages of school buildings, at all levels, (5) needs in books, (6)

169 See "Africa: Birth of a Continent," by Arnold Toynbee, in
Saturday Review (December 5, 1964), p. 29.
170 See Broadcast to the Nation, etc., op. cit., p. 3.
problems in language, and (7) problems in Koranic education. The problem of financing education and the developments in construction and expansion will be discussed in a later chapter.

Summary

Nigeria is a country which, considering the wealth of population, the numbers of its educated people—including those with university experience—and the relatively good preparation for independence which it received during the closing years of the colonial period, should have made the greatest progress toward national development of all recently independent nations of Africa. It may be that Nigeria is leading Africa in this respect, but this pioneering role has been marred by internal dissension and perhaps has been retarded or lessened in degree.

Notwithstanding its internal political difficulties, Nigeria has shown remarkable progress in the development of education. This has been due to a great extent to the tremendous interest in education as a tool of national development, starting with the colonial investigations of education and culminating in the magnificent Report of the Commission on Post-School Certificate and Higher Education in Nigeria and in similar reports of educational commissions in each of the Regions.

A major problem has been to revise the educational pyramid, such that primary education would provide a broad base, with narrowing steps for each of the succeeding educational levels. This means that Northern Nigeria must broaden its primary school base, for otherwise there would be an insufficient input to the other levels. In the other Regions, it is secondary and Sixth Form education which need emphasis.
At all levels, there is a need for strengthening the curriculum in science and in related areas, such as mathematics and technical and manual skills. Concomitantly, teachers need strengthening in their own scientific backgrounds and in their abilities to make science meaningful to their students.

The major problem in implementing educational schemes for national development is one of finance. Virtually all of the educational problems, such as construction of school buildings, equipping of laboratories, provision of textbooks and other educational materials, and training of teachers, cause a heavy drain on the financial resources of the country. That the government appreciates the valuable role of education in the development of the country is indicated by the large proportion of the budget which is devoted to educational purposes.

If Nigeria can solve its internal political difficulties, there is perhaps no limit to the educational progress which can be made. It may be that dissolution of the federation would enable each area to proceed peacefully toward its goals; on the other hand, a strong federation can offer much to those areas which need encouragement and concrete assistance. We might well consider how much lower Northern Nigeria's educational status might be were it not for the jealousy which goads that Region into seeking educational and financial parity with the Eastern Region. It is indeed paradoxical that those factors which are causing internal dissension are the very same which are leading to various kinds of progress. Perhaps, given time, Nigeria's leaders will come to see that differences can lead to the strength of a nation, instead of acting to disrupt the steady progress of national development.
CHAPTER IV

EDUCATION IN CAMEROON

The Federal Republic of Cameroon (or officially, République Féderale du Cameroun) has an area of 183,569 square miles and a population of about five million people.¹ With a population density about one-seventh that of Nigeria, the problem of educating its people would perhaps be more difficult to solve. Cameroon is about 700 miles long, approximately the size of California, and is bounded on the south by Spanish Guinea, Gabon and Brazzaville Congo, on the east by Chad and the Central African Republic, and on the west by Nigeria and the Bight of Biafra.²

About the sixth century B.C., the Carthaginian Hanno sailed into the Bight of Biafra, where he beheld volcanic eruptions on Mount Cameroon and on the island of Fernando Po. About the tenth century A.D., the Sao people from the north settled on Lake Tchad and in the Northern Cameroon. In the fifteenth century, Sudanese from Abyssinia and the eastern Sudan populated the Northern Cameroon; at the same time, the Bantu (Bamileke, Banen and Bassa) populated the central plateau. A later wave of Bantu (Douala) moved in from the south in the seventeenth century.

¹Africa, op. cit., p. 93, gives a population of 4,346,000; Readers Digest Almanac 1966, op. cit., p. 737, gives a population of 5,008,000; both figures are as of 1965.

In 1472, Portuguese sailors led by Fernando Po came to the island which was named for him and sailed into the estuary now known as the Wouri River, near the site of modern Douala. They named the river Rio dos Camerões (camerones in Spanish), after the shrimp which they found in abundance there. Engaging in trade with the Douala kings, the Portuguese expanded their relations into the much more profitable slave trade, with Spanish, French, British, American, and German traders later competing for a share of the market. British anti-slavery sentiment led to the signing of contracts, first in 1840 with the kings of Douala, and later with other kings, outlawing the slave trade. Many nations were attempting to extend their influence in the Cameroons, but just before the British could conclude treaties of annexation with the kings at Douala, a German emissary signed a treaty with them establishing the area as a German protectorate in 1884.3

In 1885, the German governor at Douala began to organize expeditions which gradually established control over the interior. German settlers moved into the highland areas near the coast; this resulted eventually in the removal of English missionaries, who were expelled because of their influence over the natives, who objected strongly to having their land stolen and to being conscripted for labor. German domination over the Cameroons continued to grow until the advent of World War I.4 Following the Treaty of Versailles on June 28, 1919, Germany renounced its rights to the German Protectorate of Kamerun; on July 10,


1919, a Franco-British declaration divided Kamerun into two parts; on July 20, 1919, France received the mandate to administer the eastern part and England received the mandate to administer the western part. This political division of Kamerun had far-reaching consequences, not only political, social, cultural, and economic, but also on the educational structure and development of the respective parts.5

With the demise of the League of Nations, which had sanctioned the original mandates, the two areas became trust territories under the trusteeship system of the United Nations in 1946. Under its new status, the Cameroons began a more democratic life. The French Cameroons was given a voice in France's National Assembly and was allowed to establish a local assembly.6 Between 1946 and 1958, the local populations in each of the territories of French Equatorial Africa and in the trust territories of French Cameroons and Togo gradually assumed a larger measure of responsibility for self-government, culminating in full internal autonomy in 1958 with the establishment of the Fifth Republic and the French Community. In 1960, all six territories achieved final independence, with Cameroon doing so on January 1, 1960.7

Plebiscites to determine the future of British Cameroons were recommended by the General Assembly of the United Nations in 1959. The Assembly decided that separate plebiscites should be held in the northern and southern sections of the territory. The first plebiscite in the

5Bal5 Bala and Lagrange, op. cit., p. 163.


north took place on November 7, 1959, but the results were indecisive; in February 1961, a new plebiscite decided that the Northern Cameroons would become part of Nigeria, which it did on June 1, 1961. The plebiscite in the south, also in February 1961, decided that the Southern Cameroons would join the Cameroun Republic; on October 1, 1961, the two areas merged to become the Federal Republic of Cameroon.

The two members of the federation are now known as Eastern Cameroun and Western Cameroon. The political and cultural differences between the two states were such as to dictate federation rather than mere unification. As stated in an official government manual of civic instruction and social education:

One part of old Cameroun was placed under British mandate, then trust. It is British administration which has guided its affairs; it is the English language which has served for administration, politics, education; it is English money which has been used for its finances and trade, which has been almost entirely with Great Britain.

Similarly, France has fashioned the territory which has been entrusted to it. The Camerounian administration has patterned itself after the French government. The French language is the usual tongue of the federal state of Eastern Cameroun.

Under these circumstances, the two parts of Cameroon have become very different from one another. Therefore, it appeared necessary for each to conserve its own individuality. But, for important questions, they are united; they are federated; they have therefore created a common organization: The Federal Republic of Cameroon.

The southern and northern sections of Eastern Cameroun differ in many respects. The north is largely rural while the south contains most

---


9 Bala and Lagrave, op. cit., pp. 165-166. Translated from the French by this writer.
of the urban areas; the north has a much higher percentage of Moslems, while the south is mostly Christian (especially in the cities) and animistic (in the rural areas). Between five and ten per cent of the total population is estimated to be literate in French, but in the urban areas of the south, the figure is much higher—perhaps thirty to forty per cent.\textsuperscript{10} There are Fulani, Bamileke, and Fang in the north, and Tiv and Beti in the south.\textsuperscript{11} In the West Cameroon there are Tikar and related peoples in the grassland areas, and Ibos, Bakweri and Bakundu along the coast.\textsuperscript{12}

The multiplicity of languages among the more than 80 tribal groups has led to the use of "Wes-kos," a pidgin-English much used along the west coast of Africa.\textsuperscript{13} Pidgin-English received a strong impetus to growth when religious materials for use in the Nkongsamba Diocese were written in the 1920's. Pidgin-English is still being used for ecclesiastical purposes, perhaps even more so for commercial purposes, and finds wide use by the press and radio for purposes of communication with certain segments of the population.\textsuperscript{14}

Federation of the two states led to constitutional provision that the official languages be French and English. The need for communication between the states has necessitated a growth of bilingualism in

\begin{itemize}
\item \textsuperscript{10}Kitchen, \textit{The Educated African}, p. 230.
\item \textsuperscript{11}Sasnett and Sepmeyer, \textit{op. cit.}, p. 626.
\item \textsuperscript{12}Kitchen, \textit{A Handbook of African Affairs}, p. 19.
\item \textsuperscript{13}\textit{Ibid.}, p. 18.
\item \textsuperscript{14}J.A. Kisob, "A Live Language: Pidgin English," \textit{Abbia (Cameroon Cultural Review)}, I (February, 1965), pp. 28-30.
\end{itemize}
governmental circles. Thus, civil servants are faced with the problem of learning a third language after the native vernacular and the official language most in use in their own states. It is not surprising, then, to find pidgin-English much in use in government circles. In Western Cameroon, where British culture and tradition have taken root, the government has relegated the teaching of French to the secondary school, where students may not be exposed to the language until after they have secured a firm foundation in the English language in the primary school. Yet, the government is strongly in favor of bilingualism as a unifying force in the nation. Similarly, English is an obligatory subject in the secondary schools of Eastern Cameroun; although German and Spanish are offered, they may only be taken as second modern languages. The reason for English language teaching is not only that it is one of the official languages, but that most of the scholarships for higher studies are offered in the United States.

**Early Development of Education**

In January 1841, the London Baptist Mission began activities in Cameroon, followed by Presbyterian missionaries in 1885 and Catholic missionaries in 1890. Protestant missions were dominant during German

---


rule, but Catholic influence grew rapidly after French domination. 19

Until the establishment of the German Protectorate in 1884, the only western type schools in the Cameroons were those introduced by missionaries during the preceding forty years. During the next thirty years, only four public schools were established. 20 While the Germans had no objection to education for Africans, they did almost nothing to encourage it. Indeed, some few Cameroonians were able to acquire a smattering of German and some small ability with numbers; these were usually natives who served the colonial administration in some minor capacity. 21 German policy was to train clerks to assist the administration and the trading firms and to give instruction in farming; mission schools, while doing the same, laid more emphasis on Bible instruction and preparing teachers and catechists. In 1913, the four German government schools (at Douala, Victoria, Yaoundé, and Garoua) had a total school population of 833, while the 631 mission schools (operated by the Baptist Mission, American Presbyterians, German Catholics, and the Basel Mission) had a total of 40,063 students. It seems obvious that the number of Cameroonians literate in German was too small for German language and culture to have a lasting effect in the Cameroons. 22

After World War I, French missionaries started to replace those


21. Personal interview with Sadrack Eric Njomou of Cameroon, at the Ohio State University, June 12, 1964.

22. Kisob, op. cit., p. 27.
of Germany. By 1924, the missionary educational system in the Cameroons was one of the most impressive in Africa. American Presbyterians alone had, in eleven years, sextupled the number of their schools to 595 and almost quadrupled the number of students to about 25,000.23

One of the first acts of the French colonial government following World War I was to attempt to limit instruction in private schools exclusively to a prescribed course and only in French. This arrêté proved to be unenforceable, and village schools were exempted from it. These schools were allowed to continue teaching in the local vernacular, while government schools taught only in French.24

The French system of education, with instruction and certification patterned after the system followed in metropolitan France, was introduced in 1921.25 The colonial administration granted subsidies to mission schools, but only to those which taught in French and followed the course of study prescribed for government schools. By 1925, there were 6,122 students in recognized (i.e., teaching in French) mission schools, 4,631 in government schools, and 44,415 in unrecognized (i.e., teaching in the vernacular and not following the French system of education) mission schools, for a total of 55,168 students. This represented some 20,000 more Africans undergoing some form of education than in the whole of French West Africa.26

24Ibid., pp. 354-356.
25Sasnett and Sepneyer, op. cit., p. 627.
Recent Educational History and Structure

Private education, both religious and secular, occupies an important place in Cameroonian education even today. Despite tremendous expansion of government schools under the French administration and since independence, private education accounts today for 60% of primary education and about 45% of secondary education. Under the impetus provided by mission education, Eastern Cameroun ranks quite high in French-speaking Africa in terms of the percentage of school-age children in school. While the proportion of children going to school in French West Africa was about five or six per cent, that in Eastern Cameroun was about 25%. In the fifteen years since the end of World War II, the total enrollment has tripled, the percentage of girls in school has doubled, and the percentage of school-age children in attendance has risen to 63%. However, the rate of school attendance for boys ranges from nearly 100% in the urban south to 36% in the Moslem north; the rate of attendance for girls is 27% in the south and 2% in the north.

Because of the linguistic differences, the two school systems exist in the Federation—the British system with English as the language of instruction in West Cameroon, and the French system with French as the language of instruction in East Cameroon. However, the gradual introduction of a bilingual educational system is planned.

---

Secretary of State for Education in each of the states is responsible for primary education and lower secondary education. Upper secondary education, technical education, and higher education in both states are the responsibility of the Ministry of National Education.\footnote{31}

In West Cameroon, education follows a thirteen-year pattern—eight years of primary school, divided into the four-year junior primary and the four-year senior primary, and five years of secondary school. There are no facilities for higher education, but eligible students have been able to attend Nigerian institutions of higher education.\footnote{32} In East Cameroun, education also follows a thirteen-year pattern, with six years of elementary education and seven years of secondary education.\footnote{33} Since 1962, higher education has been available at the Federal University of Cameroon.\footnote{34}

**Primary Education**

**East Cameroun**

Under the French-administered educational system, all children attended primary school for six years. The period is divided into three two-year levels or courses: preparatory, elementary, and middle (\textit{cours préparatoire}, \textit{cours élémentaire}, and \textit{cours moyen}). In East Cameroun, the first stage is sub-divided into the introductory division (\textit{section introductive}).

\footnote{31}{Bala and Lagrange, \textit{op. cit.}, pp. 210-211.}
\footnote{32}{LeVine, \textit{op. cit.}, pp. 304-305.}
\footnote{33}{Sasnett and Sepmeyer, \textit{op. cit.}, p. 625.}
\footnote{34}{\textit{Ibid.}, p. 631.}
d'initiation) and the preparatory stage (cours préparatoire). 35

Although it is possible to enroll in nursery school at age three, formal education begins at age six. The six-year primary curriculum includes morals, reading, writing, French, arithmetic, history, geography, manual work, art, singing, physical education and agricultural work; the medium of instruction is French. 36 Completion of primary education leads to the certificat d'études primaires élémentaires (C.E.P.E.). The best students may be admitted to secondary schools upon passing the secondary school entrance examination (concours d'entrée en classe de sixième), or to technical schools. 37 For those who wish post-primary education but have not been able to gain admittance to a secondary or technical school there are sections pratiques de fin d'études, two-year courses which concentrate on agriculture and village life. 38

In 1961, there were 102,000 students enrolled in 728 government primary schools, and 228,983 students in 2013 voluntary agency schools, for a total of 330,393 students. (West Cameroon had, in 1958, 10,414 students in 71 government schools, and 50,490 students in 433 voluntary agency schools, for a total enrollment of 60,904 students in 454 schools.) 39 By 1962, there were 151,635 primary students in government schools in both states, and 275,494 in voluntary agency schools, for a

36 Sasnett and Sepmeyer, op. cit., p. 628.
38 Sasnett and Sepmeyer, loc. cit.
total of 427,129 primary students in the federation.\textsuperscript{40}

West Cameroon

Following the British system of education, primary education in West Cameroon consists of an eight-year course, divided into junior primary (consisting of Infants I-II and Standards I-II) and senior primary (consisting of Standards III-VI).\textsuperscript{41} This would correspond to the six years of primary education plus the first two years of secondary education in England. Those who complete the course and pass the Standard VI examination receive the First School Leaving Certificate (as in Nigeria) which leads to entry into post-primary education or serves as a minimum qualification for many salaried positions in government and industry.\textsuperscript{42}

Science Education

Such science as is taught in the primary school is largely descriptive and simple. It is concerned with health, the human body and its functions, and knowledge of some plants and animals. Aside from the practical knowledge gained from experiences on the school farm, the depth of scientific studies is in no way comparable to that which is common to a good elementary school science program in the United States.\textsuperscript{43} Although Bala claims that science appears in the primary school curriculum, this writer has not found evidence of this in the available

\textsuperscript{40}Bala and Lagrave, \textit{op. cit.}, p. 210.

\textsuperscript{41}\textit{International Yearbook of Education, loc. cit.}

\textsuperscript{42}Kitchen, \textit{op. cit.}, pp. 527-528.

\textsuperscript{43}Interview with Njomou.
literature. However, within the past three years (i.e., since 1964) a new syllabus in primary science has been issued. Whether the program has been put into effect in most schools is not known to this writer.

Interviewees from East and West Cameroon (and from Togo, whose political and educational history closely parallels that of East Cameroun) are virtually unanimous in their criticism of the status of science teaching in the primary schools. These criticisms are three-fold: (1) science teaching is inadequate; that is, there is neither sufficient content nor sufficient time devoted to the teaching of science; (2) teachers are inadequate to the task of teaching science because their own science backgrounds are inadequate; and (3) the teaching of science would be enhanced by the availability of science textbooks, which are badly needed.

Secondary Education

East Cameroun

Secondary education in East Cameroun has virtually the same structure as that of France. The seven-year program is numbered backward from VI to I and terminal class; sixième and cinquième are transition classes (cycle d'observation) as in France; quatrième and troisième complete the general education (cycle d'enseignement général moyen) and

---

44 Bala and Lagrave, loc. cit.
46 Interviews with Njomou and Sendze, also with Nicholas Amouzou Adankpoh of Togo, at the Ohio State University, July 17, 1964, also with Edouard-Raphael Placca of Togo, at the Ohio State University, October 25, 1964.
signify the end of the shorter four-year course of general education (cours complémentaire); seconde, première and terminale constitute the upper level of secondary education which involves the study of major subjects and leads to the baccalauréat. 47

As in the primary school, the rate of attrition in the secondary school is very high. Very few students, of those entering the secondary school, attain the baccalauréat. To counteract this high drop-out rate, many French-speaking nations have introduced cours complémentaires, comprising the first four years of secondary school. This terminal course, leading to the brevet élémentaire du premier cycle (B.E.P.C.), permits those who are qualified and able to go on to the fifth year of secondary school (and to completion of the course for the baccalauréat) or to take positions which require some education beyond the primary school. One of the purposes of the cours complémentaires, from an administrative point of view, is to decentralize secondary education and thus to make it available over a more widespread geographical area. However, the scarcity of qualified teachers renders the program generally sub-standard, and graduates sometimes find it difficult to cope with the requirements of the fifth year in an up-to-date centralized secondary school. Nevertheless, with the introduction of the cours complémentaires, school attendance has more than doubled in some areas in less than five years. 48 This course is administered by the Secretary of State for Education in East Cameroun. 49 The curriculum for this terminal education

47 Sasnett and Sepmeyer, op. cit., p. 625.
48 Kitchen, op. cit., passim.
49 Bala and Lagrave, op. cit., p. 217.
includes French, civics, history, geography, mathematics, drawing, practical sciences, music, education, home economics, and manual training. Very little time is devoted to the study of natural sciences, if any.\textsuperscript{50}

The seven-year academic course leading to the \textit{baccalauréat} comes directly under the Ministry of National Education, and is given at five \textit{lycées} and seventeen \textit{collèges d'enseignement général} (C.E.G.) in East Cameroun. Besides these government schools, there are sixty-two private secondary academic establishments.\textsuperscript{51} In 1962, government schools enrolled 5,975 students and voluntary agencies enrolled 12,412, for a total of 18,387 secondary school students.\textsuperscript{52} The curricular content is similar to that of the French secondary school system, with similar emphasis in specialized fields during the last three years. The majority of those successfully attaining the \textit{baccalauréat} are awarded scholarships for study in French universities.\textsuperscript{53}

The B.E.P.C., awarded after the \textit{cours complémentaire}, is a Cameroonian diploma countersigned by the Inspecteur d'Académie representing the Académie of Bordeaux who is stationed in Yaoundé. Both parts of the \textit{baccalauréat}, (\textit{examen probatoire} and \textit{baccalauréat}) are identical with the examinations given in France and are administered directly from Bordeaux.\textsuperscript{54}

Some idea of the expansion of secondary education in East Cameroun may be gathered from the following notes translated from a letter

\textsuperscript{50}Kitchen, \textit{op. cit.}, p. 523.
\textsuperscript{51}Bala and Lagrave, \textit{op. cit.}, pp. 211-212 and 217.
\textsuperscript{52}LeVine, \textit{loc. cit.} \textsuperscript{53}Kitchen, \textit{loc. cit.}
\textsuperscript{54}Sasnett and Sepmeyer, \textit{op. cit.}, pp. 630-631.
received from the Minister of Education of the Federal Republic of the Cameroon.

Creation of a high school for girls at Douala, planned February 7, 1942 (collège moderne for young girls in 1946, lycée in 1960)

Creation of a course in secondary education at Yaoundé, planned July 24, 1944 (transformed into a lycée by the ministerial order of August 28, 1950)

Opening of cours complémentaires, annexed to certain primary schools, planned December 20, 1951

In 1948, only one cours complémentaire existed in the Cameroon, that of Garoua (transformed into collège moderne in 1953, into lycée in 1960)

The cours complémentaire of Bertoua, created in 1952, has been transformed into Ecole Normale d'Instituteurs-Adjoint in 1953

From 1953 to 1956, the following progress is noted:

1953—five cours complémentaires (Dschang, Foumban, Ebolowa, Yaoundé, Douala)

1954—the cours complémentaires of Dschang, Foumban, Ebolowa are transformed into Ecoles Normales d'Instituteurs-Adjoint

1955—opening of the cours complémentaires for Yaoundé girls, Abong-Mbang, Bafia, Kribi, Sangmélima

In 1960, these cours complémentaires were raised to collèges d'enseignement général

Creation of a classical and modern collège at Douala (Joss) in 1953 (lycée since 1960)

The collège moderne of Nkongsamba (which was in existence in 1948) was likewise transformed into a lycée on the same date

Collèges d'enseignement général were created at Ngaoundéré in October 1962, at Bangtangté in October 1963

At the beginning of the school year in 1963, the collège d'enseignement of Bafoussam was transformed into a lycée 56

An indication of the growth of secondary education may also be gathered from a comparison of examination statistics of the years 1951 and 1962. In 1951, of 1079 taking the secondary school entrance examination, 409 were admitted; in 1962, 2,124 out of 11,683 were admitted.

55 Normal School for Assistant Teachers.

(The number of admittees were limited by the number of available places in the secondary schools.) At the end of the *cours complémentaire*, 9 of 20 passed the *brevet élémentaire* (B.E.) and 119 of 210 passed the B.E.P. C. in 1951; in 1962, 341 out of 1052 passed the B.E. and 642 out of 3715 passed the B.E.P.C. In 1951, 28 of 61 passed the first part of the *baccalauréat* and 15 of 39 passed the second part; in 1962, 240 of 622 passed the first part and 122 of 205 passed the second part.57

**West Cameroon**

Secondary education in West Cameroon is a five-year course consisting of Forms I-V.58 There are only three full secondary schools in the state: St. Joseph's College at Sasse, a boys' school which also offers a sixth year—lower Sixth Form; Cameroons Protestant College at Bali, also a boys' school; and Queen of the Holy Rosary College for girls at Okoyong. Besides these institutions, there are Sacred Heart College at Malkon, which enrolled 90 students in Forms I-II in 1962; Saker Baptist College for girls at Victoria, which enrolled 36 students in Form I in 1962; and the government institution, the College of Arts and Sciences at Kumba, which enrolled 51 students in lower Form VI in 1962.59

The total secondary enrollment was 923 in 1962; this was one-twentieth of the enrollment in East Cameroun, although West Cameroon has one-fourth of the total population.60

58 International Yearbook of Education, loc. cit.
59 Statistiques, etc., op. cit., p. 70.
60 LeVine, loc. cit.
The curriculum prepares students to sit for the W.A.S.C., and includes English language and literature, mathematics, science, history and geography. English is the medium of instruction and French is offered as a second language. 61

In September 1963, the Federal Bilingual Grammar School opened temporarily in Victoria and transferred to its permanent site at Buea in 1964. The experimental school employs a faculty of Cameroonian, French, and British nationals, and is an attempt at bilingualism in practice, with students coming from all areas of the federation. 62 The school was made possible by the European Development Fund. 63

Two important developments in secondary education are taking place: (1) Secondary schools are being restricted to a five-year curriculum in order to ensure the success of the new College of Arts and Science, which will offer only higher secondary education, and to guarantee a concentrated effort for advanced level secondary education; (2) The government is considering the possibility of introducing a type of secondary modern school which will combine general education with commercial education. 64

Science Education

Science education in the secondary schools of East Cameroun follows very closely the pattern of such education in France, with some

---

61 Kitchen, op. cit., p. 528.
62 West Cameroon Educational Policy, op. cit., p. 338.
63 International Yearbook of Education, op. cit., p. 56.
64 West Cameroon Educational Policy, op. cit., p. 339.
very important limitations. In the first four years of secondary school, all students study general science, which involves topics from each of the natural sciences. In the final three years, the students select their respective areas of specialization, as in France. Those who enter mathématiques élémentaire emphasize the study of mathematics and physics, with some other sciences; those who enter sciences expérimentales study physics, biology, and chemistry. It is interesting to note that, of the 205 students sitting for the second part of the baccalauréat at Yaoundé and Douala in 1962, 37% took their examinations in philosophie, 33% in sciences expérimentales, and 30% in mathématiques élémentaire. It is possible that these figures indicate a trend toward the study of the sciences and away from classical learning.

While almost identical with the French system in form, the East Cameroun system of science education suffers from many deficiencies not present in French schools. Two such shortcomings are (1) the limited opportunity for student experimentation and (2) the emphasis on memorization. Although these problems stem from differing causes, one influences the other; that is, the emphasis on memorization tends to de-emphasize student experimentation, and the lack of student experimentation serves to make memorization the sine qua non of science education not only in East Cameroun, but in most of French-speaking Africa.

It is a matter of common agreement that the chief reason for the emphasis on memorization in science education is the universal requirement

---

65 Interviews with Hérault and Njomou. See also Sasnett and Sepmeyer, op. cit., pp. 628-630.
66 Statistiques, etc., op. cit., p. 59.
that students pass examinations at each rung of the educational ladder; indeed, this is a world-wide problem common to all examination-oriented educational systems rather than a problem exclusively for Africans.

The causes underlying the paucity of student experimentation are much more evident and easily stated. First of all, the shortage of funds, facilities and equipment make teacher demonstration difficult, let alone student experimentation. Secondly, native teachers, being themselves products of the educational system, do not have familiarity with materials and techniques for either demonstration or experimentation, and thus tend to perpetuate the very system within which they had their own science educational experiences. Although many secondary school science teachers in Cameroon (and in other African nations) are expatriate, and have had good laboratory experiences in their native countries, they are often defeated by the negative conditions which they meet when they come to teach in Africa.

In West Cameroon, science education follows the British (or more exactly, the Nigerian) system of general science in the early secondary years, with greater specialization in the sciences in the upper years. However, until recently, there were no Sixth Forms in West Cameroon, and the facilities needed for Sixth Form science work were therefore entirely lacking; for lower form science work, facilities for student experimentation were almost negligible. Here, too, the emphasis was on memorization for the W.A.S.C.

Although textbooks appear to be in adequate supply, many of them have been translated from German texts or are the identical texts used in

---

67 As noted earlier, there were only 55 students in lower and
French and British schools. These texts tend to be somewhat inadequate in that they are oriented toward British and French culture; in the case of science texts, they are more concerned with the flora and fauna of France and Britain than with those of Africa and the Cameroons. This situation appears to be generally true in other English-speaking and French-speaking African nations as well. In recent years, in line with the aim of adapting education to the Cameroonian and African context, textbooks are being written or adapted from those in current use.

It is to be hoped that, with the establishment or enlargement of nine secondary schools in Eastern Cameroun in 1963 (with the aid of the European Development Fund), and with the opening of the College of Arts and Sciences in 1962 and Basel Mission College and the Federal Bilingual High School in West Cameroon in 1963, the facilities for improved teaching of science will serve to raise the quality of science education in both states of Cameroon.

Higher Education

The first institution of higher education in Cameroon was the Cameroon School of Administration, which was established in 1959. This was followed by the National Agricultural College in 1960, the Higher in upper Sixth Forms in 1962 in West Cameroon.

68 Interviews with Adankpoh, Njomou, Placca, and Sendze.


70 International Yearbook of Education, loc. cit.; also, Statistiques, etc., op. cit., p. 70.
Teacher Training Institute in 1961, and the National Institute of Higher Studies which opened during the academic year 1961-62. The Federal University of Cameroon replaced the National Institute and grouped all of the public institutions of learning, with the exception of the Cameroon School of Administration, in 1962.\(^7^1\)

The Federal University of Cameroon (l'Université Fédérale du Cameroun) was created by decree of July 26, 1962 at Yaoundé in East Cameroon. The inaugural year of 1962-63 opened with 490 students in the Faculty of Law and Economics (Faculté de Droit et Sciences Economiques), 18 in the Faculty of Arts and Sociology (Faculté des Lettres et Sciences Humaines), and 18 in the Faculty of Sciences (Faculté des Sciences). In addition there were 46 students in the Higher Normal School (Ecole Normale Supérieure) and 16 in the Higher Federal School of Agriculture (Ecole Fédérale Supérieure d'Agriculture) associated with the University.\(^7^2\)

The Faculty of Science offers courses in animal biology, plant biology, geology, physics, chemistry, and mathematics. Completion of the course is signified by passing the examination for the certificate of higher scientific studies (certificat d'études supérieures de sciences physiques, chimiques et naturelles, or SPCN). The Higher Federal School of Agriculture offers a four-year course leading to the diploma in agricultural engineering (diplôme d'ingénieur agronome). The Higher Normal School has two sections: (1) The first prepares teachers for the lower cycle of secondary school, and (2) the second prepares primary school teachers.

\(^7^1\)World Survey of Education, op. cit., p. 271.

\(^7^2\)Statistiques, etc., op. cit., p. 75; also L'Université Fédérale du Cameroun, op. cit., pp. 6 and 30.
inspectors and teachers for the normal schools which prepare primary school teachers (instituteurs-adjoints). 73

The Cameroon School of Administration (L'Ecole Camerounaise d'Administration) at Yaoundé offers a two- or three-year course for civil servants and others leading to the school diploma (diplôme de l'école Camerounaise d'administration). There are also a National Sports Institute (Institut National des Sports) which prepares teachers and professors of physical education, and a military college (Ecole Militaire Interarmes) for military personnel; both are at Yaoundé. 74

There are no institutions of higher education in West Cameroon. Students have had access to Nigerian universities on a scholarship basis and also to American and British universities. 75 The plan of the West Cameroon government is to extend the College of Arts and Science—which has only lower Sixth Form classes at present—in breadth by the addition of technological courses and in length by development into a decentralized branch of the Federal University at Yaoundé. The United States government is assisting in bringing these plans to fruition. 76

Although it appears, judging from the enrollment statistics, that not too many students at the Federal University are interested in careers in science, there is actually a trend away from the traditional emphasis on letters, medicine, and law, and toward the sciences. This is

73 Sasnett and Sepmeyer, op. cit., pp. 633 and 636; also Statistiques, etc., loc. cit.
74 Sasnett and Sepmeyer, op. cit., p. 634.
75 Kitchen, op. cit., p. 529.
76 West Cameroon Education Policy, op. cit., p. 341.
corroborated by analysis of numbers of Cameroonian scholarship students studying in France between 1957 and 1960. Of 201 students enrolled in French universities in 1957, there were 29% in medicine, 21% in law, 12% in letters, and 12% in science; by 1960, the percentages had changed to 19% in medicine, 16% in law, 14% in letters, and 22% in science, of a total of 318 students. The greatest changes were in medicine and science; between the years 1957 and 1960 the numbers of students studying medicine were, successively, 59 (29%), 64 (33%), 62 (21%), and 59 (19%), while the comparable figures for science were 24 (12%), 45 (16%), 59 (20%), and 70 (22%). Indeed, during the 1957 and 1958 academic years, Cameroon had the largest numbers of students studying in France of all African countries; in numbers of students studying scientific subjects, Cameroon also leads all African countries.77

Vocational and Technical Education

Before 1948, there existed only one establishment for technical education, the école professionnelle at Douala, which was transformed into a collège technique and then into a lycée in 1960. The Lycée Technique offers a seven-year course leading either to the baccalauréat technique, the brevet de technicien, or the brevet d'enseignement industriel (upper secondary technical or industrial diplomas). The best students are sent to foreign countries for further study; the majority are sent on scholarship to France to prepare for entrance to engineering schools. In 1962, the Lycée Technique held 11 courses with 321

77Percentages determined from information given in Kitchen, op. cit., pp. 524-525.
students.\textsuperscript{78}

Between 1952 and 1956, apprenticeship centers for training in various crafts, such as carpentry, building construction, auto mechanics, electrical work, etc., were created in Nkongsamba, Bafoussam, Douala, Garoua, Edéa, Ebolowa, and Yaoundé. In 1960, these centers became secondary technical schools (\textit{collèges d'enseignement technique}). These schools offer a four-year course after primary school and lead to an industrial certificate (\textit{certificat d'aptitude industrielle}). At the same educational level are the commercial schools (\textit{collèges techniques commerciaux}); these were originally two separate \textit{cours complémentaires} for boys and girls at Yaoundé which were first transformed into \textit{cours complémentaires techniques et commerciaux} and finally into their present status in 1960. These two schools offer a five-year course after primary school which prepares students for the \textit{brevet d'enseignement commercial}. The best students receive scholarships for study in the field of accountancy.\textsuperscript{79}

\textit{Sections manuelles et artisanales} offer a two-year post-primary course in manual arts and skilled crafts for boys; in 1962, there were courses in 27 localities, enrolling 823 boys. For girls, there are the \textit{sections ménagères}, which offer a two-year post-primary course in homemaking; in 1962, there were courses in 12 localities enrolling 305 girls. In both types of courses, the emphasis is on practical adaptation to life.\textsuperscript{80}

\textsuperscript{78}Bala and Lagrave, \textit{op. cit.}, p. 211; letter from Mboumoua; and Sasnett and Sepmeyer, \textit{op. cit.}, p. 635.

\textsuperscript{79}Ibid.

\textsuperscript{80}Bala and Lagrave, \textit{loc. cit.}; also \textit{Statistiques, etc.}, \textit{op. cit.}, pp. 50-51.
Somewhat more than one-half of the technical and vocational schools are run by voluntary agencies, and over half of the students attending technical schools attend these private schools.  

The preceding discussion refers to technical and vocational education in East Cameroun, where a total of 5,740 students were enrolled in 1962 in such courses. By way of contrast, there were only 106 students enrolled in West Cameroon; all were enrolled in a single school—the Trade Centre at Ombe, which offers artisan-level courses in skilled trades. The West Cameroon government plans to develop the Trade Centre to full status as a technical institute offering diploma courses in various technical subjects. The government also plans to introduce lower grade technical vocational schools, with assistance from a UNESCO planning group.

Teacher Education

There are four main categories of teachers in East Cameroun. (1) *Maîtres certifiés* are the lowest level of primary teachers; their sole qualification is the primary school leaving certificate (C.E.P.E.). This category of teacher is being phased out; it is no longer possible to secure a position with only the C.E.P.E. (2) *Maîtres diplômés* are *maîtres certifiés* with five years of experience who are successful on the examination for *diplôme de moniteur de l'enseignement général*. They are raised to a higher salary grade and are known as *moniteurs*. (3) *Maîtres*...
brevetés have completed the lower secondary cycle in a lycée, collège, cours complémentaire, or collège de l'enseignement général, and have received either the B.E. or B.E.P.C. If they have not had pedagogy in their curriculum, they may take a one-year course in professional training at a normal school to become instituteurs-adjoints; these teach all grades of the primary school. (4) Maîtres bacheliers are holders of the baccalauréat who have an additional year of professional training at a normal school, which allows them to become instituteurs, the highest grade of primary school teachers. Many of them take charge of primary schools as directeurs des écoles; as of 1962, there were probably less than forty instituteurs in all of Cameroon.\(^85\)

As moniteurs have had only primary education, their science experiences have been limited to nature study, rural science, and health education. Instituteurs-adjoints have had lower secondary education with a fair amount of time devoted to general science and to the individual sciences. It would appear that, unless specific measures are taken to give primary school teachers broader experiences in the sciences, the future of science education at the primary level will be quite limited.

In West Cameroon, there were 5 elementary training colleges with 479 students training for Grade III certificates, 4 preliminary training colleges with 167 students training for Grade II certificates, and 3 highest elementary training colleges with 148 students training for Grade I certificates.\(^86\) The system of primary teacher education is

\(^{85}\) Survey of the Status, etc., op. cit., p. 14. Also Sasnett and Sepmeyer, op. cit., p. 635.

\(^{86}\) Statistiques, etc., op. cit., p. 10.
similar to that of Nigeria, but unlike Nigeria, which is phasing out Grade III certificates, West Cameroon is planning to expand the production of Grade III teachers. However, it is planned eventually to combine the three-year Grade III course with the two-year Grade II course in a single five-year course, with the first three years devoted to general secondary education and the latter two years to professional training. There have been no facilities for the one-year course to upgrade Grade II teachers to Grade I; this has taken place abroad—usually in Nigeria. There are plans to provide Grade I courses at a combined Grade II-Grade I college, after the Grade II and Grade II courses have been combined. 87

It is also planned, in West Cameroon, to create a new type of Secondary Teachers Training College, designed to produce teachers for the junior classes of the secondary school, with two years of professional training after School Certificate. 88 As mentioned earlier, there is already such a program in East Cameroun; the Higher Normal School of the Federal University prepares teachers for the lower cycle of secondary school and also prepares teachers for normal schools and primary school inspectors. For the upper secondary classes in both East and West Cameroon, university graduates are required.

Of 133 teachers in government and voluntary agency schools in West Cameroon, 22 (or 16.5%) were neither graduate nor certified. 89 In the government secondary schools in East Cameroun, 47 (or 22.2%) of the 212 teachers were not fully qualified. Of these 212, only 57 (or 26.9%)
were Cameroonians; all other teachers were technical assistance personnel from other countries.90

There is an extreme shortage of teachers in the Cameroons. Most young people who attain the necessary qualifications go on to employment in government or industry, where the salaries are much greater.91 Indeed, salaries paid at all levels of certification are even much lower in East Cameroun than they are in other French-speaking countries of Africa; the salaries for comparable ranks may be from 46% to 70% of those in the other countries.92 Therefore, it is no surprise that students are not attracted to the teaching profession; indeed, the flight from teaching of those already in the profession is one of the main reasons for the teacher shortage.93

Secondary school teachers, particularly at the upper level where practically all are university graduates, have been criticized for their inability to impart subject matter, especially science, to their students. Most of these teachers in East Cameroun are graduates of French universities; they know their subject matter well, but have had few, if any, courses in pedagogical theories and methods. Although some have a desire to teach, unless they have a natural ability, they are hampered in their efforts by a lack of orientation toward teaching theory and techniques.

Teaching of science takes place in the lecture room, with

90 Ibid., pp. 36ff.
92 Survey of the Status, etc., op. cit., p. 15.
93 Ibid., p. 16.
memorization from notes and textbooks, and with occasional teacher demonstration, but rarely with student experimentation. Few teachers give quizzes, and such tests as are given are intermittent and irregular. It is up to the student to study in preparation for the examinations; the initiative is his, since he is seldom directly aided by the teacher. Similarly, there does not seem to be any way to judge the competence of science teachers in laboratory situations, since there are few laboratories. The teachers presumably have had laboratory experience in their university studies, but quickly fall into the traditional pattern of teaching for rote memorization when they find that they have no facilities for laboratory work. It seems obvious that before science teachers will be able to perform their tasks in a manner designed to satisfy the criteria for science teaching (as detailed in the introduction to this paper) they will need adequate facilities for demonstration and experimentation and they will have to acquire the necessary training and experience in the use of these facilities.

Problems and Needs in Cameroonian Education

Although 54% of the school-age population was actually in attendance, 96.8% of the total enrollment in East Cameroun in 1962 was in the primary schools. It seems obvious that the educational pyramid is seriously imbalanced, and that more secondary schools must be constructed

---

94 Interviews with Njomou and Placca.
95 Interview with Njomou.
96 Equal Opportunity Through Education, loc. cit.
97 LeVine, op. cit., p. 305.
in order to correct this imbalance. In West Cameroon, the same situation holds; less than one student out of thirty was in either secondary school, teacher training school, or vocational school.\textsuperscript{98}

Within the secondary schools, the educational pyramid is also imbalanced. In government lycées and C.E.G.'s in East Cameroun, there is no serious imbalance within each cycle, but between cycles there is a serious drop. In 1962, of 5975 students in government schools, 85.4\% were in the premier cycle and 14.6\% in the deuxième cycle; at the individual grade levels, the percentages were: VI—25.8\%, V—23.6\%, IV—18.3\%, III—17.7\%, II—6.2\%, I—5.4\%, and terminale—3.0\%. In all schools, public and private, the imbalance was worse, which indicates that the problem is especially severe in voluntary agency schools. Of 18,387 students in all secondary schools, 91.5\% were in the premier cycle and 8.5\% in the deuxième cycle; the breakdown by grade was: VI—33.2\%, V—24.1\%, IV—17.8\%, III—16.4\%, II—4.0\%, I—3.2\%, and terminale—1.3\%.\textsuperscript{99} It would appear that there is a serious drop-out problem at the end of each year of the secondary school, and especially after the cours complémentaire. It may be that acquisition of the B.E. or B.E.P.C. leads many students to seek employment rather than to continue with their education.

Another related problem is that of extending education to the northern reaches of East Cameroun, which is seriously retarded in

\textsuperscript{98}Ibid., p. 306.
\textsuperscript{99}Percentages derived from figures given in Statistiques, etc., op. cit., pp. 13 and 34.
comparison with the south. As Seck says, there is a "tendency to give satisfaction to the towns before the country in matters of schools."

North Cameroon is remote, rural, and Moslem, and all three factors weigh heavily against the expansion of educational facilities in the area.

The Director of Primary Education in East Cameroun cites other problems: (1) education of girls and women, (2) adaptation of the curriculum to Cameroonian culture and needs, and (3) the formation of cadres of middle level technicians and of rural leaders. With regard to the latter, the lack of vocational schools makes it difficult to achieve a balanced output from secondary, technical and vocational schools, all of which are short of buildings and of specialized teaching personnel.

At all levels, there is a need for adequately trained and certified teaching personnel. There is a need for science teachers at the primary school level who have had a background in general science and in teaching science adequate to meet the needs of an acceptable school science program. At the secondary level, the need is for teachers with strong science backgrounds and with professional preparation in teaching science, particularly with respect to the use of laboratories and to the guidance of student experimentation in the sciences. There is a need to move away from rote memorization in teaching and toward more freedom for the student to develop his own understandings with respect to science.

There is a need to develop further the possibilities for higher

---

100 Bala and Lagrave, op. cit., p. 213.
101 Seck, op. cit., p. 55.
102 Bala and Lagrave, loc. cit.
103 Equal Opportunity Through Education, loc. cit.
education in both states. There is a need to Africanize the curriculum here and in lower levels of education in order to adapt it more closely to the needs of the Cameroonian people. The special purpose of higher education is to develop leaders whose outlook will be Cameroonian rather than European. A special province of the university is the provision of facilities for research in all fields of study; at present, the Institute of Cameroonian Research at Yaoundé is available for advanced study and research in the physical and social sciences.\textsuperscript{104}

There is a need for writing of new textbooks and revision of old ones to conform more nearly with present technical and scientific needs and with the specific cultural viewpoints of the Cameroons. To this end, there has been recently established at Yaoundé a center for production of educational manuals, textbooks, syllabuses, literacy manuals, magazines, and other educational materials. (With the assistance of UNESCO, the center started production in August 1962, to serve not only Cameroon, but also other French-speaking countries in Central Africa.)\textsuperscript{105}

**Summary**

The Federal Republic of Cameroon is a large country and diverse in many elements: geography, ethnic background, languages and colonial history. Nevertheless the country expresses a unity of purpose not found in other countries which have similar problems. Whereas diversity in tribal background and language have led to political disruption in

\textsuperscript{104}LeVine, loc. cit.

\textsuperscript{105}"Le Centre de Production de Manuels et d'Auxiliaires de l'Enseignement Installé à Yaoundé," Abbia (Cameroon Cultural Review), I (February, 1963), pp. 91-95.
Nigeria, (and racial and ethnic differences to political upheavals in southern Sudan), the two states of the Cameroons have made a sincere attempt to overcome linguistic differences based on divergent colonial backgrounds. This is not to say that there are no political differences; indeed, each of the states travels its own political path—East Cameroun with its one-party French-type political system and West Cameroon with its multipartisan British-type system; the Federal political system has yet to achieve maturity. Yet, despite present inequities between the states, they intend to maintain and strengthen the Federation.

With the assistance it receives from France, Britain, Nigeria, the United States, and other countries, as well as from UNESCO, Cameroon should in time correct its base-heavy educational pyramid, strengthen its educational offerings at the secondary, vocational, technical, and university levels. Despite the broad base offered by the primary schools, these do not perhaps deliver as much strength to the educational structure as their numbers might suggest. The primary schools are weakest in that they have neither the teachers, facilities, nor curriculum to provide a strong student intake to the secondary schools. The science curriculum is virtually non-existent.

While emphasis is being put upon strengthening—or at least, broadening—the secondary school structure, the fact is that such secondary education as is offered is much stronger in curriculum, teaching, and facilities than is primary education. After expansion of facilities for secondary education, the greatest need is for pointing the curriculum—and concomitantly, the teaching—toward the contemporary needs of

---

modern Cameroon. This means, among other things, Africanizing the curriculum, teaching for thought rather than for content (or more exactly, for examinations), and emphasizing today's needs rather than yesterday's culture. This is true for all subjects of the curriculum, but especially for literature, history and geography, and the sciences. With regard to science education, the need is for facilities and teaching for student investigation. The greatest strength in science is at the upper secondary level, which is virtually non-existent in West Cameroon and all too meager in East Cameroon. At the lower secondary level, where there should be a great emphasis on teaching for scientific literacy, the teaching of general science is in the hands of instituteurs-adjoints whose background in the sciences may be less than adequate.

The Faculty of Science at the Federal University opened in 1962 with eight members of staff, one of whom was professor at the Faculty of Sciences of Toulouse; the others were permanent staff. Almost one-third of the staff of the other two faculties were expatriate visiting professors.107

Although little data is available regarding achievements by the university, it would be expected that it must by now be having an impact on the cultural aspect of the country, however small for the moment. Just as the University of East Africa, with its branches in Kenya, Uganda, and Tanzania, has had an effect on all of English-speaking East Africa, and just as the University of Dakar in Senegal has influenced all of French-speaking West Africa, so it may be that the Federal University of Cameroon will have a far-reaching impact, not only on the people of

Cameroon, but on all French-speaking peoples of Central Africa.

It appears then, that, within the limits of available financing, and assuming that political and cultural differences will not hinder national plans for educational development, Cameroon well may be on the road to the social, technical, and educational development which is needed for emergence into full-fledged partnership in the modern world community of nations.
CHAPTER V

EDUCATION IN SUDAN

The Republic of the Sudan (officially, Jamhuryat El-Sudan)\(^1\) is a country about one-third the size of the United States, with an area of 967,501 square miles.\(^2\) The largest country of Africa, it is bordered by the United Arab Republic (Egypt) on the north, by Libya, Chad and the Central African Republic on the west, on the south by Leopoldville Congo, Uganda and Kenya, and on the east by Ethiopia and the Red Sea.\(^3\) The northern fourth of the country is desert,\(^4\) which may account for the low population density of 13.8 people per square mile. The population, which grew from 10,252,000 in 1956\(^5\) to 13,372,000 in 1965\(^6\), is 90\% rural; if the rural population, perhaps 20\% consists of nomads.\(^7\) The highest

\(^2\) Africa, op. cit., p. 93.
\(^6\) Reader's Digest Almanac 1966, op. cit., p. 880.
\(^7\) Area Handbook, etc., op. cit., p. 46.

194
concentration of people is in the triple city area of Khartoum-Khartoum North-Omdurman; the total population in this area undoubtedly exceeds three hundred thousand persons.  

The Sudan is an amalgam of many ethnic groups which share some sense of unity because of three characteristics: (1) Arabic blood claimed by four out of ten Sudanese, (2) the Arabic language as the vernacular of half of the population, and (3) the Islamic religion and way of life followed by seven in ten. Actually, the people sharing these characteristics are to be found in the northern six provinces, along with other major ethnic groups, such as the Nubians and the Beja; the tribes of the three southern provinces are Nilotic negroes, the most important of which are the Shilluk, Denka, and Nuer. The Nilotes speak a great variety of Central African dialects and are animistic pagans, except for a minority of Christians. Although Arabic is not spoken by the southern populace, it does serve as a lingua franca among traders and for communication between tribesmen of different language groups.

Early and Recent History

Sudan's history stems from the dawn of civilization in the Nile Valley, with the first known settlements dating as early as 5000 B.C. Although Christianity entered the Sudan in the sixth century, much of

---

8 Reader's Digest Almanac 1966, loc. cit.
9 Legum, op. cit., p. 91.
11 Akrawi, loc. cit.
the country was converted to Islam when the Turkish Mameluke rulers of Egypt overthrew the existing regime eight hundred years later. After a century and a half of strife, an independent Moslem kingdom was set up which extended over most of present-day Sudan. 12

In 1820, Mehemet Ali, an Ottoman of Albanian birth who had been Pasha of Egypt since 1805, conquered the territory to the south of Egypt and made it subject to the government in Cairo. 13 His nephew, Ismail Pasha, extended Egyptian domination to the headwaters of the Nile, using European explorers and adventurers. In an effort to suppress the flourishing slave trade, Ismail Pasha appointed General Charles George Gordon governor-general of the Sudan in 1877. 14 Subjugation to the Turkish government in Cairo continued until 1885, when Mohammed Ahmed, a sheikh of the Sammaniyyah order, who had a few years earlier proclaimed himself Mahdi—the Messiah of Islam—completed his three-year fight to gain control of the country by overthrowing rival forces in Khartoum. Although the Mahdi died of typhus six months later, the Mahdist regime continued under one of his followers, the Khalifa Abdullahi, until it was overthrown by English and Egyptian forces in 1898. 15 The British, who had entered Egypt in 1882, partly to protect the Suez Canal, joined with the Egyptians to overthrow the Mahdist regime in 1898. In 1899, Egypt and Britain joined in a strange political relationship, a condominium which

---


13 Area Handbook, etc., op. cit., p. 18.


took over the rule of the Sudan, and which lasted until 1953.\textsuperscript{16}

During the Anglo-Egyptian Condominium, the country entered a period during which British and European concepts of nationhood, government, law, education, and medicine were introduced.\textsuperscript{17} The surge toward independence began to gather momentum after World War II. Early in 1953, Egypt and Great Britain agreed to allow the Condominium government to give way to Sudanese self-government over a three-year transitional period. On January 1, 1956, the Sudan became an independent republic. Failure to resolve various conflicts led to assumption of power by the army in November 1958, with General Ibrahim Abboud, aided by a Supreme Military Council, holding full dictatorial powers.\textsuperscript{18}

Not the least of the difficulties besetting the government was the problem of relations with the three southern provinces. Stemming from the Mahdiya period, when wars, slavery and disease reduced the population to less than one-fourth of what it had been before the Mahdist uprising, the strained relations were due to opposing views as to the worth of the Mahdi, the Islamic religion, and the Arabic language. During the Mahdiya, slavery saw a resurgence from the low level to which it had fallen during Turkish rule, and ever since, the negroes of the south have resented the second-class citizenship to which their slave heritage

\begin{flushright}

17 For excellent discussions of British influence during the Condominium period, see \textit{The Sudan, 1899-1953}, op. cit., pp. 10-22, Bonfanti, \textit{op. cit.}, pp. 28-31, and \textit{Area Handbook, etc., op. cit.}, pp. 24-31.

18 \textit{Area Handbook, etc., op. cit.}, pp. 31-32.
\end{flushright}
has reduced them. Also, in recent years, they have strongly rejected the attempts of the controlling north to impose the religion of Islam and the Arabic language, usually by means of the educational system. The northern Sudanese, of course, see things differently. From their point of view, the Mahdi freed the country from Turkish rule and unified it. Also, the Arabic language is viewed as a means toward unifying the country culturally and politically. Finally, Islam is a proselytizing religion; as the true Faith, it must be spread. The sporadic wars which have taken place since 1955 between the north and south have enjoyed occasional cease-fires when the rebel south and the northern government have agreed to talk peace terms; however, as of this writing, the problem persists. Because of the failure of his government to provide a satisfactory solution to the north-south problem, among others, General Abboud was deposed on October 21, 1964 by a revolt led by students at the University of Khartoum, and a democratic government, led by Prime Minister Sir El Khatim El Khalifa, was installed. One of the obvious steps taken to unify the country was the appointment of Clément Mboro, a southern Catholic, as Minister of the Interior. However, the differences between north and south persist, and the achievement of unity seems remote.

19 Bonfanti, op. cit., p. 27.
21 Bonfanti, op. cit., p. 40.
Early Development of Education

Islam penetrated Africa very slowly, starting with the occupation of Christian Egypt by the Arabs in 640. It progressed to the west and to the south, bringing Islamic culture with it. However, once the Arabs reached the Nilotic tribes in southern Sudan, they found that their proselytizing efforts were ineffective. Arabic thought, which came into prominence starting in the eighth century, particularly in science, spread through North Africa, replacing stagnant Roman culture. However, between the fourteenth and twentieth centuries, Islamic civilization lay dormant, contributing little to education and science.

Under the impact of increased European influence, Mehemet Ali, the first viceroy of Egypt, set up primary schools in order to supply needed trained personnel for his expanding bureaucracy. There were separate schools for the masses and for the elite; the latter went on to secondary and university education, chiefly in France. In 1869, the kuttabs, the traditional Islamic schools (or khalwas), were inspected and organized into standard four-year elementary schools. Although these educational efforts filtered down to the Sudan, particularly to Wadi Halfa and other northern regions, most education was at the khalwa level. During the Mahdiya, education was religious in nature, with learning in the khalwas limited to rote memorization of the Koran; little importance


was attached to reading and writing. Higher education took place at the mosque; available only to a small minority, it concerned itself with Koranic theology, law, and classical Arabic.25

During the Condominium, general education was ignored. A few schools, patterned after those of Britain, prepared students for external English examinations, and trained them for service in the government. Just before the colonial period, there were only two primary schools in Sudan; at the end of the second year of the Condominium, there were seven. In one of his first acts after defeating the Mahdists, General Kitchener appealed to Britain for funds to open Gordon Memorial College; for the first few years after its establishment in 1902, the College was no more than a large primary school. It became the first secondary school in Sudan in 1913 and eventually became part of the University of Khartoum.

For the first three decades of the Condominium, the development of education was hampered by a shortage of funds and trained Sudanese teachers. Besides, the Sudanese sought European education only as a means toward entering government service. By 1921, there were some 9000 students undergoing elementary education; by 1931, there were 11,500 students in 89 elementary schools, 11 intermediate and higher primary schools, 3 technical schools, 2 secondary schools and 1 teacher training school; of these pupils, 534 were in secondary school.

Educational progress in the south was much slower than in the north. There was a multiplicity of languages, with none common to everyone, and none of the languages were written. Responsibility for providing

25Area Handbook, etc., op. cit., p. 157; also Sasnett and Sepmeyer, op. cit., p. 239.
education fell on the Christian missionaries, who built and maintained a large number of village elementary and technical schools. Gradually, these schools came under the supervision of the Sudanese government, which was only too glad to have them available, since the governmental resources had been expended on schools in the north. After coming under government supervision, the mission schools began receiving grants-in-aid to improve their services. 26

Development of Educational Structure

Under the Condominium, the Koranic schools were allowed to continue, but their quality was improved by inspection, subsidies and in-service education for the most promising teachers. After 1934, many of these were replaced or absorbed into new locally-controlled village schools, of which there were over 250 by 1948.

A lack of teaching staff hindered the growth of education at other levels; to remedy this situation, the Institute of Education was founded at Bakht er Ruda, about seventy miles south of Khartoum. The institute, during the colonial period, trained new teachers for elementary and village schools, provided the final training for secondary school teachers, provided refresher courses for teachers who were appointed before the advent of the institute, and served as an educational research station, revising textbooks and curricula. Under the Condominium, secondary education was available in three government schools by 1949, and technical training was available at the Khartoum Technical Educational Data: The Sudan, op. cit., p. 2; Sasnett and Sepmeyer, loc. cit.; The Sudan, 1899-1952, op. cit., pp. 40-42; and Area Handbook, etc., op. cit., pp. 157-158.
Institute, at four technical schools in northern Sudan, two trade schools in the south, and at various other institutions. Meanwhile, the Gordon Memorial College was gradually raised to university status, first by becoming semi-autonomous and adding schools of agriculture and science in 1945, and then by becoming independent and being reconstituted as the University College of Khartoum in 1951. Despite this educational progress, the comparatively recent development under the Condominium left from 85% to 90% of males over the age of fifteen illiterate as of 1953.27

Since independence, the Republic of the Sudan has become aware of its need for a literate, informed citizenry, for technicians, and for trained personnel in all areas of national life. Education is seen as the means for overcoming widespread illiteracy, alleviating the shortage of skills, and unifying the nation by absorbing the isolated peoples of the south into the Arabic-speaking north.28

There has been no significant break with British methodology since independence; educational aims and techniques are closely patterned after those introduced by the British before independence. The growth in numbers being educated, however, is quite remarkable. From 137,500 attending all schools below university level in 1950 under colonialism,29 the student population grew to 270,000 in 1960,30 and 490,000 in 1963.31

27 The Sudan, 1899-1953, loc. cit.
28 Educational Data: The Sudan, loc. cit.
29 The Sudan, 1899-1953, op. cit., p. 43.
30 Kitchen, op. cit., p. 70.

In 1958, Ziada Arbab, the Minister of Education, appointed a committee of eleven Sudanese educators, presided over by the UNESCO expert Matta Akrawi, to investigate the aims and means of education in the Sudan and to propose a new plan for education consistent with the aims of the revolutionary government. The Minister asked UNESCO to appoint an expert on educational planning, Abdel Hameed Kadhim to suggest steps for implementation of the proposals of the Akrawi Committee. In November 1960, Dr. Kadhim submitted his report, from which the Minister developed his plan for education. 32

The educational aims set down by the Minister of Education in the New Plan were four-fold:

The first of these aims is the handing down of our national heritage and culture to new generations, bearing in mind that this culture is capable of change and development, and that heritage is neither static nor stagnant.

The second of these aims is, bearing in mind that the reform of society depends on the reform of the individual, to train the citizen in the service of his Country and his fellow human beings. The training of the individual must not neglect either his physical, mental or spiritual aspects.

The third of these aims is to cultivate the tone and spirit of religion in our young generation, and the generations of the future.

Last—but not least—one of the most important aims of the new educational plan in the Sudan is to make it more practical by introducing practical subjects suited to the environment. 33

The problems considered by the Minister were (1) the educational ladder, (2) the training of teachers, (3) the curricula of the schools,

---

33 Ibid., pp. 4-5.
and (4) examinations.  

The new educational ladder was to consist of six years of primary education, starting at age six, four years of general secondary school (replacing the intermediate school), and four years of senior secondary school, for a total of fourteen years of general education preceding the university. New primary schools were to consist of two-year schools feeding a central primary school with the upper four years, and regular six-year schools. General secondary schools were to be of three types: vocational academic, technical secondary, and girls secondary. The senior secondary was to have separate academic secondaries for boys and girls, separate vocational secondaries, and technical secondaries. The senior secondary schools were to feed the institutions of higher education.

The curriculum of the primary school was to include agriculture, animal raising, and local crafts, with special emphasis on religion and Arabic, in addition to the usual subjects of the primary school. The curriculum of the general secondaries was to center on vocational studies, with 20% to 50% of the time devoted to academic studies. The aim of the secondary school was to provide specialization in the various subjects, with broad academic studies as an adjunct.

Primary teachers were planned to have a level of education equivalent to that of senior secondary school graduates; thus, the Primary Teachers Training College would be equivalent to the four years of the senior secondary school. The curriculum for primary teachers would include

---

\(^{34}\)Ibid., p. 6.  \(^{35}\)Ibid., pp. 6-10.  \(^{36}\)Ibid., pp. 11-12.
academic and educational studies, with additional study of practical subjects and crafts which were expected to be part of the primary school curriculum. General and senior secondary school teachers were expected to have four years of training after the senior secondary level at the Higher Teachers Training College, with emphasis on academic subjects and pedagogy and teaching methods. To provide this level of instruction, a Higher Teachers Training College was to be initiated at Bakht er Ruda in 1961.37

Bakht er Ruda was to maintain its responsibility for curriculum making for the primary schools, including those of the south. Although the first two years of primary school in the south were to be in the vernacular, writing was to be done in the Arabic alphabet, rather than in Roman letters. For all secondary schools, English was to be taught as a foreign language in the early years, and to be used as the medium of instruction in later years.38

Under the New Plan, it was expected that the percentages of children able to find places in the schools would rise considerably at all levels, except for the general secondary school. It was also expected that university attendance would double to 3000 in the decade ending in 1970.39

In 1966, the New Plan was criticized by the Government Secondary Schools Teachers Union on the following bases: (1) The plan did not take into consideration increasing the numbers of children in school. (2) It aimed only at increasing the number of schools, without considering staffing or equipment. (3) The Ministry neglected its plan for the educational

39The Republic of the Sudan, op. cit., p. 87.
ladder and continued the old 4-4-4 pattern. The Union stated its belief that with present implementation, the percentage of illiteracy would actually be higher in 1970 than at the inception of the plan. 40

The Educational Structure

Education in the Sudan is the responsibility of the Minister of Education, assisted by a Director of Education. Advising the Director is a Board of Section Heads, which includes the following: (1) Assistant Director of Education in the Southern Provinces, concerned with girls' schools and intermediate and secondary schools in the south, (2) Cultural Attaches, one in the Embassy in Cairo and one in the London Embassy concerned with Sudanese students abroad, and (3) Technical Assistant Director of Education and Principal of the Institute of Education at Bakhter Ruda, supervising elementary education and responsible for related research and teacher training. In each of the nine provinces, a Province Education Officer supervises administration of elementary schools and non-administrative functions of intermediate schools. 41

General education is provided in three levels of four years each. These are elementary (awwaliya), intermediate (wusta), and secondary (thanawiya). There are also sub-standard junior elementary or sub-grade schools (madrasah sughra) which offer a three-year course and village schools which offer a two-year elementary course. Entrance to each of

---


41 For a fairly complete discussion of the functions of the Ministry of Education, see Heath, op. cit., pp. 535-540. For a complete description of the functions of Province Education Officers, see Province Education Officer's Handbook (Khartoum: Ministry of Education, n.d.).
the levels after elementary is by competitive national examinations.

Technical and vocational education is offered at the Khartoum Technical Institute (KTI), at commercial secondary schools, at Khartoum Senior Trade School, at the Vocational Training Center in Khartoum, and at two agricultural training centers. Teacher training takes place at the Institute of Education at Bakhter Ruda and at various small teacher training centers, where teachers are trained for elementary and intermediate education. Secondary school teachers are university graduates.

Higher education is provided at the University of Khartoum, at KTI and at the Cairo University Branch in Khartoum. 42

Elementary Education

The education of the Sudanese child may start at the age of five or six if his parents can afford to send him to a private kindergarten for a year or two; otherwise, he starts his education in the elementary school at the age of seven. 43 Many children, both boys and girls, attend the khalwa, or Koranic school, before going to elementary school. 44

In the villages of the north, there are three-year (and lately, also four-year) schools—called junior elementary schools—where both the teaching staff and the instruction are usually below the standards of the regular four-year urban elementary schools. Upon completion of the course, children sit for an entrance examination to the fourth year of

42 Educational Data: The Sudan, op. cit., pp. 3-9.
44 Interview with Ali.
the regular elementary school. Sometimes, the minimal program of the sub-grade school forces them to enter the third year of the regular elementary school, rather than the fourth.45

Sub-grade schools serve as junior elementary schools in the north; in the south, the junior elementary schools are two-year village schools. There is usually one teacher for the entire school, much as in the rural schools of the United States.46 Instruction in reading, writing, and arithmetic is given in the vernacular. At the end of the second year, upon passing an entrance examination, a student may be admitted to the third year of a regular elementary school. Instruction in the third and fourth years of elementary school in the south is in English, but it is planned that, as more trained teachers become available, the language of instruction will be Arabic. In the north, all instruction in the elementary school is in Arabic, except in some junior elementary schools, where teaching is in the vernacular.47

The village, bush, and sub-grade schools are run by local councils with financial support from the central government. In addition, the government sets standards and provides training for the teachers.48 The intention of the Ministry of Education is to arrange for the preparation of fully qualified elementary teachers in sufficient numbers so that all elementary schools in the country will be fully accredited four-year

45Educational Data: The Sudan, op. cit., p. 3; also Akrawi, op. cit., p. 258.
46Interview with Ali.
schools, providing the same kind of education for all children.  

The curriculum in the upper two years of the elementary school includes, in addition to reading, writing, and arithmetic, the study of history, geography, and civics, as well as hygiene and handiwork. In addition, the study of religion is required in all elementary schools.  

At the end of elementary schooling, students sit for the Elementary Final Examination, which is set at Bakht er Ruda and is administered and marked by a local board of intermediate schoolmasters. Passing, which is relatively easy, permits the student to leave elementary school, but does not guarantee entry to the intermediate school. Since places in the intermediate school are limited, the Final Examination becomes competitive, and only the highest scorers may enter the intermediate school.  

Some idea of the growth of elementary education in the Sudan may be gathered from a comparison of the numbers of schools in the years 1955 and 1960: 540 to 1,104 boys' sub-grade schools; 390 to 659 boys' elementary schools; 24 to 233 girls' sub-grade schools; 147 to 291 girls' elementary schools. In a six-year period since the revolution, numbers in the elementary schools increased as follows: 258,957 (1958-1959), 278,840 (1959-1960), 317,761 (1960-1961), 335,089 (1961-1962), 372,400 (1962-

---

50 Educational Data: The Sudan, loc. cit.  
51 Province Education Officer's Handbook, op. cit., p. 22.  
1963), 397,799 (1963-1964). The last figure represents 81% of the total school enrollment in the Sudan, from pre-primary level to the university.

Science Education

The experiences of the Sudanese interviewed by this writer indicate that there was very little or no science taught in the elementary schools in the 1930's and 1940's. However, an elementary school syllabus for 1951 indicates that the teaching of science was allotted a place in the curriculum. Although no science was given in the first year, 2 of 29 periods in the second year, 3 of 31 periods in the third year, and 2 of 31 periods in the fourth year were to be devoted to science. The dropping of one period in the last year may have been due to the addition of one hour of gardening to the fourth year curriculum.

The stated aim of elementary science teaching for boys was student observation and derivation of natural laws. In second "grade," the

---


57. Personal interview with Hamid Abdel Magid Gasim of Sudan, at the Ohio State University, August 21, 1964. Also, interviews with Ali and Hassan.

boys were provided with pictures to go with the textbook used by the teacher, which represented an elementary course on living things such as mammals, birds, reptiles, insects, and plants. The next year was devoted to a study of earth, water, air and fire, and their relationship to man. One period of the three was devoted to maintenance of individual "nature diaries." The final year was devoted to topics aimed at giving the boys information about themselves, particularly with regard to the body, cleanliness, disease, first aid, harmful insects, and other assorted topics.\(^{59}\)

The 1951 syllabus for elementary schools is identical with that given in a 1958 UNESCO publication, and quoted in a United States government publication in 1963;\(^{60}\) it would appear that the curriculum for elementary schools in Sudan has not changed, and that the teaching of science is no different today than it was in 1951, excepting for the improvement in quality of teachers and teaching materials.

**Intermediate Education**

Entrance to intermediate schools is by sitting competitively for the Intermediate Schools Entrance Examination. The examination scores determine whether a student will go on to intermediate education, and if he does, whether he will be placed in an academic school or in a technical school.\(^{61}\) The examination is set by a board whose executive and


secretary is the Province Education Officer. As noted earlier, the number of students admitted to the intermediate schools is dependent upon the number of available places. Thus, for example, although over half of the boys sitting for the examination in 1963 passed, less than three-fourths of these entered intermediate schools; although slightly over one-third of the girls passed, slightly over one-half of these actually enrolled.

Intermediate education in the Sudan has a two-fold objective: "firstly to provide the Secondary Schools with qualified candidates for secondary, academic and technical education, and secondly to give the pupils a reasonable standard of knowledge and culture that will help them in life, as the majority of them will not have a chance of secondary education." During the colonial era, intermediate education served mainly as a training ground for government officials. At present, its importance in preparing students for secondary school and in providing technicians is such that, in a six-year period ending in 1960-61, intermediate education increased four-fold. Following are the numbers of boys and girls enrolled in academic intermediate schools over a period of six academic years: 20,705 (1958-1959), 22,221 (1959-1960), 23,298 (1960-1961), 24,163 (1961-1962), 31,400 (1962-1963), 33,451 (1963-

---

62 Province Education Officer’s Handbook, loc. cit.
64 Education Under National Rule, op. cit., p. 31.
These figures represent probably less than 3% of the school-age population.

Arabic is the medium of instruction in northern schools, with 9 of the 34 to 36 periods devoted to its study; English is the second language, with 10 periods per week devoted to it. In southern schools, English is the medium of instruction, with Arabic as the second language; however, Arabic is gradually replacing English in this respect. The rest of the curriculum of the academic intermediate school includes mathematics, religion, handwork, geography, history, and possibly science.

Science Education

The teaching of science in the intermediate school has proceeded in an irregular manner. There was little or no science taught during the colonial period. In recent years, there have been attempts to give more general science at the intermediate level, but these were not successful and were discontinued. In the past two or three years, those responsible for curriculum in the Sudan have made further attempts to re-introduce general science, under the prodding of foreign advisers. At the moment, the status of science education at the intermediate level...

---

69 Educational Progress in Sudan, 1963/64, loc. cit.
70 Sasnett and Sepmeyer, op. cit., p. 240.
71 Educational Data: The Sudan, op. cit., p. 4.
is somewhat uncertain.\footnote{Interviews with Ali, Gasim, and Hassan.}

It is interesting to note that a 1958 UNESCO publication indicates that science was taught for two periods per week in the third and fourth years of the intermediate school;\footnote{Quoted in \textit{Educational Data: The Sudan}, loc. cit.} a 1966 publication, however, reveals no science in the curriculum.\footnote{Sasnett and Sepmeyer, loc. cit.}

**Secondary Education**

Upon completion of intermediate school, students sit for the Intermediate School Final Examination. Successful candidates receive the Intermediate School Leaving Certificate, which permits them to sit for the Secondary Schools Entrance Examination. Passing the examination does not guarantee admittance to a secondary school since, as with other levels of education, there are too few places. In 1961-62, for example, of the 60% of the boys and girls who passed the entrance examination, only 60% were admitted to government and private secondary schools and teacher training centers.\footnote{Educational Statistics, 1961-1962, op. cit., pp. 75-76.}

There are three types of secondary schools: academic, technical, and commercial. (The latter two will be discussed in a later section.) The best candidates on the entrance examination go to the government secondary schools; lesser qualified passers go to private secondary schools and the least qualified go to technical and commercial secondary schools.\footnote{Sasnett and Sepmeyer, \textit{op. cit.}, p. 241.}
The academic secondary curriculum includes Arabic language and literature, English language and literature, art, geography, history, science, mathematics, religion, general education, and physical education with military training. (The technical secondary students study the same subjects, together with technical drawing and engineering. The commercial students study commercial subjects in addition to the academic curriculum.) On the basis of general examinations conducted at the end of the second year, students are assigned to one of four sections in the third year: Arabic, English, mathematics, or science.

At the end of the four-year program, students sit for the Joint examination for the Sudan School Certificate and the University of London G.C.E. (In 1962, the Sudan Examinations Council, which had been conducting the Secondary School Leaving Examination in collaboration with the Cambridge Syndicate since 1951, became independent and its examinations have since been accepted on a par with those of Cambridge. The Sudan Examinations Council also administers other examinations such as civil service, accountancy, etc., in the manner of the West African Examinations Council.) Successful candidates who satisfy certain minimum standards may go on to the University of Khartoum, to KTI, to a teacher training college, to study at a foreign university, or to some other form of higher education.

As with other levels, secondary education has been expanding rapidly in the Sudan. In a five-year period ending in 1961-62, government

77 Ibid.  78 Educational Data: The Sudan, op. cit., p. 5.
79 Sudan Almanac, etc., op. cit., pp. 158-159.
80 Sasnett and Sepmeyer, op. cit., pp. 246-249.
secondary schools grew from 8 to 20.\textsuperscript{81} Between 1958 and 1962, enrollment in academic government schools increased from 5360 to 8561.\textsuperscript{82} Of the total of 18,063 students in all secondary schools in the Sudan in 1961-62, one-third were in government schools of all kinds, and about five-sixths of all students were in academic education. The total number of students in secondary schools constituted only 1.7% of the secondary school age population, and 4.3% of all those attending school.\textsuperscript{83}

Science Education

Science is taught in the academic secondary school in preparation for the Sudan School Certificate. Each of the sciences is taken at a fairly general and simple level in the first year. Study of each of the sciences continues throughout the four-year period. There are two or three lectures per week, and two two-hour laboratory periods. Most of the laboratory time is devoted to teacher demonstration, principally because of the shortage of laboratory equipment.\textsuperscript{84} Of the 924 hours in the secondary school academic year, 88 (or 9.5%) are devoted to science in the first two years and 132 (or 12.2%) are devoted to science in the last two years. Translated into weekly terms, of the 28 hours in the school week, two hours and forty minutes are for science in the first two years and four hours are for science in the last two years. (Only Arabic language

\textsuperscript{81} Education Under National Rule, op. cit., p. 55.


\textsuperscript{84} Interview with Hassan.
and literature, English language and literature, and mathematics receive more time in the secondary school curriculum.\textsuperscript{85}

While there seems to be little difficulty in recruiting teachers for elementary and intermediate schools, there is a great shortage of qualified secondary teachers, particularly in mathematics and science.\textsuperscript{86} To cope with the need, the secondary schools have found it necessary to employ expatriate teachers, to the extent of one-third of the total faculty, despite the desire of the government to eventually Sudanize the teaching body at all levels.\textsuperscript{87}

The teaching of science at the secondary level has been criticized for its emphasis on memorization and the acquisition of knowledge, rather than for the promotion of critical thinking and problem-solving. Science is taught by lecture and teacher demonstration, with little emphasis on self-discovery methods. Shortages of laboratory equipment for student experimentation contribute to these deficiencies in secondary science education. Another source of difficulty stems from the shortage of science textbooks; of those available, most are of British origin, and not suited to the Sudanese environment. Sudanese interviewed by this writer believed that the science curriculum should be so redesigned as to bring it more closely into relationship with real-life situations in the Sudan; further, they believed that the curriculum should

\textsuperscript{85}Sasnett and Sepmeyer, op. cit., p. 241.


\textsuperscript{87}Educational Statistics, 1961-1962, op. cit., p. 44.
be adapted to local needs in different parts of the country.  

Higher Education

The University of Khartoum came into being on July 24, 1956, seven months after the establishment of the Republic of the Sudan. The university developed from the University College of Khartoum by the fusion of the Gordon Memorial College (with Faculties of Agriculture, Arts, Engineering, Law, Science, and Veterinary Science) and the Kitchener School of Medicine. The academic standard of the University College was recognized in 1945 by the University of London, which admitted it to Special Relationship whereby courses for London degrees were instituted in various faculties. There were also courses for local diplomas in a number of the faculties.

Holders of the Sudan School Certificate or equivalent who meet certain minimum standards may be admitted to one of the faculties, of which, at present, there are agriculture, arts, economic and social studies, engineering, law, medicine, science, veterinary sciences, and pharmacy. Baccalaureates, master's degrees, and doctorates are awarded in most of the faculties.

The Faculty of Science offers courses in chemistry, physics, botany, zoology, geography, applied mathematics, pure mathematics, and geology. Degrees are granted at all three levels.  

---

88 Interviews with Ali, Gasim, and Hassan.
89 Sudan Almanac, etc., op. cit., p. 160.
90 Sasnett and Sepmeyer, op. cit., pp. 251-255.
91 Ibid., pp. 267-269.
research in science is carried out at the university, but applied re-
search takes place in various places in the country and comes under the
responsibility of the respective ministries.\(^92\)

Higher education also takes place at Khartoum Technical Institute,
which grants degrees in engineering, at the Khartoum Nursing College,
which gives a three-year course leading to the R.N., the Khartoum Branch
of Cairo University, which offers academic studies mainly to night-school
students, and includes the only college-level school of commerce in the
Sudan, and various institutions of higher Islamic religious learning.\(^93\)

Professional higher education is offered at the Shambat Institute
of Agriculture, which offers a two-year course leading to the Certificate
in Agriculture, the Institute of Public Administration in Khartoum, which
offers courses for senior, middle-management, and clerical personnel of
varying duration, the Forest Rangers' College at Khartoum, which offers
a two-year program, and the School of Hygiene at Khartoum, which offers
the final two years of a three-year program begun at KTI, leading to the
Diploma of Public Health Inspectors.\(^94\) Higher education for teachers
will be discussed in a later section.

**Technical Education**

There are two types of technical education in the Sudan—trade
schools and technical schools. Each of these types has an intermediate
stage and a secondary stage, excepting that the secondary course in the


\(^93\) *Area Handbook, etc., op. cit.*, pp. 167-168.

\(^94\) Sasnett and Sepmeyer, *op. cit.*, pp. 276-279.
trade school is of only three years duration. The main difference between the two types is that, in the technical school, about two-thirds of the syllabus is academic or theoretical and only one-third is practical, while, in the trade school, about two-thirds of the syllabus is practical and only one-third is academic.\footnote{Educational Statistics, 1961-1962, \textit{op. cit.}, p. 6.}

In the four-year technical intermediate school, courses are given in carpentry, metal work, practical drawing, workshop technology, science, and general subjects. Completion of the course leads to the Intermediate School Leaving Certificate.\footnote{Sasnett and Sepmeyer, \textit{op. cit.}, p. 273.} The numbers of schools and pupils in technical intermediate education have increased considerably. Following is a breakdown of this growth over a nine-year period:

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Numbers of Schools</th>
<th>Numbers of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955-1956</td>
<td>4</td>
<td>680</td>
</tr>
<tr>
<td>1956-1957</td>
<td>5</td>
<td>689</td>
</tr>
<tr>
<td>1957-1958</td>
<td>11</td>
<td>1039</td>
</tr>
<tr>
<td>1958-1959</td>
<td>12</td>
<td>1390</td>
</tr>
<tr>
<td>1959-1960</td>
<td>12</td>
<td>1413</td>
</tr>
<tr>
<td>1960-1961</td>
<td>15</td>
<td>1694</td>
</tr>
<tr>
<td>1962-1963</td>
<td>22</td>
<td>2400</td>
</tr>
<tr>
<td>1963-1964</td>
<td>25</td>
<td>3021</td>
</tr>
</tbody>
</table>

The facilities of the intermediate technical schools are put to efficient use by making them available to night classes; in 1960, these night classes were attended by some 2000 persons.\footnote{Educational Statistics, 1961-1962, \textit{op. cit.}, p. 50, and Educational Progress in Sudan, 1963/64, \textit{op. cit.}, p. 4.}

Students who pass the Intermediate School Leaving Examination

\footnote{Kitchen, \textit{op. cit.}, p. 71.}
may enter the three-year post-intermediate trade schools or, if they rank high enough, the four-year Technical Secondary School of KTI.

The Post-Intermediate Trade Schools offer engineering and building trade courses, such as machine engineering, civil engineering, motor vehicle mechanics, electrical installations, carpentry and joinery, furniture making, bricklaying, plumbing, and sanitation. The curriculum includes practical shop work, shop technology, applied science (4 out of 42 periods per week), general drawing, mathematics, Arabic and general education, English, and applied drawing. Upon completion of the course, students sit for the City and Guilds Intermediate Certificate. Those who receive the certificate are considered skilled craftsmen and may secure good positions in industry.

Some of the trade school graduates enter the Senior Trade School at KTI, which offers a two-year program in the fields of electronics, metal trades, carpentry, masonry, and plumbing. On completion of the program, students sit for the City and Guilds Final Certificate. Most of these graduates fill positions as foremen in industry.

The Technical Secondary School, open to graduates of intermediate technical schools, comes under the School of Engineering of KTI and offers five-year programs in mechanical, automobile, and electrical engineering, and in bricklaying, plumbing, and carpentry. Students who complete the course sit for the Ordinary National Certificate Senior Diploma. Secondary school graduates may enter two-year courses in the same fields and for the same diploma, as well as a two-year program for

99 Sasnett and Sepmeyer, loc. cit.
100 Ibid., p. 274.
surveyors, leading to the Intermediate Examinations of the Royal Institute of Chartered Surveyors. Holders of the Ordinary National Certificate Senior Diploma may enter an additional two-year program leading to the Higher National Certificate Advanced Diploma. 101

The growth of technical secondary education is indicated by the following figures, which include statistics for the Technical Secondary School of KTI and the post-intermediate trade schools, which first came into being in 1956.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Numbers of Schools</th>
<th>Numbers of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955-1956</td>
<td>1</td>
<td>69</td>
</tr>
<tr>
<td>1956-1957</td>
<td>5</td>
<td>209</td>
</tr>
<tr>
<td>1957-1958</td>
<td>5</td>
<td>375</td>
</tr>
<tr>
<td>1958-1959</td>
<td>5</td>
<td>547</td>
</tr>
<tr>
<td>1959-1960</td>
<td>5</td>
<td>628</td>
</tr>
<tr>
<td>1960-1961</td>
<td>5</td>
<td>711</td>
</tr>
<tr>
<td>1961-1962</td>
<td>7</td>
<td>802</td>
</tr>
<tr>
<td>1962-1963</td>
<td>10</td>
<td>900</td>
</tr>
<tr>
<td>1963-1964</td>
<td>10</td>
<td>1123</td>
</tr>
</tbody>
</table>

Khartoum Technical Institute, or KTI, as it is more generally known and familiarly called, was opened in 1950 to meet the technical needs of the Sudan. Through revision of syllabuses and the employment of highly qualified teachers, the standards of instruction and study have risen to the extent that KTI has become a college recognized by the Union of Lancashire and Cheshire Institutes. The Institute consists of the three main Schools of Engineering, Commerce, and Fine and Applied Arts, four academic (general education, mathematics, science, English) departments,

101 Ibid., pp. 274-275.
the Department of Further Education, and the Girls' Secretarial School. 103

The School of Fine and Applied Arts accepts intermediate academic school graduates and provides a four-year secondary course leading to the Sudan School Certificate, followed by a four-year course with specialization in painting, pottery, or sculpture, leading to the Art Diploma. The program is designed for the training of art teachers. 104

The School of Commerce accepts graduates of the secondary commercial schools and provides a three-year course leading to the Intermediate Examination of the Association of Chartered and Corporate Accountants. After practical experience and two more years of study at the School of Commerce, students may sit for the Final Examination of the A.C.C.A. 105 (Secondary Commercial Schools prepare students for commercial occupations in a four-year course with about one-third of the teaching time devoted to commercial subjects, such as bookkeeping, commercial arithmetic, typing and shorthand. Successful students sit for the Sudan School Certificate, which may gain them admittance to the School of Commerce of KTI or to the Faculties of Arts or Economics at the University of Khartoum.) 106

The Girls' Secretarial School provides a two-year course in shorthand and secretarial subjects to graduates of Girls' Secondary Schools to prepare them for positions as bilingual private secretaries. Completion of the course leads to a Secretarial Diploma. 107 A three-year general education course with emphasis on Arabic, English and

---

103 Sudan Almanac, etc., op. cit., p. 155.  
104 Ibid., p. 156.  
105 Education Under National Rule, op. cit., p. 69.  
106 Sasnett and Sepmeyer, op. cit., p. 272.  
107 Sudan Almanac, etc., loc. cit.
typerwriting is available to intermediate school graduates and leads to a Typist's Certificate.\textsuperscript{108}

The four academic departments of KTI provide teachers and syllabuses for the schools of Sudan.\textsuperscript{109}

The Department of Further Education is responsible for the organization of short courses, part-time, day-release, and evening classes. Students may be drawn from any educational source, and from any level. Courses lead to examinations in all fields provided in the other schools, as well as for the Sudan School Certificate and for Civil Service certificates. There are also courses in recreational art and in foreign languages.\textsuperscript{110}

The number of students at KTI has grown from 161 in 1955 to 1400 in 1963.\textsuperscript{111} However, while the number of students has increased, the intake at the lowest level has decreased in recent years. It is also true that the intake at succeeding levels has dropped.\textsuperscript{112}

The Ministry of Education has planned to place into operation a Higher Institute for Laboratory Technicians. The Ministry has requested assistance from the United Nations Special Fund to place the program into operation. The Institute is designed to train personnel to become laboratory technicians for industry and government in biological,

\begin{footnotes}
\item[108] Sasnett and Sepmeyer, \textit{op. cit.}, p. 276.
\item[109] Sudan Almanac, etc., \textit{loc. cit.}
\item[110] Ibid. Also \textit{Education Under National Rule, loc. cit.}
\item[111] \textit{Educational Statistics, 1961-1962, loc. cit., and Educational Progress in Sudan, 1963/64, loc. cit.}
\item[112] \textit{Educational Statistics, 1961-1962, op. cit., p. 48.}
\end{footnotes}
industrial, and related fields of scientific research.\textsuperscript{113}

**Teacher Education**

The Institute of Education, established in 1934 at Bakht er Ruda for the purpose of training elementary teachers for rural areas, now has the responsibility for preparation of elementary, intermediate, secondary, and agricultural teachers.\textsuperscript{114} Besides preparing teachers, Bakht er Ruda performs several other functions which are unique to the Sudan. The Institute conducts experiments with elementary curriculum, produces textbooks, prepares syllabuses, writes teachers' handbooks, sets entrance examinations for intermediate and secondary schools, undertakes inspection of elementary and intermediate schools, holds regular refresher courses for teachers, and occasionally conducts special courses for headmasters, club teachers, adult education officers, and school inspectors.\textsuperscript{115}

**Elementary Teachers**

Because there is a shortage of teachers for elementary schools, several expedient measures are being taken to increase the supply, albeit at a sub-standard level. There is one center in the north which provides six-week courses for two groups of sub-grade trainees each year. In the south there are two centers of this kind, as well as four centers for girls which provide teacher training in the last two years.

\begin{footnotes}
\footnote{Sasnett and Sepmeyer, *op. cit.*, p. 261.}
\footnote{Akrawi, *op. cit.*, p. 261; and Sudan Almanac, etc., *op. cit.*, p. 150.}
\end{footnotes}
of intermediate school. The other three centers recruit their trainees from intermediate school graduates. In 1961-62, there were 311 students in these seven centers. It is planned that these sub-grade or junior elementary teachers training centers will go out of existence when all of the junior elementary schools will have been raised to standard four-year elementary schools. 116

Graduates of intermediate schools may undergo training for full qualification at one of the Elementary Teachers Training Centres—four for men and three for women—all of them branches of Bakht er Ruda—to receive two years of academic and professional training. The Centre at Bakht er Ruda has an intermediate school which feeds it directly. In the south, students at Maridi Centre study for three years, rather than two, in order to acquire proficiency in Arabic. These centers, which had a total of 961 students in 1961-62, produce about 400 teachers each year. 117 In 1963-64, there were a total of 1320 students undergoing elementary teacher training in all 14 centers, standard and sub-standard. 118

Intermediate Teachers

Graduates of secondary schools may enter an Intermediate Teachers Training Centre, of which there are two—one for men at Bakht er Ruda and the other for women at Omdurman. These provide a two-year course including three academic subjects chosen from among Arabic, general science, 

118 Educational Progress in Sudan, 1963/64, loc. cit.
history, mathematics, English, and geography, plus one activity chosen
from among rural education, art and handwork, and physical education, and
compulsory courses in history and philosophy of education, methods, class
management, educational psychology, and practice teaching. In 1961-62,
there were 189 students in these two centers. 119

Secondary Teachers

In 1961-62, the Higher Teacher Training Institute at Omdurman
came into existence as a joint effort of the Sudanese Ministry of Educa-
tion and the United Nations Special Fund. The new institution, which had
been under consideration by the Ministry for a long time, provided facili-
ties for the training of secondary school teachers. It is a co-education-
al residential institution offering four-year post-secondary and in-
service teacher training courses. It is also concerned with studies and
research relating to the secondary school curriculum. As of the end of
December 1966, the Institute was to be handed over to the Sudan govern-
ment, to be under its sole administration. 120

Entrance to the Higher Teacher Training Institute is by competi-
tive examination open to holders of the Sudan School Certificate, with
certain minimum qualifications. Accepted candidates are admitted to ei-
ther the Arts or Science curriculum. The Science curriculum includes mathe-
matics, physics, biology and chemistry; the Arts curriculum includes Ara-
bic, English, history and geography. Science programs carry a full load

of practical laboratory work. Education courses are taken all four years with supervised teaching practice in all but the second year. Completion of the course leads to award of the Secondary Teachers' Diploma. 121

In the first year of its existence, the college admitted sixty students, but the expectation was that there would eventually be places for ninety students, including a few from neighboring countries. 122

Problems

As noted earlier, there is no real shortage of teachers at the elementary and intermediate levels, excepting that some of the elementary teachers are of sub-standard quality. The modification of the educational structure, as outlined in the New Plan, has been delayed until after the junior elementary schools have been brought up to the full four-year standard. In preparation for this, the Ministry of Education has introduced in-service training in order to (1) raise the general standard of junior elementary teachers, (2) prepare them for teaching at full elementary level as a step toward upgrading the schools, and (3) improve the educational quality of the junior elementary schools. In addition, summer in-service courses have been held for various kinds of elementary and intermediate staff, including a course for mathematics and science teachers at intermediate girls' schools. 123

There is a shortage of secondary and technical teachers, especially

123 Educational Progress in Sudan, 1963/64, op. cit., pp. 6-7.
in science and mathematics; in order to cover the required courses, it has been necessary to employ unqualified staff.\textsuperscript{124} In order to alleviate the situation with regard to technical school teachers, KTI has undertaken to train teachers for the new intermediate technical schools and trade schools, besides its other functions.\textsuperscript{125} In the secondary schools, reliance will have to be placed on expatriate teachers for many years before graduates of the Higher Teacher Training Institute and the University of Khartoum are available in sufficient numbers to serve their needs.

One area of concern in many countries is the status of teachers. In the Sudan, this is not a problem. Financially, teachers are on a par with others who have similar qualifications; in other respects, they are sometimes better off. The teacher is a respected figure in the community, particularly in rural areas. Where there has been a flight from teaching in other countries, particularly into government service, this situation existed in the Sudan only in the period just after independence. Indeed, some government personnel move back into teaching, and without loss of status or income.\textsuperscript{126}

Before KTI started its program for technical teachers, most teachers for the technical schools were non-professional graduates (and some non-graduates) of KTI. Most, however, had completed advanced

\textsuperscript{124}International Yearbook of Education, Volume XXVI, op. cit., p. 309.


\textsuperscript{126}Survey of the Status, etc., op. cit., pp. 106-107.
levels of technical education; they learned teaching methods on the job. Increasingly, many are being sent to foreign institutions for advanced training, particularly to schools in England and the United States, and to American University in Beirut, Lebanon. Additional training has also been given in short courses held during the summer months, with technicians from the United States Operation Mission giving instruction in basic methods of teaching and practical directions on workshops.

Mr. Ali, when interviewed by this writer, stated that the status of science education would be enhanced if there were a science teachers' organization in the Sudan. As a matter of fact, there was no secondary teachers' organization of any kind in the Sudan from the time of the military revolution in 1958. The Government Secondary Schools Teachers Union had been dissolved at that time and did not regain official recognition until October 1964, which, coincidentally, was the time of the interview with Mr. Ali. That a teachers' organization has an important role to play in educational development is demonstrated by the achievements of the G.S.S.T.U. since its return to recognition: (1) The Union suggested that the Ministry of Education establish a national council for educational planning which would include all those with an interest in education. (2) It supported the organization of education on a local basis. (3) It succeeded in convincing the Ministry of Education to form a national council for private education. Perhaps there are needs for other teachers' organizations with special interests,

127 Educational Data: The Sudan, op. cit., p. 7.
129 Government Secondary Schools Teachers Union, op. cit., p. 27.
including one for science education. These could serve to strengthen special areas of education, in the manner demonstrated by the G.S.S.T.U.

Problems and Needs in Sudanese Education

The major problem in elementary education is that of providing quality education for all of the elementary school-age children in the Sudan. Elementary education is not compulsory in the Sudan, and is not likely to be while the junior elementary schools remain sub-standard and unable to take all who want elementary education. Indeed, the New Plan for a six-year elementary sequence is not likely to come into being so long as the present four-year plan remains unfulfilled.

Science education at the primary level is limited. However, if present plans to require all elementary teachers to have four years of post-secondary education are combined with upgrading of present teachers, there is every likelihood that elementary science may reach the level found in a good American elementary school.

Excepting for the limited number of spaces and the fact that it is not free, intermediate education has few problems in comparison with the other levels. From the point of view of this paper, the outstanding problem is the absolute lack of any science program in the intermediate school. This writer has been assured by two Sudanese whom he interviewed (Mr. Ali, teacher of physics at Bakht er Ruda, and Mr. Gasim, former intermediate mathematics teacher, now teaching technical science at KTI) that they are much concerned about this problem, and hope to

---

become involved in action to introduce a full-fledged general science program in the intermediate schools.

The most pressing problem in secondary education is that of providing more space for students. Secondary education is not free, although fees cover only a small part of the cost. The shortage of space leads to the unhappy situation of having six thousand students sit for an examination which will permit the first three hundred to enter academic secondary education, with lower scorers being permitted to enter technical or trade schools, but with most intermediate school leavers entering no post-intermediate education at all.

The poor situation with regard to secondary school mathematics and science teachers has already been discussed, as well as problems concerning teaching methods, laboratory facilities, equipment, and textbooks. The situation is somewhat the same for technical schools, which have the additional problem of finding fully qualified personnel with professional preparation for teaching.

Other problems in Sudanese education are (1) the problem of vernacular teaching in the south, with its more than 100 languages, (2) conversion of the medium of instruction to Arabic in all of the schools, (3) education of girls at all levels, (4) the "brain drain" from the Sudan, mentioned in an earlier chapter, and (5) implementation of the New Plan.

Assistance in solving these and other educational problems has come from many sources, among the (1) the United States Agency for International Development, which has aided vocational and technical

\[131\] Ibid., p. 23.
educational development with respect to teacher training programs, con-
struction and equipment of facilities, improvement of curriculum materi-
als, introduction of vocational training for all intermediate school
students, improvement of library facilities, and textbook revision, and (2) UNESCO, which has provided technical assistance missions to work
toward programs in adult education, primary education, vocational and
technical education, as well as science education programs at secondary
and university levels.

Summary

The Republic of the Sudan has made remarkable progress in pro-
viding education for its people. The Institute of Education at Bakht er
Ruda and the Khartoum Technical Institute are unique in Africa; they
have gained a well-deserved fame, and merit a place of honor among re-
spected educational institutions in the world. That many students from
other areas of Africa and the Middle East come to these schools indi-
cates the respect which is their due.

In other areas of education, the growth figures indicate that
much of the national effort is being directed toward the improvement and
expansion of education. The growth stems from an interest in education
which started under British colonial rule and continued during the three
year period of independence, the military government, and the present
government. There are many problems to be overcome, as been indicated

---

133 "International Aid to Africa," in Education in Africa, op.
cit., pp. 16-17.
in this chapter, but it appears that progress will continue to be made so long as political stability continues to improve.

The single major problem which bedevils the government, and, concomitantly, educational growth, is that of unification of north and south. The racial, religious, ethnic, and linguistic differences which divide the northern six provinces from the southern three provinces have led to political disunity, racial discrimination, and the reaction to it, inequality of educational and vocational opportunity, and overt violence. If national and educational progress are to be maintained, the rights of Sudan's southern citizens will have to be recognized by the controlling northern government, and sincere attempts to redress political and social evils will have to be made. Given such an effort, the plans of the Sudanese government for educational growth will be such as to serve the needs of all of the citizens, and will progress all the more rapidly.
CHAPTER VI

EDUCATION IN AFRICA—Part 2

Science Education and Technological Growth

The most immediate task confronting the political leaders of newly independent African nations is the economic development of their respective countries. The lack of educational opportunity and the resultant shortage of technicians to service an expanding technological society are viewed as major obstructions to the emergence of true independence. As stated by Léopold-Sédar Senghor, first president of Senegal, "An underdeveloped country which has achieved nominal independence cannot acquire real independence if it remains underdeveloped."¹

In his discussion of western technological assistance to the developing countries of Africa, Rivkin stresses the role of the human environment:

Technological assistance must operate in the whole context of the total human environment of the growth process. It must look at the human factor in that process not only in terms of specific elements—the agriculturist, the industrial worker, the technician—but also in terms of the whole population of which those elements are components. . . . No amount of external assistance can keep a development process going where the population as a whole is psychologically unprepared for a market economy or physically unprepared to take part in modern production or unaware of basic modern skills. . . . Therefore,

¹Léopold-Sédar Senghor, "A Community of Free and Equal Peoples with the Mother Country," Western World (Brussels), No. 18 (October, 1958), pp. 41-42, quoted in Rivkin, op. cit., p. 7.
a fundamental common task for all such areas is the creation of a human environment conducive to the development process.\textsuperscript{2}

Of direct concern to this paper is the educational aspect of the human environment of which Rivkin writes. More to the point, we are concerned with science education and technical education, and the role they play in the social, economic, and cultural growth of the African nations. Some of the trends and changes which are taking place in science education as it is related to technological growth are as follows:

1. In the past, the prestige of manual and technical work was low among Africans; even today, this is so, and relatively few students enter technical schools as a first choice.\textsuperscript{3} Nevertheless, more and more Africans are beginning to see technical education as a means toward raised standards for themselves and for their countries.

2. To meet the needs for technical education, technical schools and apprenticeship centers are being formed all over Africa, not only in urban centers, but also in many rural communities.\textsuperscript{4} As funds become available, plans for new technical schools are being implemented. Not only is help being sought in the West, from "mother" countries, the United States, and UNESCO, but assistance is being sought from and extended by the Communist bloc and by Israel. The Soviet Union, for instance, is involved in construction of technical schools in the United Arab Republic, Guinea, Mali, Ethiopia, and Somalia, as well as in providing on-the-job instruction in industrial, transportation, and agricultural

\textsuperscript{2}Rivkin, op. cit., p. 170. \textsuperscript{3}Kitchen, op. cit., p. 411. \textsuperscript{4}Joyce, op. cit., p. 56.
projects, and in assisting in teacher training. Israel is being viewed by many African (and Asian) countries as a state with an advanced technology, capable of and willing to extend assistance in furthering the technological needs of these nations. Surprisingly enough, when one considers the present attitude of Arab countries toward this Jewish state, an agreement was reached on November 24, 1960 between Israel and the predominantly Moslem Republic of Mali providing for Israeli technical assistance in, among other things, the development of technical education.

3. There is increased emphasis on technical education, rather than on academic education. As one writer states, the immediate need in underdeveloped countries is for technical education and not for formal schooling. The Educational Conference of African States, held in Addis Ababa on May 12-25, 1961, recommended that, while primary education should be of a general rather than vocational nature, manual tasks should be included in the curriculum in order to instill in the pupil a liking and respect for manual work. Some countries are introducing secondary schools with general academic studies augmented by vocational training; in Nigeria, this takes the form of the secondary modern school patterned after that of England. In recognition of the fact that

6Rivkin, op. cit., p. 80.
7Elliot H. Lieb, "What's Wrong with Education in Africa," Overseas, III (November, 1963), p. 3.
9Crookall, op. cit., passim.
existing facilities for the training of technicians at the post-school-certificate level are inadequate to meet the demands of its expanding economy, Nigeria plans to set up technical institutes to increase the annual output of technicians. Also, Nigeria has plans for increased training of artisans. As seen earlier in this paper, Cameroon has already taken steps to augment the training of technicians. As for the Sudan, its Khartoum Technical Institute is already renowned and has yet to reach its full potential. One may readily infer that other nations of Africa are similarly implementing plans for expansion of technical training facilities.

4. Steps are being taken to meet the need for trained technical teachers. As of 1961, Africa did not possess one establishment for the training of technical and vocational teachers. Indeed, "it is easier to find foreign teachers to teach languages, mathematics, Latin grammar and similar accomplishments, than good instructors in foundry techniques or electricity, good masters of industrial design and applied science and good workshop foremen except in training courses organized by industries." It is even more difficult to find native technical teachers. As noted earlier, Sudan has taken steps to supply in-service training for technical teachers. Guinea has started a 23-month course, with four weeks of practical work in industry or in a planning office, for the training of assistant technical teachers. In Ghana, special methods

---

11 Asia, Arab States, Africa, etc., op. cit., p. 57.
courses have been placed into effect to strengthen the foundation of science and mathematics, particularly in connection with trade courses and technical institutes. "In mathematics, considerable emphasis has been placed on teaching by induction and on the mathematical laboratory. In science, a thorough endeavor has been made to stress the importance of demonstration, practical work in the laboratory, design of apparatus, scientific method, and the use of teaching aids." In Nigeria, the Ten-Year Plan calls for federal grants to be given to the various regions "for the expansion of Technical Institutes and for the recruitment of suitably qualified teachers to promote scientific and technical education." At present, for the most part, technical teachers are drawn from the technical institutes from which they graduate, usually after having had some experience in industry, but without professional training in education.

5. There is a trend toward increased emphasis on study in the sciences at all educational levels. In 1961, the Educational Conference of African States recommended that emphasis be gradually shifted from philosophical and literary subjects to the exact sciences and their practical application. The Conference felt that, at the time, too little weight was being given to studies based on the natural sciences. At the university level, there was greater preoccupation with arts, law, and social sciences, than with natural sciences, engineering, agriculture

---


14 Educational Development: 1961-70, loc. cit.

15 "The Educational Conference, etc.," op. cit., p. 114.
or medicine. At the secondary level, there was a shortage of technical institutes and farm schools, and a failure of many of the general secondary schools to make adequate provision for the teaching of the natural sciences. In the primary schools, too little time was set aside for the teaching of handicrafts and nature study, both of which furnish some preparation for further technical and scientific studies. 16

At the Meeting of Experts on the Adaptation of Programmes of Secondary Education, held in Tananarive under the auspices of UNESCO from July 2 to 13, 1962, it was said of the objectives of the general secondary education program that they

must awaken the curiosity of the young African in all fields of science, must enable him to be fully conscious of his duties as a citizen; must enable him to know deeply his national and regional environment, tighten his links with his cultural patrimony and thus, widening his horizon in the world of culture and continuous scientific progress, it will give him the sentiment of universal solidarity. 17

That a shift toward study of the sciences is taking place is attested to by the fact that increasing numbers of African students who are studying abroad are engaged in scientific and technological studies. 18 Also, it seems, the preference for higher studies in law and the letters because of their prestige value is gradually giving way to a desire for education in the sciences; the high demand for scientists and upper-level technicians to satisfy the developmental needs of the new nations has created a new elite with considerable prestige.

16 Greenough, op. cit., p. 39.
18 Kitchen, op. cit., passim.
6. Indirectly affecting the growth of interest in scientific studies is the increased emphasis on secondary education, as such. In 1961, the proportion of pupils enrolled at various levels in schools in 22 countries in tropical Africa was as follows: 96.12% in primary, 3.06% in secondary, and 0.82% in vocational schools.\textsuperscript{19} It is obvious from these figures that the drop-out rate is extremely high both within and after the primary school. Most nations are taking steps to combat the drop-out problem and the imbalance in the educational ladder by increasing facilities for secondary education, and in many cases, by making it first fee-free and, eventually, compulsory.

**Educational Finance and External Assistance**

Expansion of educational facilities is hindered by the shortage of finances available to the central governments for such purposes. Nevertheless, educational programs are moving forward because African nations are devoting large proportions of their budgets to education, and because much assistance, of various kinds, is available from external sources.

For instance, France's Fund for Aid and Cooperation has already spent millions of dollars to implement the resolutions of the 1944 Brazzaville Conference, and plans to continue this aid to its former colonies.\textsuperscript{20} Aid is also offered to her former colonies by England; mention has already been made of the assistance programs of Russia and Israel; Italy and Egypt are also among the nations which extend aid to African

\textsuperscript{19} *Asia, Arab States, Africa, etc.*, op. cit., p. 67.

\textsuperscript{20} *Kitchen, op. cit.*, p. 405.
University scholarships are available to qualified African students through such organizations as the African Scholarship Program of American Universities (ASPAU), the United States Agency for International Development, and the Institute for International Education.

In 1961, the Conference of African States produced two carefully worked out plans for the development of education in Africa: the Short-Term Plan, 1961-1966, and the Long-Term Plan, 1961-1980, the bulk of the costs to be borne by the African states and the deficit to be financed from external and international sources.

The short-term Five-Year Plan calls for raising primary school enrolment from the present overall average in Africa of 40 per cent of the school-age population to 51 per cent during this period, i.e. from a little over 11 million pupils to about 15 million; and for increasing secondary school enrolment from the present figure of about three per hundred of the age group, to nine per hundred, i.e. from some 800,000 pupils at present to something like 2,500,000.

The Twenty Year Plan calls ultimately for the establishment by 1980 of universal primary education throughout Africa; for the enrolment at secondary school level of 30 per cent of children leaving primary schools; and for higher education, mostly in African institutions, for 20 per cent, or one out of every five young people completing secondary education.21

Trebling the numbers of students in secondary schools means that the numbers of teachers for these schools must also grow in proportion. Making an important contribution to that growth is the Special Fund of the United Nations. The Special Fund was created on January 1, 1959, and by 1962, it had developed into the largest technical cooperation program of the United Nations. The function of the Special Fund is to assist underdeveloped countries in accelerating their economic growth

21Greenough, op. cit., pp. 41-43.
by sponsoring projects which will enhance their attractiveness to public or private capital investment. Of the several fields of application, that which relates to this paper deals with manpower training and technological education. Special Fund assistance in this field concentrates on training instructors and other high-level teachers to produce the most rapid dissemination of technical and professional skills. ²²

One-fourth of the projects entrusted to UNESCO by the Special Fund relate to secondary teacher training. African Institutes in Teacher Training have been set up in eleven African countries and the United Kingdom. It is planned that, over a five-year period, between 6000 and 6500 secondary school teachers will be trained in this program. ²³

Over 75% of the funds spent by the Special Fund for the Institutes is for services of experts. This implies a need for such experts from the better developed nations, and indeed, these are the sources which provide them. As part of a plan suggested in 1960 by the Assistant Commissioner for International Education of the U.S. Office of Education, it was suggested that the United States would provide "an average of 500 American teachers per year for ten years in such fields as teacher training, elementary and secondary education, vocal education, trade and industrial training, English language, linguistics, science and mathematics." ²⁴ Indeed, between 1953 and 1963, a total of 284 American science educators and teachers served in more than 350 overseas

²³ W.J. Ellis, "Secondary Education in Developing Countries: Cooperation between Unesco and the Special Fund," Unesco Chronicle, XI (June, 1965), pp. 229 and 231.
²⁴ Caldwell, op. cit., p. 146.
missions supported mainly by AID, but also by some thirty other foundations and agencies. Approximately 45 of these missions were in Africa. In addition, some 900 Peace Corps volunteers have taught science in foreign secondary schools and universities, many of them in Africa. Of special interest in this regard is the Committee on Natural Science of the U.S. National Commission for UNESCO, whose principal concern is "the bringing of science into some meaningful relationship with the peoples of many of the underdeveloped countries of the world." This function is directly in line with the general aims of UNESCO and the Special Fund, as noted earlier.

An organization which has performed work related to the status of teachers, their organizations, and their representation at the international level, is the World Confederation of Organizations of the Teaching Profession, which has no individuals as members, but only teachers' organizations. Among projects carried out by the WCOTP are a study on "Science Teaching in Various Parts of the World," a study of the Unesco Source Book for Science Teaching, with a view toward expanding the content in biology and earth and space sciences,

---


coordinating of in-service training schemes in Africa which have involved over 4000 African teachers over a five-year period, coordination of summer training courses conducted by Canadian and Swiss teachers for French-speaking African primary school teachers and by Canadian teachers for English-speaking teachers, and sponsoring a meeting in Tunisia in March 1967 to discuss the responsibility of teachers in a developing country.

Although the above list of organizations and educational schemes is far from complete, it serves to indicate the kinds of assistance, financial and otherwise, which are being extended to the underdeveloped nations of Africa (and elsewhere) to aid them in educational development.

---

30 Ibid., p. 20.
CHAPTER VII

SUMMARY AND CONCLUSIONS

This paper has engaged in a broad examination of educational structures in Africa, with deeper studies of the educational systems of Nigeria, Cameroon, and Sudan. These studies provide background for understanding the status and development of scientific and technological education in Africa. It has been the purpose of this paper to study the educational structures in terms of (1) the development of scientific and technological education, (2) the effect of the colonial pattern on the contemporary educational structure, and (3) the problems, needs, and goals of African education. To these ends, six hypotheses were stated in the introductory chapter; they will be examined and discussed in the pages that follow.

Science Education and Technical Education

Hypothesis 1: The needs of African nations are such that the current emphasis in education below college level is on vocational training rather than upon science education.

In the primary school, such science as is present in the curriculum is most often related to the practical needs of the rural agrarian economy; such time as may be devoted to science is usually no greater than that allowed for manual crafts.

At the secondary level, such emphasis as is present in academic
curricula is usually there for students who are preparing for higher educational studies; the structure of the science syllabus is influenced by the requirements of the secondary school leaving examination.

Although there is increased emphasis on the place of science and mathematics in the curriculum of the technical school, the primary function of the technical school is simply to produce technicians. Although the need for secondary academic education has been duly noted by the respective Ministries of Education, and steps have been taken by them to develop this type of education, a still greater effort has been expended on the expansion of technical and vocational education in most African nations.

When one views the not inconsiderable progress in the development of vocational and technical education in Africa at all levels, and considers that science education has received its major impetus toward growth only at the secondary level, it appears that the emphasis indeed is being placed on vocational education rather than upon science education, and that therefore, the first hypothesis is valid.

**Hypothesis 2:** Science education in African nations has higher prestige, and therefore greater priority, at higher educational levels than at other levels.

Insofar as a college or university degree is more prestigeful than a secondary school certificate or diploma, so much does science education at the college level carry more prestige than science education at the secondary level. However, although new colleges are coming into existence in Africa (and with them, Faculties of Science), they are not expanding as rapidly as are secondary schools (with their science curricula). While it appears that the trend at the university level is
toward study of the sciences and away from other more traditionally prestigeful areas of study, the movement toward scientific studies is even greater at the secondary level. It has been shown in this paper that secondary education has been given a much higher priority than higher education in the development of the entire educational structure, and much emphasis has been placed on the provision of laboratories and equipment for the study of science in the secondary schools. If one follows the sum of the first two hypotheses to their natural conclusion, it appears that, notwithstanding the fact that the prestige of the graduate chemist or engineer is higher than that of the laboratory or factory technician, yet the emphasis in African nations is on the preparation of low- and middle-level technicians rather than on the production of upper-level scientists.

The Colonial Pattern

Hypothesis 3: The educational programs (and, concomitantly, science education programs) of the African nations are to a great extent patterned after those of the "mother" nations of which they were colonies.

Since this hypothesis was accepted as valid during the preliminary stages of this study, this paper concerned itself with the manner in which the colonies were influenced by their imperial masters, with particular emphasis on the purposes of colonial education, the structure of this education, its extent, and how the present educational systems of the African nations maintain the patterns which evolved during the colonial period.

The text of this paper has presented a considerable amount of evidence to indicate that former British territories have established
educational systems patterned after that of England, and that former
French territories have patterned their educational systems after that
of the French metropole; some additional information about former colo-
nies of Belgium and Italy and present colonies of Portugal and Spain in-
dicate that all countries of Africa have followed the educational pat-
terns of their former (or present) rulers.

It has also been shown how the Moslem religion has influenced
secular education by giving it a Moslem religious and cultural flavor in
countries like the Sudan and in Moslem areas like Northern Nigeria, how
Islam has acted to retard the spread of secular education, and how the
education of girls has proceeded much more slowly than that of boys. It
is apparent that the education of girls receives less attention every-
where in Africa, but this has been more pronounced in Moslem areas.

What is new and unexpected is the current upsurge in Africaniza-
tion of the educational systems. It is to be expected that African na-
tions would prefer to have their own nationals teaching in their
schools, and much effort is being expended in this direction. However,
it is in the area of curriculum that many other changes are being made;
typical changes are emphasis in the syllabuses on African history and
culture, use of the vernacular in primary schools and even extending in-
to higher levels of study, and revision of textbooks (particularly in
science) to give them an African bias and flavor. African intranational
and international educational organizations are exerting influences to-
ward Africanization of the schools and are showing concern for problems
which are strictly African. Yet, beneath the drive toward Africaniza-
tion, the colonial pattern remains to give structure to the system.
Problems of African Education

Hypothesis 4: Many of the problems of science education are common to many of the individual African nations.

The validity of this hypothesis has been well established in this paper. Many problems related to the broader aspects of education are common to all of the African nations, except in some minor specific areas. Some problems are more severe in or peculiar to some areas, e.g., nomadism in desert regions such as in the Sudan and Somalia, language difficulties in southern Sudan and in rural areas of other nations, and the resistance to secular education in Moslem areas.

With respect to science education, however, there is little difference in the nature or severity of the problems. Some of the problems, both those in science education and those of a general educational nature, are summarized below.

Problems in Science Education

1. For too long, more prestige has accrued to secondary school and university graduates with classical academic preparation than to those with preparation for careers in scientific fields.

2. Emphasis on rote memorization detracts from the ability of the student to grasp scientific principles and from his potential for independent discovery in science.

3. It is difficult to have acceptable science teaching programs when there is a shortage of facilities for the teaching of science.

4. There is a shortage of both secondary science teachers and technical teachers. There are almost no facilities for training
technical teachers, and few technical teachers have had any preparation for teaching in schools.

5. Most secondary school science teachers are expatriate.

6. The elementary school level has almost no science offered other than hygiene and rural science.

7. Elementary school teachers are inadequately prepared to teach science.

8. There are few, if any, facilities for teaching science in the elementary school.

9. There are many secondary schools with inadequate facilities for student experimentation.

10. Many secondary schools do not offer science up to certificate level.

11. In some areas, there is a shortage of science textbooks and supplementary source books.

12. Many science textbooks are based upon the European environment, rather than upon that of Africa.

General Problems

1. There is a conflict between the desire to maintain the use of local vernaculars and the necessity for employing a world language for purposes of education, communication, and unification.

2. There is a shortage of well-trained teachers at all levels. Most countries are forced to tolerate sub-standard teaching at the primary level because primary education is expanding at such a rate that the training of fully certified teachers cannot keep pace. At the
secondary level, most teachers are university graduates with little or no training in teaching methods and psychology.

3. There is a shortage of school buildings, with the greatest problem at the secondary level.

4. Implementation of plans for educational expansion is hindered by a lack of adequate financing.

**Needs of African Education**

**Hypothesis 5:** Many African nations have common needs in science education.

Practically all of the educational needs are common to every country of Africa. This is as true in the teaching of science as it is in virtually every other aspect of African education. Some of these needs in science education, as well as those of a general nature, are outlined below.

**Needs in Science Education**

1. The teaching of science needs to be made more effective by replacing the lecture method, with its undue emphasis on memorization, with methods which involve the student somewhat more in self-discovery. These need to be reinforced by student experimentation and class discussion.

2. There is a great need for science laboratories and equipment.

3. Science textbooks, particularly in biology, need to be brought into closer relation with the local environment. There is also a need to bring them up to date.

4. There is a need for science libraries which are available to
students for purposes of individual study.

5. There is a need to develop native science teachers for the secondary schools, and to give them a thorough academic and professional preparation.

6. There is a need for more science at all levels.

7. There is a need for secondary school teachers to learn the use of laboratory equipment in order to render more effective their own teaching.

General Needs

1. There is a great need for expansion of secondary education.

2. The greatest need for secondary school expansion is in facilities for technical education.

3. There is a need for more and better trained teachers at all levels.

4. There is a need to develop means for preventing the great loss of potentially valuable workers which results when students drop out of school at any level.

Goals of African Education

Hypothesis 6: Many African nations have common goals in science education.

At the present time, education in Africa is pointed toward the improvement of the social and economic lot of the people. Therefore, the goals of education are affected by this service aspect to a degree not seen in the United States.

Thus, a major goal of most African nations is the manifold
expansion of scientific education as a means toward attaining the larger goal of economic improvement. Even greater emphasis is being placed upon the expansion of facilities for technical education.

Interestingly, most African nations share a "non-goal"; few if any, are placing much emphasis on the teaching of science in elementary schools or on enabling elementary school teachers to acquire academic preparation for science teaching.

A major goal of most African nations is to effect a shift in emphasis away from classical education and toward scientific education at the secondary and higher educational levels; many national education plans include figures which denote the degree of shift desired over a period of years.

**General Goals**

Probably the greatest desire of African educators is to effect a return to African, national, and local culture and values in their educational systems. As a reaction to recent colonialism, there is a strong search for national and continental identity. In working toward attainment of the goal of Africanization, educators are striving to emphasize African history, geography, and arts in their schools at all educational levels.

Another related goal is the complete Africanization of the teaching staff. Although expatriate teachers will continue to supply the bulk of secondary school and university faculty for many years, they are gradually being replaced by native teachers.

Finally, the goal of all governments is to make education at all
levels compulsory and/or free of fees for those who can benefit from education at given levels.

The Further Development of Education in Africa

Hypothesis 7: If many problems, needs, and goals are common to many African nations, then there should be similarities in the programs designed to meet these problems, needs, and goals.

Before embarking upon any program of educational development, it is necessary to survey the present status of the national system. The Commission on Post-School Certificate and Higher Education in Nigeria and the New Plan for Education in the Sudan are outstanding examples, among others, of efforts to assess the national structure of education and to make recommendations regarding its improvement. Within both of these reports lie important recommendations regarding the problems, needs and goals of science education and technical education.

Virtually all nations have embarked upon steps to expand facilities for science education, particularly at the secondary level, for the training of teachers for all levels, and for technical education. Many are using interim measures, such as sub-standard schools (junior elementary schools in the Sudan), incomplete school levels (National High Schools with only Sixth Forms in Nigeria), in-service training to upgrade non-qualified teachers and to provide new teachers from non-professional sources with some training, and of course, expatriate teachers.

Most nations have joined inter-African and international groups for the study of particular educational problems. Some of the meetings which have taken place and which have already produced tangible results are the Meeting of Experts on the Teaching of Science in Tropical Africa.
(Abidjan, Ivory Coast, 1960), the Conference of African States on the Development of Education (Addis Ababa, Ethiopia, 1961), the Meeting of Experts on the Adaptation of Programmes of Secondary Education (Tananarive, Madagascar, 1962), the Conference on the Future of Higher Education in Africa (Tananarive, Madagascar, 1962), the Seminar on the Teaching of Basic Sciences in African Universities (Rabat, Morocco, 1962), and the International Conference on the Organization of Research and Training in Africa in Relation to the Study, Conservation and Utilization of Natural Resources (Lagos, Nigeria, 1964). These meetings serve to enlighten the participants with regard to the particular problems under study, and help the respective governments to take appropriate steps toward solving these problems within their own borders.

Financing is a problem in every country, for all facets of the governmental economy. Nevertheless, large proportions of national budgets are devoted to education in each country. All countries have had to seek assistance, either through direct financing or loans, or through technical assistance in the form of personnel, materials, or equipment. Probably foremost in organizations which extend aid to education in Africa is the United Nations and its affiliated organizations, such as the Special Fund, UNESCO, the Economic Commission for Africa, the International Bank for Reconstruction and Development, and the International Labour organization, among others. The major source of American aid is the Agency for International Development. Similar aid is forthcoming from other nations, as discussed elsewhere in this paper. Without a doubt, African nations will continue to seek external aid for educational purposes (as well as for other purposes) for many years to come if
they hope to make the progress estimated in their plans for educational development.

It appears to this writer that the goals of African education (and science education) will best be furthered by the kind of inter-African and international cooperation exemplified by instances cited in the previous paragraphs. The cooperative examination of mutual problems and needs serves to clarify them, and to throw light upon the best paths to their solution. The pooling of international resources serves to reduce the possibility of duplication of effort, to lessen the cost to all nations involved, and to make it possible for the less affluent nations to proceed with the tasks involved in the development of their own educational systems.

A final word: nations involved in cooperative efforts toward the solution of educational problems will find it easier to engage in other programs of mutual benefit, whether they be within the sphere of economics, of politics, or of international social and cultural development.
APPENDIX A

1. The Emperor of Ethiopia, Haile Selassie, is greatly concerned with the place of education in the national scheme of elevation of the peoples of his country.

Convinced as We are that education is a vital and proven means for securing the well-being and prosperity of Our beloved people, We have reserved for Ourselves the portfolio of Minister of Education.

Our preoccupations, however, have not been concerned solely with the material welfare of Our people. The development of the resources of intelligence which education draws forth from Our people—vital as it is—without moral inspiration and guidance, can never of itself work for the good of all. Man, who is by nature selfish, must learn that only in serving others can he reach the full stature or attain the noble destinies for which God Created him.¹

2. In a speech given on October 26, 1960 before the Legislative Assembly, President Kayibanda of the Republic of Rwanda gave recognition to the importance of technical education in national development. (The following has been translated from the French by this writer.)

It is not uniquely a matter of material standing, but equally of the social and spiritual life in the nation.

Also, my Government, aided by technicians will endeavor to put upon its feet a concrete plan—realistically long-term—consisting on the one hand of removing different obstacles to national development, and on the other hand, of realizing to its utmost possibility a progress as much material as social and spiritual.

It is within this integrated and harmonious plan of development that will be entered the reforms of the social-

political structure, those of land regulation, those of education. Our Ministries of Agriculture, of Finances, Economic Affairs, and Planning, of National Education, and of Social Affairs will be the great artisans of the raising of the living standard of the people.

Formation of qualified workers and of socio-technical groups, promotion of the different traditional cultures, organization of the farmers and of the artisans, promotion of new ideas, with a view toward rendering the people receptive to new structures and methods—all will be as important as any other points which form part of our program.²

3. Mr. Abdelkrim Benjelloun, Minister of National Education in the Kingdom of Morocco, states that, "Our main concern is to provide a general educational system by giving it a real national character, by increasing its effectiveness and widening its field of action."³

4. His Majesty Mohammed V, King of Morocco, emphasizes the role of technical education. According to his statement, "If we want to provide a general education for all our children, we must first of all train sufficient staff to satisfy the needs of our independent country, not only in the administrative field, but also in the technical, industrial, and economic fields."⁴

5. Abdinur Yusuf, Head of the Planning Section of the Ministry of Education in the Republic of Somalia, in a letter to this writer, described his country's plans for unification of the system of education, using a single common tongue.

²"Discours Prononcé le 26 Octobre 1960 devant l'Assemblée Legislative," in Le President Kayibanda Vous Parle (Kigali, Rwanda: Le Service de l'Information, July 1, 1963), pp. 1-10.


⁴Ibid.
This country is formed of the ex-British Somaliland in the North and the ex-Italian Somaliland in the South, hence the two parts of the country are following two different systems of education. In the Northern part the English system is followed. In the Southern part of the country the Italian system is still being followed.

In the Northern part of the country, the medium of instruction in the elementary schools is Arabic but that of the intermediate and secondary schools is English.

In the Southern part of the country the medium of instruction of the elementary schools is Arabic and that of the intermediate and secondary schools is Italian.

We are planning to unify the two systems of education so that in both parts of the country the duration of the three pre-university stages will be 4, 4, 4, besides, as soon as the national script is made we would like to make Somali language the medium of instruction in all the elementary schools and English that of the intermediate and secondary schools throughout the republic.5

6. In a speech delivered at the opening of the British Science Exhibition in Ghana in 1962, President Kwame Nkrumah spoke of Africa's need for scientists, and the role of education in supplying this need.

We now live in the twentieth century, the age of the atom, jet propulsion and journeys into outer space. We in Africa therefore require to carry out in a decade what it has taken other peoples and nations centuries to achieve. This demands a revolution not only in the existing political and social order, but also in the substance and structure of our education in order that we can keep pace with the swift scientific and technological advance achieved in other parts of the world.

Ghana's need for scientists, engineers, architects and skilled men generally is great. If we are to sustain our industrial and agricultural revolution, and contribute significantly to the progress of the African continent, it must be our clear duty to accelerate our pace many times over and improve existing training facilities for science and technical education. We must ensure that a lively interest in science is created in the children very early in their school life.

Our teachers will have to learn the importance of associating the work in the classroom with everyday life, so that the children realise that science is not something which works only in the laboratory, but is all around us in

5Letter from Yusuf.
nature, and in the things we see in our daily life.

In the modern world it is necessary that everyone of us should understand the basic principles of science and technology. It is not enough to have some people trained as scientists. Everyone must have a basic understanding of the methods and achievements of science.

The purpose of the development of science and technology, the foundations of which we are now laying, is, therefore, the peace, progress and welfare of our own people and peoples elsewhere in Africa and in the world. 6

7. In a speech which he delivered at the Annual Conference of the Ghana National Association of Teachers in 1964, A. J. Duwuona-Hammond, Minister of Education, gave his viewpoint with regard to the central aim of education.

The acquisition and assimilation of facts and the training in various skills necessary for modern living are essential but they are not the end in education. Education should lead the child to discover himself, his powers and capabilities and should help him to unfold these powers and capabilities so as to enable him to live a full life. This obviously transcends the mere acquisition of knowledge and information. It takes the whole of a child as a human being into account. 7

8. President Sekou Touré of the Republic of Guinea, in writing of education and social progress in his country, gives reasons for educational development and the expansion of technical education.

Man's social behavior and economic activities are directly conditioned by the quality of his intellectual, moral, political, and physical education. It is in order to free the youth of this country from all the social evils inherited from the past that our party and its government are anxious to develop educational facilities, and allocate an


important share of regional and national budgets for educational purposes.

The development of technical and vocational education is now an obligation implied in our decision to resolutely engage this country in the struggle against underdevelopment, as it will permit local training of most of the cadres we are in need of.  

9. Major-General J. T. U. Aguiyi-Ironsi, Head of the Federal Military Government and Supreme Commander of the Armed Forces of the Federal Republic of Nigeria from January 17, 1966 until his assassination a half-year later, stressed the belief of his military government in the importance of education, among other things, in the development of his country.

Although the Executive Committees in the Provinces will remain and continue functioning, important issues relating to such subjects as Education, Agriculture, Industry and Health which call for decision at the national level will now be examined by the Central Executive Council. My Government attaches the greatest importance to the question of examining educational, health, industrial and agricultural issues from a national point. We believe there is a need to provide an adequate and uniform educational system, from primary level, upwards to all the sons and daughters of this country.  

10. In the foreword to the Report of the Conference on the Review of the Educational System in Eastern Nigeria, S. E. Imoke, Minister of Education of the Eastern Region of Nigeria, writes of the need for scientific and technical education in a developing nation such as his.

Educational policy, to be serviceable and viable, must be geared to the special needs and aims of a nation. We must
now evolve a policy, a system of education which will pro-duce men and women who will not be out of place in a tech-nological age; a system which will ensure uniform standards; a system which will blend science and technology with cul-ture and spiritual enrichment; a system which will feed our industries with personnel without starving our schools, col-leges, the Church and offices of such personnel, a system which will inculcate in our youth due respect for the land—in short a system which will produce useful, self-confident and competent citizens.10

11. The governor of Eastern Nigeria, Sir Francis Akanu Ibiam, in a message to the Conference on the Review of the Educational System in Eastern Nigeria, emphasizes the need for the extension of educational opportunities to all children, and of the need for a shift in em-phasis from academic education to technical education.

With the emergence of Nigeria to nationhood come prob-lems such as are now before you to tackle and solve. Educa-tional problems are so varied and so inherently intricate that they require all the talent and all the energy that can be mustered to cope with them satisfactorily. In this Confer-ence, such talent and energy abound. It is therefore your privilege, ladies and gentlemen, to leave for posterity a le-gacy that will make history, in the proposed review of the educational system in Eastern Nigeria.

My Government is strongly convinced that there must now be a change in emphasis in its educational system from Gram-mar School subject to technical education, and above all, to scientific and agricultural education. This change will bring in its train an improved standard of living and conse-quently, an improved society.

A review of education in Eastern Nigeria may not neces-sarily include a review of our educational policy, but I personally hunger for the day when it will be possible for all children of school age to have Primary School education in Nigeria and especially in Eastern Nigeria. Whenever such a measure becomes a reality, I have no doubt whatever that the position will not only enhance our technical and agri-cultural education, but also pave the way for a better stan-dard of living and breed a society which will be happier and

In the same report on education in Eastern Nigeria, the Premier of Eastern Nigeria, Dr. M. I. Okpara decries the shortcomings of the educational system. He is quite critical of the state of teaching in agricultural, scientific, and technological education.

The crisis of Education is the crisis of the new generation. Education just barely able to prepare the nation for the exigencies of the past has failed to meet the demands of the present and prepare the rising generation for the future. From official circles there has been no pussy-footedness and I have unequivocally had to condemn the system on several occasions as inadequate for our present and future requirements. Its most obvious shortcomings are firstly, its lack of modern purpose; its neglect of the utilitarian in education; its neglect of the culture in our society; the poor moral content; its weak spiritual content; the increasing absence of parental responsibility; and the inadequacy of a large proportion of the teachers.

Does Agriculture really occupy any place in our Educational System? The answer is simply—hardly. A few schools have what they call Rural Science although you will hardly see any farms. Teachers trained in Rural Science usually abandon the teaching of the subject after a couple of years, once it has helped them to obtain their Senior Teachers Certificate.

In Science and Technology—the indices of modern progress—we have fared no better. Technical schools are very few and far between. Until quite recently, Science was studied only in a few Secondary Schools. There were hardly any Science Teachers, Laboratories or equipment, and most pupils did what has been humorously referred to as book-and-blackboard science. But it is still unknown in any Primary School or Teacher Training College. Yet how shortsighted must be a system that neglects Science and Technology in a technological age.

11"A Message from His Excellency the Governor, Sir Francis Akanu Ibiam, K.B.E., LL. D., to the Conference to Review the Educational System in Eastern Nigeria, held in Enugu from 19th to 22nd June, 1962," in Report, etc., ibid., p. 37.
It is this lack of the utilitarian content in our education that has made it so difficult for the products of educational system to fit into our present society.  

13. In a speech at the Conference previously cited, S.E. Imoke, Minister of Education in the Eastern Region of Nigeria, spoke of the role of education in creating a scientifically literate populace.

Last week, I had the honour of opening a Science Block for a Secondary School in Uyo Province and in the course of my speech on that occasion I said inter alia: "Our aim is to develop a comprehensive system of education which will make the future generations of this country, men and women of intellectual, cultural and emotional maturity--all-round citizens who will not only be able to appreciate our own culture and those of other people but who, through their acquaintance with Science, will also be able to appreciate the many natural phenomena taking place around them. It is to this end that I have convened a Conference to review our educational system and syllabuses."  

14. In his closing speech as chairman of the Conference cited in the four previous quotations, Mr. A. Ikoku, Principal of Aggrey Memorial College in Arochuku, Nigeria, spoke of the need for reorientation of the educational system to the needs of today.

Education is probably the most potent single instrument of change. With a realization of the mistakes of the past, a proper appraisal of the needs of the present, and an inspired look into the future, "as far as human eye can see", it is possible, given adequate resources, human and material, to revolutionize our society. Admittedly, our education needs reorientation. Our syllabuses and curriculum need to be geared to the needs of the age; our textbooks largely rewritten and our whole outlook rooted in the best in our tradition and culture, while we keep our minds open to what is

---


13 S. E. Imoke, "Speech by the Honourable Minister of Education to the Plenary Session of the Conference to Review Educational System in Eastern Nigeria, held in Enugu from the 19th to the 22nd of June inclusive," in Report, etc., ibid., pp. 41-43.
most worthy of assimilation from other cultures.

We must, however, watch against the tendency to condemn everything in the system of education we have had to date. A system that can produce its critics has by that very fact made a significant contribution to human thought and the onward march of man to the ever receding goal we call good.\textsuperscript{14}

15. The importance of technical education in a developing nation has been stressed in the so-called Ashby Report, the Report of the Commission on Post-School Certificate and Higher Education in Nigeria.

Our task is to forecast Nigeria's educational needs up to 1980. We could have approached this task by calculating what the country can afford to spend on education, and by proposing cautious, modest, and reasonable ways in which the educational system might be improved within the limits of the budget.

We have unanimously rejected this approach to our task. The upsurge of Africa is so dramatic and so powerful that proposals which today appear to be reasonable and sensible will in a very few years appear to be short-sighted and timid.

To approach our task, therefore, we have to think of Nigeria in 1980; a nation of some 50 million people, with industries, oil, and a well developed agriculture; intimately associated with other free African Countries on either side of its borders; a voice to be listened to in the Christian and the Moslem worlds; with its traditions in art preserved and fostered and with the beginnings of its own literature; a nation which is taking its place in a technological civilization with its own airways, its organs of mass-communications, its research institutes.\textsuperscript{15}

16. At the inauguration of the Federal University of Cameroon in 1963, President Ahmadou Ahidjo of the Federal Republic of Cameroon spoke of the necessity of adapting education to the needs of the

\textsuperscript{14}A. Ikoku, "Chairman's Valedictory Speech," in Report, etc., ibid., pp. 46-47.

\textsuperscript{15}Investment in Education, op cit. p. 3.
Cameroonian and African culture, rather than to continue the emphasis on European traditions.

As regards the sending abroad of scholarship holders, it will be clear to everybody that the scholastic and university structures, in a word, the content of education, have been set up in the countries of Europe or elsewhere in accordance with their own respected traditions, and to cater for their own students. These are manifestly unsuited for future African institutions which will have their own responsibilities.

We have taken a number of steps towards creating the University, defining its structure and establishing its aims. These aims are based chiefly on the principles of adaptation to the Cameroonian and African context, respect for the cultural heritage and conventions of mankind.

The adaptation we mention takes into account the special conditions obtaining in Cameroon, chiefly the dual culture of the Federation and consequently its bi-lingual nature; it also takes into account the needs of uncommitted countries to have at their disposal as soon as possible an increasing number of young nationals, not only for administrative, economic and social duties, but also to undertake various types of African research. This adaptation will allow young Cameroonians to evaluate and think out anew their own problems, placing them in the context of the problems raised by the present state of the world. It will extend beyond the present structure of the University, to embrace all education.

17. Technical education is also stressed by Ziada Arbab, Minister of Education of the Republic of Sudan, in the preface to an educational report to the president of the republic.

We intend that our system of education should create a generation (of both sexes) with integrated personalities, proud of their Country, its culture and its religion; a generation that does not despise manual work (whether agricultural or industrial), a generation which is also capable of producing great intellectual and artistic works; a generation with the ability to lead the country in fields of thought and work for the future.

\[16^{16} \text{Université Fédérale du Cameroun op. cit., p. 14.} \]
It is noteworthy that we are taking great care of Technical and Vocational education. We are aware that our Country needs technicians and artisans— for upon such persons the Country depends for the development of its economy, its industry, its commerce and its agriculture.  


After years of bitter political struggle for our freedom and independence, our Continent is emerging systematically from colonialism and from the yoke of imperialism. The personality of the African which was stunted in this process can only be retrieved from these ruins if we make a conscious effort to restore Africa's ancient glory. It is only in conditions of total freedom and independence from foreign rule and interferences that the aspirations of our people will see real fulfilment and the African genius find its best expression.

By the African genius I mean something positive, our socialistic conception of society, the efficiency and validity of our traditional statecraft, our highly developed code of morals, our hospitality and our purposeful energy.

This Institute must help to foster in our University and other educational institutions the kind of education which will produce devoted men and women with imagination and ideas, who, by their life and actions, can inspire our people to look forward to a great future. Our aim must be to create a society that is not static but dynamic, a society in which equal opportunities are assured for all. Let us remember that as the aims and needs of our society change, so our educational institutions must be adjusted and adapted to reflect this change.

As you know, we have been doing a great deal to make education available to all. It is equally important that education should seek the welfare of the people and

17 A New Plan for Education in the Sudan, op. cit., pp. c-d.
recognize our attempts to solve our economic, cultural, technological and scientific problems.

19. A message to the Lagos Conference from Alhaji Sir Abubakar Tafawa Balewa, Prime Minister of the Federation of Nigeria, delivered by Aja Nwachuku, Federal Minister of Education, stressed the need for acquisition and application of the knowledge of science and technology in order to utilize to the fullest extent the rich natural resources of Africa.

Today, you are all meeting here to consider the organization of research and training in Africa in relation to the study, conservation and utilization of natural resources.

No occasion can be more opportune for facing this gigantic task. The whole world knows that Africa is rich in resources. The sun that shines above us is a major source of energy still to be fully exploited. The water that fills our streams and oceans is a resource still to be fully utilized. The earth below us with its ores and minerals, its coal and diamond, its uranium and thorium is a treasure still largely to be unlocked. Our forests and timber, our farms and agricultural produce, our sheep and cattle, our birds and fishes are still to yield the protein of which we are so terribly short. But in order to derive maximum benefits from these resources with which nature has so liberally blessed us, we must acquire and apply the knowledge of science and technology.

Mr. President, the countries of Africa have never faced, at any time in their chequered history, a challenge so awe­some and so frightful. If by our joint endeavour we can solve this problem the future will become rosier than ever before.

How can we face this challenge? We want to plan permanently so that we may be able to face the ever-growing challenge. We want to train and develop our manpower, our greatest resource of all. This generation and those following after must be trained. We must have not only high-level manpower, but also the intermediate and the lower category of trained manpower in the whole spectrum of scientific and

technological disciplines so that the resources of our nations may be surveyed, processed, utilized and conserved. 19

20. The Constitution of the Republic of Rwanda is an example of those which guarantee the basic rights of individuals to attain full personality development through education. Pertinent excerpts are presented below.

Title II—Public Liberties
First Chapter. The Human Person
Article 14. Everyone has the right to the free development of his personality, provided that he does not violate the rights of others or violate the public order and the prescriptions of the law.

Article 31. The state and the public collectivities create the conditions and the public institutions which guarantee the education of children.

Article 32. The constitution recognizes equally official (public) teaching and free (private) teaching. At all times, the subsidization of free (private) schools is subordinate to the numerical proportion of pupils and with respect to the agreements concluded between the State and the legal representatives of the pertinent scholastic establishments.

The general cost per pupil in a subsidized school cannot be inferior to that in force in an official (public) school with the same program.

Article 33. Privileges in matters of teaching are abolished and cannot be restored. The violation of this ban may entail the closing of all scholastic establishments where such discrimination is practiced.

Article 34. With the qualification provided by Article 27 of the present Constitution, primary instruction is obligatory for all children at the age of scholarship within the conditions as stated by the law. Up to the age of 15 years, education is free in total or in part for all pupils whose parents are financially incapable of paying the fees. (Author's Note: Article 27 states: "Fathers and mothers have the natural right to raise their children.") 20


The World Confederation of Organizations of the Teaching Profession and presented to the Eleventh Assembly of Delegates at Stockholm in 1962 dealt with Education in a Technical Age. Presented below is the report of the Ghana National Association of Teachers, one of two African member organizations which reported on the state of technical education in their countries. (The other organization was the Kenya National Union of Teachers.)

The Present Position

The aim of the Technical Education Division is to organize a system of education and training which will produce a sufficient skilled manpower, below university degree level, to meet Ghana's needs for the maintenance of existing works, services and industries and for the further development of the country. It provides courses in pre-apprenticeship, crafts (senior and advanced), technical subjects (junior, senior, advanced), commercial subjects, domestic subjects, special subjects, and teacher training. Full-time courses are given in all the above subjects.

There are at present 4 Junior Technical Institutions, 3 Technical Institutes and 1 School of Mines. The total enrollment is 2,994 made up of 2,646 males and 348 females.

Craft and technical courses are included in the training schemes of many government departments and of some private firms and those students who are sponsored by government departments are paid the usual training allowances whilst attending their courses. All students in the senior technical courses and on the advanced craft courses are sponsored and they return to their sponsoring departments or firms during the long vacation and continue their practical training during that period.

Full-Time Courses

At the end of their courses the students taking mechanical engineering, electrical engineering and building sit for the Overseas Certificate examinations of the City and Guilds of London Institute, and may then enter industry to complete their practical training or may proceed to higher national certificate courses in Ghana or the United Kingdom. Students taking the senior technical course in metalliferous mining sit for a leaving examination conducted by the Ministry of Education.
The technical teacher training courses are designed to produce technical teachers of a high standard of teaching principles and methods.

Note: With the exception of the course in metalliferous mining at the Tarkwa School of Mines, all courses are open to both male and female students, but there are no boarding facilities for females at the junior technical institutes.

DAY-RELEASE AND SANDWICH COURSES

These courses are designed mainly for students who have started to serve their apprenticeship. No tuition fee is charged and admission is restricted to candidates who are serving a recognized apprenticeship. The courses are arranged to suit local needs and admission is arranged by the principal of the local institute in conjunction with firms and government departments operating apprenticeship schemes.

EVENING CLASSES

These classes are designed to offer instruction to workers in full-time employment. The majority of these classes are in commercial subjects, but classes are also held for those wishing to sit for the Trade Test Examinations.

TRAINING ALLOWANCES, SCHOLARSHIPS AND BURSARIES

Many students attending courses at technical institutes are sponsored by firms, government departments or ministries who pay them training allowances. Sponsored students are required to undertake practical employment with their sponsoring employers during the long vacation.

Students who are not sponsored may receive scholarship awards.

Financial assistance to needy and deserving students may be obtained through the Independence Fund for Technical Education. This fund was set up by the Compagnie Francaise de l'Afrique Occidentale in commemoration of the granting of Independence to Ghana.

DEGREE AND DIPLOMA COURSES

These are provided by the Universities of Ghana and especially in the Kwame Nkrumah University of Science and Technology.

Degree Courses: Students are prepared for B. Sc. in engineering, pharmacy, agriculture, science, architecture, town planning and building.

Diploma Courses: Provided in all the above courses and also in fine arts and crafts.
 Fees: G100 per annum for all courses excluding examination fees.

SCHOOL OF ARCHITECTURE, TOWN PLANNING & BUILDING

The courses are designed to give the student training in the professions so that his final degree standard is not less than that required by the British professional bodies. Course syllabuses, however, have been modified in content and designed to suit conditions in Ghana.

DEPARTMENT OF FINE ARTS & CRAFTS

A two-year art teachers course at Kumasi College of Technology or at Winneba Training College. Successful candidates normally start studying in the first year of the course but those whose work merits promotion may be promoted at the end of the first or second term to the second year of the courses leading to:

(a) the Higher National Diploma Course (Graduate Level) and
(b) the Art Teacher's Diploma Course (Graduate Level).

The teaching of science in elementary schools has been reorganized and considerable assistance is being given by the United Nations Technical Assistance Program in training technicians for selected projects in Ghana.21

22. The various International Conferences on Public Education, sponsored initially by the International Bureau of Education and later jointly by the Bureau and UNESCO, summarized much of their work in the form of recommendations, which were included in their annual reports. In 1960, the IDE published the recommendations of the Conferences of 1934-1960. Unfortunately, this publication is now out-of-print, as this writer discovered when he sought to purchase a copy. Through the courtesy of Miss Louise Miller, Documents Officer at the United Nations General Assembly, a copy was obtained for the writer. This publication is recommended to those interested in the history of international education and the development of educational policy.

in New York City, this writer was able to copy two of the recommendations which he felt were quite pertinent to this study. Recommendation No. 27, concerning "The Introduction to Natural Science in Primary Schools," was submitted at Geneva on July 9, 1949, and is reproduced below.

The International Conference on Public Education bearing in mind that the encouragement of the scientific spirit of observation and experiment, through the spontaneous interests of children, is one of the foremost aims of education, and that the introduction to natural science is particularly suitable as an instrument for such training, submits to the Ministries of Education of the various countries the following recommendation:

1) That natural science be introduced as from the first classes of the primary school;
2) That even if such introductory study is given as a separate subject, natural science be nevertheless correlated with the teaching of other subjects (language, drawing, handicrafts, etc.);
3) That this introduction to natural science achieve the following objectives:
   a) develop a child's intellect by the use of activity methods based as far as possible on individual observation and experiment,
   b) stimulate the imagination and the sensitiveness of a school child by making him love nature and her beauties and by interesting him in natural phenomena and the various manifestations of life,
   c) support and foster all activity tending to protect and conserve nature;
4) That, since an introduction to natural science in primary schools should be based on observation and experiment, the following be made available in and out of school, for the use of the children, without restricting their initiative:
   a) optical instruments (magnifying glasses, etc.), terraria, aquaria, school gardens, etc. (wherever direct observation is feasible), and
   b) educational films, slides, wall pictures and collections (wherever for any reason direct observation is impossible);
5) That children be trained to undertake group research and to check each other's observation and interpretation of facts;
6) That such research go hand-in-hand with expression in picture and word;
7) That children be encouraged to collect things for
the class or school museum, for which they will have vivid feelings of personal attachment through thus having contributed to it;

8) That support be given to organizing lessons in the open air, which lend themselves especially well to really educational teaching of natural science, and which conform to the demands of educational theory;

9) That preference be given always, not to the morphological or descriptive, but to the functional method, the method which studies the organs and structure of living creatures, and with the problems of the locality; and that living creatures never be observed as isolated units;

10) That the teaching of natural science never begin with lists of names, definitions, classifications, laws, etc., as these should rather be the end-products of observation and experiments which the children have themselves made, and of the knowledge they already possess;

11) That, without prejudice to the above points, curricula be flexible enough to allow for the adaption of teaching to local resources;

12) That, furthermore, if the locality itself is not able to provide certain objects needed for observation, the children be enabled to procure them through inter-school exchanges;

13) That the books used for teaching consist above all of the books containing information so written that it stimulates the children to inquire and observe for themselves;

14) That, among out-of-school activities (walks, excursions, nature clubs), special preference be given to those tending to develop a love of nature and a desire to conserve natural resources by such means as reforestation, the protection of plants and animals, and the battle against erosion;

15) That teachers occasionally describe how scientific discoveries have been made, and tell their pupils something of the lives of those who have contributed to the advance of science throughout the world;

16) That special attention be paid to the training of teachers, in order that they may be informed of the various methods of teaching natural science, and of such phases of a child's intellectual development as may prove of use in their work;

17) That periodical meetings, conferences and refresher courses keep teachers in touch with developments in science and educational theory and method, and with the results of experiments in the teaching of natural science.\(^2\)


The International Conference on Public Education,
Considering that education is incomplete without a study of natural science;
Considering that modern life requires everyone to have a stock of basic scientific knowledge, so that he may the better understand his natural environment and apply scientific discoveries to improving the community's standard of living;
Considering the value that a study of natural science has for the development of moral qualities;
Considering that such a study also brings to light the achievements of international cooperation in the field of scientific research, and thus helps to improve relationships among men;
Drawing attention to the recommendations on the introduction to natural science in primary schools, adopted by the XIIth International Conference on Public Education in 1949;
Submits to the Ministries of Education of the various countries the following recommendation:

1) It is desirable that in secondary schools the teaching of natural science should be as extensive as possible, and in any case should provide a common core of fundamental knowledge for all pupils between 11 and 15 years of age and a wider and deeper study for certain groups of older pupils;

2) The teaching of natural science in secondary schools should provide pupils with basic knowledge about the world and man, give them experience in scientific method, and develop their general culture and sensibilities. Its aims are as follows:

a) teaching children (the adults, parents, and citizens of tomorrow) about the structure, functioning, and care of the bodies of human beings and other living creatures; the nature of the earth on which they live; and the interdependence of living creatures and their dependence on the soil;

b) aiding children's intellectual growth through activity methods designed to cultivate and, if need be, awaken, their capacity to observe, describe, and evaluate (discovering, investigating, comparing, classifying); fostering a love of truth and intellectual honesty, pleasure in work well done, and a liking for order; developing manual skill; developing love for nature and natural beauty, and a respect for living creatures; inculcating the duty to safeguard human and
natural resources;

3) On account of the quite special character of natural science teaching, syllabuses should:
   a) pay greater regard than those of other subjects to regional needs and potentialities, while giving priority to knowledge of man and the conditions of his existence;
   b) give an important place to actual problems concerning food, public and private health, agriculture and animal husbandry;
   c) be suggestive rather than prescriptive, in order that teachers may be free to organize their work in the light of local resources and the individual abilities and interests of their pupils;

4) Sound natural science teaching calls for the greatest possible activity from the pupils, and requires them to observe the facts and study their inter-relationships, to experiment, and to discuss the results, so that they may pass from concrete cases to abstract laws;

5) For such teaching pupils should be provided with adequate and varied material aids:
   a) collections and the means to maintain and enrich them;
   b) funds for securing living or fresh specimens (aquaria, vivaria, terraria);
   c) laboratory materials, instruments for dissection and observation, projectors for still and moving pictures, cameras, works of reference;
   d) centres from which schools may obtain all necessary equipment and materials;
   e) national or regional centres for making, distribution, and exchanging films in collaboration with the teachers concerned;
   f) facilities of access to State and private museums, exhibitions, zoological and botanical gardens, woods, ponds, quarries, mountains, and beaches. The construction and use of teaching aids by the pupils themselves is a practice to be highly recommended;
   g) the use of audio-visual aids is to be recommended provided they form an integral part of the teaching;

7) The teaching of natural science should interest pupils in safeguarding fauna and flora and natural beauty spots, and the creation of national parks to prevent encroachment by agriculture and housing;

8) It is desirable that children should be encouraged to express their thoughts in correct and precise language, and in certain circumstances, by drawing and modeling;

9) School work should be supplemented by the organization of leisure activities, particularly in the form of young naturalists' clubs or societies, enabling teachers and pupils by means of conversations, individual work, excursions, etc., to get to know each other better, widen their mutual horizon, and effectively interest themselves in
problems and experiments extending beyond the classroom;

10) The teaching of natural science requires teachers who have the special qualities of the naturalist and it is therefore desirable that even the lowest secondary classes should be taken by teachers well qualified from the point of view both of their knowledge and their ability to arouse and stimulate the interest of their pupils;

11) It is desirable that educational supervisors be appointed, that is to say, teachers of recognised ability, with the responsibility of guiding a certain number of their less experienced colleagues;

12) Apart from the constant personal effort to increase their knowledge which teachers may be expected to make, it is necessary to offer them inservice facilities for verifying and refreshing their knowledge in the form of courses and conferences;

13) The need should always be kept in mind of coordinating natural science with other subjects such as geography, social studies, history and philosophy, and even literature, through the reading of authors whose best work has been devoted to natural phenomena and problems.23

---

23 Ibid., pp. 114-116.
APPENDIX B

The twelve interviews from which the following excerpts were taken were all of sixty minutes duration; they were recorded on tape and then transcribed. All but one of the African interviewees were students at the Ohio State University at the time of the interview; some have gone on to further study or have returned to their native lands. The interviewees vary considerably in the degree of expertise with regard to educational matters in their respective countries. They have one denominator in common, however; they are all products of the educational systems of their native countries and can therefore speak with some degree of awareness with regard to their own educational experiences. Further, because of their status as the scholastic elite of their respective countries—many are on scholarship or have otherwise been chosen for foreign study—they are in a position of awareness with regard to educational currents in their own countries.

The interviews were conducted in a two-year period from June 1964 to June 1966. Even the last interview is now out of date, since events have moved so rapidly in Africa that change seems to be almost a way of life on that continent.

The interviews will be grouped by country, in the following order: Nigeria, Cameroon, Togo, Sudan. Each excerpt will be preceded by biographical data in order that the reader may understand the relative degree of involvement of each interviewee in the educational
patterns of change and development in their respective countries.

Michael Onyechi Modebe is a resident of Onitsha in the Eastern Region of Nigeria. He attended elementary school in Onitsha and a secondary school run by missionaries in Umuahia. After higher school, he was selected under the African Scholarship Program of American Universities (ASPAU) to study for the bachelor's degree in biochemistry at the Ohio State University.

Mr. Modebe's father was a mission elementary school teacher for a time. He had a brother who was a medical doctor and has a sister who is headmistress of an elementary school.

At the time of the interview, Mr. Modebe had been accepted into the medical school at Stanford University. The interview took place in the office of the author in the Mathematics Building at the Ohio State University in Columbus, Ohio on July 4, 1964.

(In elementary school) we took mostly English, geography, history, mathematics—that is, arithmetic—hygiene, and a couple of other subjects. The only science we studied was nature study. The school maintained a small farm, which we went out to. Sometimes we had to look at the weather, keep a weather chart, and other such things, too. We farmed a little, and studied the effects of different types of fertilizer.

(In secondary school) we studied more mathematics; algebra, geometry, arithmetic. We studied more science: general science, then we branched off to physics and chemistry and biology. Then English more, language and literature, geography and history.

When I came here, I observed that there is more emphasis here on the practical aspect of the work, more so than there is at home. This difference (will be noticeable in a student) from Nigeria who comes and studies here. At least, he will have some handicap in his laboratory work, whereas in his theoretical aspect he may work all right.

More laboratory work (in Nigerian schools would be) much better. In point of fact, I think there should be some rethinking on the whole nature of the program as it is at home right now. I think it is much too dated. A book that was used by my teacher—I used the same book, with very
little revision. There are some demonstrations—there is a
measure of laboratory work—because in your final exam you
have to take and pass the laboratory work—but it is not very
extensive, as extensive as it is here.

In the secondary division, we used to have all sciences
for two periods, and each period was for forty to fifty mi­
utes. We used to have this double period three times a
week. (That is, eighteen hours per week were devoted to
science, five hours per week to mathematics, etc.)

I think the (subject matter) should be much up-dated.
In the laboratory work, the student should be made to be more
imaginative, because most of the work is sort of routine work.

There isn't too much discussion in class. The teachers
will encourage you to come and meet them if you have any
difficulty. But in class there is not too much discussion,
as extensive as I have observed over here.

Our teachers' institutes are run differently from yours;
they are not on the college level. They are more on the
secondary level. People will go to secondary school before
they go to teachers' colleges, or they can leave elementary
school and go straight to teachers' college, but they have
to spend longer periods than those who went to secondary
schools. When they come out, there is what is known as the
low elementary and the high elementary certificates, and it
depends upon which one you procure. Supposing somebody has
finished his secondary education; in the ordinary circum­
stance, most of them will go into colleges. But those who go
into teachers' training schools will probably come out and
teach either in the higher grades in the elementary schools
or the beginning students in the secondary schools.

Most of (the people who teach in the upper levels of the
secondary school) are college graduates. Most of them have
not had specific teacher training; they haven't taken teacher
training courses.

The language (used in the elementary school) will be the
local language for the first two or three years. Then you
start using English in school, introducing it at first gradu­
ally, and then after it becomes the predominant language, it
takes up all the time. (In the secondary school) the medium
of instruction is English.

(In the secondary school) they need more teachers—
well-qualified teachers—and better equipment, more labora­
tories, more periods devoted to laboratory teaching, and a
change in the approach—the emphasis, to have the student
participate more than he does presently in the learning pro­
cess.

Right now, there is no real science teaching in the ele­
mentary school. I think there ought to be. The curriculum
could be changed sufficiently to include basic science. I
think that by the time somebody (goes) to secondary school
(he) should be made aware of certain things that he will meet
outside in life.
I would call for the expansion of the universities. I would expand the colleges to take a heavy load, and then the secondary school and then the elementary school; I think I would go in this order. I would greatly expand the colleges, because most of the students who are well qualified and who would like to go to college don't get the opportunity, either to go to school at home or to go overseas.

2. David Ajibola Aloba was born in the Western Region of Nigeria and attended elementary school there in a village some 200 miles north of Lagos. After attending secondary school, he entered the Civil Service in Lagos, which is now his place of residence. After three years as a clerk, during which time he continued private studies, he was sent for training in cooperative studies. That is, he studied to become an inspector for cooperative societies. Under the auspices of the Agency for International Development (AID), he was sent by his department to study insurance cooperatives at the Ohio State University. The interview took place in the office of the author at the Ohio State University on October 23, 1964.

When I went, the system was that you had to spend eight years in the primary school, but the system now is six years. Now you are eligible to go to school at the age of six, and it is sort of compulsory in the Western Region particularly. You don't have to pay; the education is free.

There are four types of education (in the Western Region): the primary, the modern school, the technical school, the secondary school. From the primary school, you can go to the secondary school outright. Now, if you leave primary school and go to modern school, you have no advantage of going to secondary school. But from modern school, you can go to technical school. In the primary school, you spend six years; in the modern school, three years. From modern school, there seems to be some uncertainty as to which way to go, either to the teacher training or to the technical school. Even then, people completing their secondary modern school would like to go to secondary school because there is a sort of value in secondary education. I would say prestige.

In the elementary school, I hadn't any science at all (except) health science. We studied things concerning agriculture: the compost system, rotation on the farm.

I wasn't privileged to take science (in the secondary
school. It was not available. Science was a very costly project in secondary schools in Nigeria, until about some ten or eight years ago. It was a costly venture to the school. To equip the laboratory it cost much. The equipment of laboratory is such that it prevented the local schools that could have been taking science to give it at all. Many of the pioneer secondary schools of today give it to their students, and the government schools. But for other private schools, you can't find it.

A lot of secondary schools now are teaching science subjects. (They have equipment and laboratories) but they are subsidized by the government. The secondary school is a preparation for the university.

(There are requirements that teachers have to meet in order to teach in the schools.) After elementary school, (they) go to modern school, (then) to teacher training school. (After graduation from the teacher training school, they) are qualified to teach in modern secondary schools, and down. (The preparation for teaching in the elementary and in the modern secondary is the same). In certain odd cases, people leave modern secondary and go to teacher training for four years. The subjects they get there are all related to secondary modern and elementary schools—no science subjects are taught there at all. But there are some exceptionally bright teachers among them who go to secondary schools, but they don't teach science there. All these teachers, after they graduate from the teacher training school, are styled "grade two teachers." Now if they go for advanced training for three years, they are able to qualify as "teachers grade one." In that advanced training school, I think that these teachers could be prepared to teach science subjects. The teachers in this advanced teachers' college can get (to teach) in secondary schools.

A high school graduate, if he has high marks, (might be used) to supplement the staff strength. These sort of people would teach the lower classes of the secondary schools. (They) could teach the lower three or even four years. (At the upper level of the secondary school are mainly) people who have gone through the advanced teachers college, or college graduates. And the college graduates are not necessarily trained in their job. What I mean is this: If one is going to be a teacher, I think (he) should actually be instructed in teaching. And somebody qualifying from a college as such doesn't necessarily mean that he is qualified to teach. You have masters who know their subjects, but imparting it is another thing. In order to guide people, a teacher must be able to guide students as to what to do. This thing has sort of scales in the salary. Those who haven't received professional training—their scale is different from those who have actually got it.

What could make it better? It's a question of having well-trained science teachers. They are not at all available
--there are not enough science teachers in Nigeria at the moment. There were not enough secondary schools that could teach science, and besides, there are many people who are taking science who are not coming back to teach science; they are going into business, not coming into colleges to teach. This is how science could be popular: if the government could take on subsidizing of secondary schools and give some aid to science teacher training, too.

(The supply of textbooks was adequate). They were all British textbooks.

If more people are trained, and if they are more knowledgeable, the country will profit more than in any other thing, more than by bringing in any tangible gift. Because, knowledge is such a thing that you cannot buy. I would have to vote enough money to all the schools who are willing to teach science—it could be laboratory—and give out money to people who want to study science subjects—especially teachers—teacher training—so that these people could come back to teach science.

3. Jephthah Anozie Abara is a resident of Owerri, in the Eastern region of Nigeria. He attended elementary and government secondary schools in Umuahia, and then went on to higher school. After higher school, he taught physics and mathematics in an Anglican mission secondary school in Umuahia. At the time of the interview, he was studying chemical engineering at the Ohio State University under the auspices of ASPAU. The interview took place in the office of the author at the Ohio State University on October 31, 1964.

The major things that we were taught (in elementary school) were normally called rural science. Perhaps that is more for agriculture. We had some nature study, too. We learned about the plants and leaves and insects. In the rural science, we would go out into the fields and the farms and try to apply some of the things we had learned in nature study. In nature study, we did more of botany; we did not do too much of zoology. It was never expressed, but it was hoped that the boys would go home and tell their parents what they had learned, and at least point it out to them, even though, in most cases, the parents owned their farms, and it would have been hard for them to apply what they had learned in school to their own farms. But, at least, this made them realize, in a way, the need for fertilizers and such things, because the students could see how these things worked on
their own farms in school, and then they would show their parents how these things would be useful for them.

Some of (the schools) had plantations of bananas and palm trees, and such stuff. There was a particular area cleared, and there was a fence around it, and this was called a school farm. And then the students would have to make their own ridges, and plant the yams, and stake them, while weeding was normally left to the girls, at that time. By the way, the girls would be doing more of needle work, while the boys would be out for rural science. (The girls did have) nature study in the classroom. Rural science was done in the classroom, to begin with, but then, you went out and applied what you had learned. But nature study was an abstraction of the things we had around the campus and our compound.

(The science program in the secondary school) was much more intense, much more planned and diversified. In my own high school, being a government or state school, we had a lot of equipment to work with. This could not have been true of some mission schools or private schools where the finance would not be as much; but in my own school, they stressed very much the science education. In the first year, we did biology and general science. General science is actually a mixture of physics and chemistry, the basic experience. But we didn't go very far into the subject then. This took place in the first two years—classes one and two. In the third year, we broke the general science into two parts, physics and chemistry, and then, we also had biology to go on with.

During the first year, biology and general science had equal periods. We normally have classes from eight to one; that's five hours in the day and twenty-five hours in the week, and of these twenty-five hours, two hours and forty minutes were devoted to each of these. Of course, we had math, and other subjects besides these.

In the third year, of course, we continued with biology. Biology the first year, really, was more a (review) of things we had learned in elementary school, because in elementary school we had studied about insects and plants and leaves, and in biology in class one in secondary school, we attempt to recall what we had learned in elementary school: study about insects, moths, go out into the field on the compound and the campus, try and see these things and really appreciate them, more by seeing them than by just mentioning them in class. We became more practical in class two. We are made to study the different growing stages of seeds. In fact, in class two, we had to write a paper. Each person had to be assigned to one particular seed. You had to plant it, watch it grow, then write a report on it. This was generally a very thrilling experience.

In class three, we went further in biology, so that you came to details of the human body, and study the different parts by themselves. In chemistry, we began the basic laws, like Dalton's theory, and the laws of chemical reactions.
In physics, I think that in most schools in Nigeria they begin with heat, then light, then electricity and magnetism. In physics, you have to keep on doing this for the rest of the three years, class three, class four, and class five, until you get done. In chemistry in class four, in most schools, you start practical work, going to the lab and titrating, and having some practical experience with the theory learned in class. In class five, we get into qualitative analysis. In physics, we also have practical work in classes four and five, with heat, light, and electricity in the labs. Although this is not true of every school—many schools cannot afford too many of these, and much of them is left to the teacher to demonstrate, and there is not enough apparatus for the students to work by themselves.

(On the science part of the Cambridge School Certificate Examination, there is a practical part. For schools which do not have equipment), they have two papers in physics, chemistry, and biology. There is one they call "physics with chemistry". This is a paper by itself, and in this case, you don't have any lab work. The work you do is more of a completion test. You have the theory, prepare to write and solve problems, and discuss experiments. But then, instead of having a practical test, they give you a list of things. Say, they describe a reaction, and you identify what reaction it is. But then, you might never have seen it occur, but from what you have read in books, you can actually tell what they mean. So this is the way they try to overcome that handicap, for those who could not go to school where there was enough equipment.

I would say (that it was a handicap to the students who didn't have the equipment in the schools they attended).

I think that the situation is improving now, because the government is trying to take on the responsibility for all of the schools. Up to about four years ago, they left the management of the rest of the schools up to the missions or the private proprietors, and they only concerned themselves with their own schools. But they have realized that education is for the entire country, or for everybody, and it should be the business of the government, and they are now taking interest in seeing to the welfare of the other schools, by giving subsidies and national aid to these schools, and grants, much more than they did before.

Up to about ten years ago, we had been using books about biology, written by an Englishman. This was really bad, because most of the examples given of both animals and plants were those that would be found in England—well, we had some of them in Nigeria, but not most of them. So we studied things that we didn't actually know about, sometimes. Well, I didn't run into this myself, because I didn't get into high school then. But after that, some people in Nigeria wrote books, and they used Nigerian examples, so we could see these and really work with them.

(People preparing for elementary school teaching) go on
from grade school to teacher training schools (without going on to high school). Some of them go to high school, and from there, they go to teachers training colleges. But some go straight from grade school to teacher training institutions, and there they have two years of study, where they study systems of teaching. When they finish, they are not qualified to teach science in grade school yet. They may go on for two more years to what is called a higher teachers school, or higher elementary, and here they can come into more close contact with science education. (Those who do not go on to the higher teachers school) take mostly the first four classes of the elementary school. Before a teacher can be admitted to teach the higher classes in elementary school, he must go to the higher teachers institution.

In secondary school, most of the science teachers are graduates of universities and colleges. But then, in our own system, we don't have any particular training given to (secondary) teachers before they come to school. I mean, they just graduate from the science department in the colleges and then they come straight on to the high school and start teaching. It's obvious that some of them don't have the tactics to teach; they just know the subject, but then they can't impart it to other students. Some of my teachers were this way. They knew what they were talking about, then it never really struck on the students, because they didn't present their subjects in a very understandable manner.

There aren't any institutions, as such, to train secondary school teachers, unless they do it in college, but there isn't even any allowance made for that, any provision for this type of training. But now, they have built some new schools—and this is true in the Eastern Region—what they call the higher teachers school. They intend that these people will go here who come down to secondary school, and be more qualified to teach then. Some can (go directly into this school from the secondary school), but it's mostly for those who have some experience with teaching in the lower grades of high school, and those who have taught, say, seven years in high school; they go to these.

I don't know of any school that has all graduates. The non-graduates who know their stuff take the first two years, normally. They aren't allowed to proceed beyond these. Sometimes they could be in the third class, but not beyond. It is mainly these non-graduates in high school who go to these higher schools for teachers. They've only had high school science education and all they can do then, they can teach the basic science education to the students in the first two or three years in high school. They will give them a good foundation such that, when the graduate teachers come from the college to teach, even though they are unprepared to teach, the students will be able to absorb this much more then, having got a good foundation in the early years. This is the policy they are trying to pursue. And as I've said, this is
true of the Eastern Region in Nigeria only, so far,
  I think I would spend—if I were given the money and
the choice—most of the money on getting good and well-trained
teachers who know their job and like it, and know what they
are supposed to teach, and get the equipment so they can apply
in teaching these students.

4. Maxwell Ezigbo Nwosu was born in Umuahia in the Eastern Re­
gion of Nigeria, attended elementary school in Egwenga Opobo and a
Methodist boys' high school in Oron. He was employed for one year in
the Ministry of Works of the Eastern Region, then left Nigeria in Au­
gust 1963 to study engineering at the Ohio State University under the
auspices of AID. The interview took place in the office of the author
at the Ohio State University on January 9, 1965.

In the elementary school we didn't do anything that
pertained to science, except hygiene. In nature study we
learned something about plants and animals and some smaller
creatures. In rural science, we went out into the fields,
and looked at the plants. Of course, we didn't go to any
farms, because there weren't any big ones, except those we
did ourselves at the school. The government schools are
really subsidized by the government, and they are well pro­
vided with these facilities. But actually, in every school
they have these school farms, only in the government school,
it's more extensive.

It seems that they are going to introduce other science
into the elementary schools. It's just a plan. They say
they have to wait and get enough science teachers who have
graduated from college and will be able to teach science in
the elementary school.

There's a definite advantage to (the government school,
in terms of science).

When I entered the secondary school, we didn't start
right away with science. We did what we call general science
the first two years, and then we started physics, chemistry,
biology, botany, and other things. (We started these) in the
third form. In biology we used to have three classes every
week, and two lab periods of an hour and twenty minutes—be­
cause each period was forty minutes. It was the same for the
others—physics and chemistry. We had seven periods every
day. (That would make 35 periods a week, of which 21 were
given to science) and five to math, because we had math every
day.

What they plan to do now is to make the whole system
free for the elementary. But right now, Standard 1 and
Standard 2 are free. They are just going in one step: every year they add one class that will be free.

In the high school science, the teacher lectured, but we normally go to the lab for both the lecture and the experiments. (Some of the experiments) we do, especially in physics and chemistry. But in biology, the master normally does it, because the specimens were fewer and the apparatus, so some of the experiments we just observe, and then make reports, read our books, and then write up the experiments.

Some of (the teachers at the upper levels of the secondary school) might have had some training, but some haven't got any. No, they just come out and start teaching. That's where a lot of the problem comes in, because they might know their stuff, but to impart it to another person might be difficult. They don't know the technique of teaching. After a year or two (of teaching), some of them go on to do what we call the Diploma. They go to Ibadan or to Britain; it's a nine-months course. (It's offered at the university) both for university graduates and for other teachers who have had the Advanced G.C.E. which is equivalent to higher school, the extra two years you spend after high school. The G.C.E. is the General Certificate of Education, at the Advanced level. The Ordinary level is equivalent to School Certificate. (Taking the Diploma in Education) means more money for them, or they apply for a higher position, or something like that.

Since we were originally under the British, maybe they thought that all our study and everything would be done in Britain, so the method of teaching was mainly designed after the one they use in Britain. I might say that they do a lot of intensive studying and in a particular course, they go into too much detail, and they cover very little; they little that they cover, they go into it so deeply and they take so much time doing it, you are not able to do a lot of things. So that, for those of us who come to the United States, at first it gives us a lot of problems, because we normally think we are coming to the same—to a country using the same system, and we tend to try to waste too much time on unimportant things. Another thing is the way we take exams at term. Actually, we take two or three exams a year, depending on the school. You could fail the first and the second; if you pass the final—okay, that will be fine. Or, if you pass the first and second and fail the final, you fail. So, people might not study for the first two, but for the final they really study, since it covers the whole course work, so it makes no difference when they study for that. But here (in the United States), when we first get here, we aren't very serious, because we figure that, since they take a final exam, that takes everything into consideration and that really counts. We think that it's the way we used to do it, but we find out that that isn't the case. From my own point of view, I wouldn't say that either (system) is wrong. I would
say that both of them are equally good. For one thing, one goes into very much detail, but it doesn't do very much, but the other covers a lot of ground, but it's not very detailed, especially in the basic courses.

In the elementary school, although they are making plans to improve the teaching of science, I would say that they could at least give them an idea what the science courses are likely to be or what quality so that, at least, they get prepared. Not only doing it in class, but doing it practically, like getting models. Not getting teachers that have just degrees in science, but maybe having a little training in the method of teaching and all this.

In the labs in high school— you only go there when the instructor or the master is there. Anyway, we still need a lot of apparatus, because there are very few of them. In the physics lab, we didn't have enough equipment so that each student could get to use one apparatus fully to himself. I actually feel that we don't have enough equipment. We need that a lot, especially since they are going to introduce science in the elementary school.

Most of the books we use are very old books. They were adequate for the courses, but they're not up-to-date; they're old books. (In the United States) they keep on publishing books every year and they put in new material, while at home they use books published as far back as 1939, 1920—something. Some of the material in them might not be used any longer. They could be changing the books every two or three years after this, and this would make a lot of difference.

5. Ampim Darku Blankson was born in Bakana, near Port Harcourt in the Eastern Region of Nigeria. He attended four different elementary schools, first in Mamfe (then in British Cameroon, administered by Nigeria, but now in the Federal Republic of Cameroon) at a government school, then at an Episcopalian elementary school followed by a Baptist day school in Port Harcourt, and finally at an Anglican elementary school in Kaduna, in the Northern Region of Nigeria. His secondary education was at St. John's College, a Catholic institution in Kaduna. After receiving the Cambridge School Certificate, he taught chemistry in the third form at St. John's College. Since there was no higher school in Kaduna, he spent most of his evenings
as a teacher reading for the Higher School Certificate and the General Certificate, Advanced level.

Mr. Blankson then entered the University College at Ibadan. Upon graduation, he found employment with the Ministry of Information, which included some experience as a correspondent in the Congo during the period of internal strife in 1961. He then entered the Graduate School of Journalism at Columbia University. Following a period of employment as Public Relations Officer for the Economic Plan, he transferred to the Foreign Office, which sent him to New York City.

At the time of the interview, Mr. Blankson was Vice-Consul in charge of the Commission on Cultural Affairs at the Consulate-General of Nigeria in New York City, as well as Press Officer for the Nigerian Mission to the United Nations. The interview took place in Mr. Blankson's office at the Nigerian Consulate-General on June 23, 1966.

I think the nearest approach we had to any form of science, using the word in its widest application was—well, we had classes variously called nature study classes. This is what we did in many of the elementary schools I attended. In nature study they taught about some elements of biology, and that type of thing, which was slightly understandable, because in science, more than in any other thing, the idea of experience—seeing things for ourselves, it's very, very important. But in 1942, when I started school, our country was many, many light years away from what it is now, although the level of science education is still nothing to brag about. But it was even worse, so, we did nature study, mostly biology and the related sciences, in a very assimilable fashion.

In secondary school, it was much different. Because we had the lab—we had more than one lab—we had many labs. We had physics lab, chemistry lab, geography lab, and this time it was theory as well as practice. So, this time I had a very good science education. (One of the reasons that the science teaching at the secondary level was superior was probably because there was a need to answer the requirements of the school examinations), which is a rather unhappy commentary about science education as a whole, in the country. The point is, certain schools, provided that they had
adequate members of the faculty, got some grants from Government, or wherever it was, to run science labs. So, in many of the schools, all they did by way of science was just to have science which is strictly hygiene and physiology. They hadn't the qualified men, therefore they had no labs—so the students were given just anything. Our own school was different. We had a good number of Irish Catholic priests who had read the sciences. But generally, this is the very best type of educational inheritance because, whereas the philosophy of education in Britain—which I don't see changing now—has been to educate an elite, the exact opposite has been the thing in (the United States), where sometimes someone is very astounded—coming from a different culture and a different set of educational values (as in Nigeria), to find that there might be a course in hotel management, of all things. So, the education in Nigeria has been towards educating the elite. Many reasons went into this decision. First of all, the pattern of the British themselves and secondly, the simple fact that money is not available. It wasn't then, and still, even though the country as a whole spends more than 35 to 40 per cent of its resources on education, yet, it's not all-embracing as we'd like it to be, So, many people could not study science because facilities were lacking. And many people were interested in the arts, because, you know, a classical education does give you an approach and does stamp you with a gentlemanly outlook on life, and the British themselves encourage that. You know, if you had a classical education, you could get a good job (but) before you get past the School Certificate level in science, you need a lab. And since we are not an industrial country—a manufacturing country—science is not too strong in the country. So, it has always been easier for many people to read geography and history and get a degree and get a job in and administrative and respectable position than for people to go through science, or even medicine.

Quite a lot of schools did not have facilities. I should imagine the position has changed now. One example I want to give you (underscores) the emphasis the latter-day governments of Nigeria—when we had many governments, that is—placed on science teaching. It was such an extent that, if you qualified in the university in one of the physical or biological sciences, or you wanted to teach, you were given a bonus of 120 pounds, which is a good percentage of your initial pay. So that's how they wanted to right the balance. They give you a bonus of 120 pounds extra, since you are a science teacher, in order to keep as many people (as possible) there, and in order to correct the imbalance that education would have with too much emphasis on the arts.

It is a very fair assessment, a very correct observation of the whole program, (that several developmental studies, such as the one undertaken by the International Bank for Reconstruction and Development which emphasizes the need for
technical education, and the Ashby Report which recommended that more science be taught, and that on the basis of studies such as these, the Nigerian government has moved ahead to strengthen the science program in the schools). The unfortunate thing is that, whereas many other nations in the world had as much time on their hands to develop as slowly as they pleased—and this was essentially because the pace of development in the whole world was very slow until this century—we, a new nation in this century, since we share some aspects of the common heritage with many other nations, and since our people need many things many other nations need. The only way we have to catch up is to strengthen the science program, which has been done to a considerable extent.

But the charm of the white collar job is still very strong, because, like in some other places, some customs and some conventions die very hard, indeed. But, there is a spearhead to right the imbalance in the educational groove, and we've had many more vocational schools. We've got counseling services—these are about three or four years old—trying to divert people into areas of their own aptitude, where they could formulate their career later on from that point. We've got engineering faculties—more of them—in our universities. Much more money is devoted to the building of labs and hiring science teachers all over the country. But yet, as reports and governmental studies found out, these are not enough. We need more, especially managerial and skilled technicians in the intermediate grade, not the policymaking decisions, not the fine manufacturing or inventing grade, but the managerial one to keep factories humming, repair work, and that type of thing.

There have been one or two structural changes in the country. We got independence from Britain in 1960, with three autonomous administrative regions in the country—the North, the East, and the West, and a Federal capital of Lagos. Since this was a federation, there was some agreement as to how powers would be shared within them. Certain subjects were on the exclusive list of the Federal Government, like diplomatic practices, diplomatic relations, currency, defense, communications, the army, the air force, the police force, and some aspects with regard to technological and post-secondary education. The other three administrative regions had their own power to formulate legislation and execute policies on education, health and social welfare, trade—to mention some areas in which they had competence—according to the Constitution of 1960. But in general this year, we've had a change in government. There was some disorder among the middle echelon of the Army Staff—majors, especially—this was on the 15th of January, and the late Prime Minister and some other people were kidnapped. The Premier of the Northern Region was assassinated; that of the West was assassinated, and the Prime Minister was kidnapped, although we discovered later
that he, too, died. (Note: The late Prime Minister was Alhaji Abubakar Tafawa Balewa; the late Premier of the Northern Region was Alhaji Ahmadu Bello, Sardauna of Sokoto; the late Premier of the Western Region was Chief Samuel Akintola).

So, the rump of our Senate and House of Representatives met on January 16 and of their own volition, handed over the administration of the country to the military until such a time as enough stability would be restored, and the way would be paved for political parties to ply their trades and to make those promises which nobody expects them to fulfill, anyway. So, since the Military Administration, there have been movements in the direction of trying to stress the unity of the country in a more pragmatic manner. Well, instead of the former four Regions—the fourth Region being the Midwest State, after a plebiscite in July of 1963—the former four Regions were abolished by a pronouncement of the Major-General Johnson Aguiyi-Ironsi, who is Supreme Commander of Armed Forces and Head of the Military Government. The Regions have been abolished, in effect as of May 24, this year, and study groups have been set up to look into the Constitution of the country, to look into education, to look into the question of unifying public services, and the rest of it.

Education has two study groups, actually three. One is about the universities. On independence, there was just one university, the University of Ibadan, but since then, we have had four more, the University of Nigeria at Nsukka, which is in the eastern part of the country, Ahmadu Bello University at Zaria, with a branch of Islamic Studies at Kano—these are in the northern section of the country—the University of Ife at Ibadan, which is moving to Ife, the spiritual capital of the Yoruba-speaking peoples—according to Yoruba mythology, the beginning of the world—that is going to take place this fall, and we also have the University of Lagos. We find that, in these universities, instead of the courses to be complementary, most times there was duplication. This was all part of the result of the political set-up we had when the Regions regarded themselves as rivals. So, our commission is going to look into universities and see that there is no further duplication.

The second point is education itself, how education could be an instrument of national unity; a study group is looking into that. The third one is a study group looking into vocational and technical education; it is that type of education which will give us that middle class of technicians and managers that we need to have the economy.

Free primary education was introduced in what was then known as the Western Region in 1955. This was compulsory and free, and this led to a great number of young men and women coming out of school. In 1955, the country had gone a long way, at least in sophistication and in the type of jobs offered and in the type of training which would equip people for such jobs. So, to absorb these people, some category of
school known as the modern school was started. The modern school could not satisfy too many of them. In 1960, not only in Western Nigeria, but as well in the East, we had these farm settlements, (which) were supposed to attract people back to the land. They got loans from government; they got machinery. They were settled in small, ideal village communities and were given one or two of the amenities, like a cinema house, or a small theater, which is the magnet to draw people to big cities, to settle there. But the farm settlements haven't lasted up to ten years; they don't see what they can do, yet. Well, what they can do all right, but they don't know yet how many people in the country these settlements can absorb. This is what we have tried to find out. So that is for the primary school leaver.

Well, the secondary school leaver had a good chance to get a job and rise by promotion to a fairly good position later on in life. But that was when going to secondary school was a big thing. Now it's no such thing. At the roughest estimate, in the country—which is 55 million—we have about four to five million children in primary schools, and looking at our resources, we don't expect to have secondary schools to absorb all of them. We have a good percentage of them— you know, about one in ten gets to a secondary school later on, and about one in eighteen to one in twenty gets to a university later on. So you find that we reached the stage where a secondary school education wasn't enough to get you a job, and for this group of people, if they were technically minded, there have been advanced technical schools and vocational schools, trade schools to absorb them.

This tradition of trying to get a white collar job is still one of our problems. We still have a good deal of them, all very smart, good university material, but they couldn't get into places. The tendency now is for us to interest them in other things, things other than white collar jobs. And we are even, because of considerable inexperience in planning, having some difficulty with our university graduates. Now we have five universities whose total population has never exceeded ten thousand. Outside the population of these five universities, we have 21,000 in Britain alone, studying to pick up some sort of profession or go in the straight humanities, or in straight science courses, and we have about two or three thousand of them in the United States; we have them everywhere in the world. So, because of some deficiency in our planning, because of the attraction of the humanities, we find that we are about getting to the stage where, although we have vacancies crying out for people in the sciences and other things, most of the people we have are arts graduates and that type of thing. So, we have reached the stage where we want to employ arts graduates for social welfare work and many other things that they do, some of them for recreation, some of them for entertainment if they took the relevant courses. But we find that that's the
big talk: do we produce more people than we need at the time being, whereas the point is that we need many more? So the point is for us to have a shift of emphasis, which is what they are really trying to do. An example I could give you is a statement by one of our Military Governors. This year, about sixty per cent of all scholarships are going to medicine and sciences, and related fields, and the arts gets a little. So this policy is also reflected in the policy of admission of the University of Lagos; it's about the same 60% as before; sciences and related fields--trying to play down the arts.

The deficiency (in the educational system) is education as a whole, as I've said before--the question of formulating a policy of education that is going to meet the manpower needs of the country—that's very, very strong, indeed. There has been some deficiency in science education, but this would not surprise anyone who remembers that Nigeria is essentially an agricultural country. With the shift in emphasis from agriculture to industry, we hope to get many more people interested in (engineering and mechanics). With many more industries in the country, many more people will have job openings, and they'll be just as attractive as regular non-technical jobs, and that's where lies our hope.

Mentioning teacher training programs among the schools, I also want to mention that the U.S.A.I.D. runs a very beautiful school—a comprehensive school—in Port Harcourt, where young boys are at secondary level, together with their academic subjects, learn all sorts of trades. And we've had assistance from American foundations for all sorts of research projects. It's actually a yearly thing. We have assistance from Britain, from all over the world, in the form of scholarships—sometimes outright grants. UNESCO is helping with University of Lagos staffing. UNESCO is also helping with the advanced teachers training colleges. Coming to teachers training colleges—you have some variety of teachers training colleges for people who have their School Certificate plus some teacher training, and we have the advanced for people who are heading for the advanced standards. Our economy has not reached the stage yet whereby anyone who is a teacher should be someone with a master's degree. So, we've got some help from all over the world and we are really fortunate in that we raised some money ourselves to do most of these things.

The science program could be very much helped if we had a redefined philosophy about education, and we really appreciated the position science and technology could play in the development within the country. But as you jolly well know, this is a subject that needs a lot of money, also. The important thing, as I see it, is that we have to fashion an educational system for our own needs. Other countries' experiences we could draw from, but our own needs we have to identify.
As to the question of science, the most important thing about all science teaching—and about all curricula in the country—is for us to have Nigerian authors to write these books—science books—for all levels. Not only science books—all books.

6. Omar Sendze was born in Kumba, in the (then) British Cameroons, whose educational system and government was administered from Nigeria. There he attended kindergarten at the age of four years, followed by two years in the vernacular school, which was conducted in Lampa, the local dialect. At the age of seven, he entered the infants' school conducted by Catholic missionaries, and two years later, elementary school. Upon completion of six years of elementary education, at the age of fifteen he passed the entrance examination, and won a scholarship for the secondary school in Sasse. (Note: This would be St. Joseph's College, a Catholic Mission school which, as late as 1962, had a total enrollment of only 303.)¹

After five years of secondary school, he joined a development corporation as a technical assistant in training. After one year, he sat for and passed the entrance examination for the Nigerian College of Technology. At the end of two years, he received the General Certificate of Education, whereupon he entered London University for three years of study which culminated in the bachelor's degree in engineering. Following employment in both England and the Cameroons, he entered the Ohio State University under the sponsorship of the International Road Federation to do a year's advanced work in the study of highways.

At the time of the interview, Mr. Sendze had completed

requirements for the master's degree and was preparing to return to his home land. The interview took place in the apartment of Mr. Sendze in Columbus, Ohio on August 23, 1964.

There has been a tremendous amount of change. The content of the courses, although basically the same, has changed quite a lot over the years. It's more advanced—brought up to date—so that the boys can be able to go to universities. When we went to school, none of us knew about the universities, then, so the aim of education was not to prepare you to go on to the university; it was to prepare you to fit as a good worker. As time went on, universities were opened in Nigeria and neighboring countries, and these automatically affected the content of the materials in the schools.

The vernacular school was run by the local administration and was free, but not compulsory. (There, we learned) mostly arithmetic and the (local) language. 

(The infants' school) was run by Catholic missionaries. In those days, we are paying ten pennies annual fees tuition. For that, we got free exercise books, pencils, and so on. We actually got it free.

(For the primary school) you paid quite high fees. In the first year, people are paying a dollar a term, three dollars a year (for) three terms. It was a bit high for the economic level of most people at that time, so (if somebody went, it was because) he really wanted to go.

When you finish the primary school, you've got to take an entrance examination into the secondary school. You are selected and admitted. The cost goes far high, far out of the reach of the ordinary people. Only, I would say, the relatively prosperous ones could afford to send their children to secondary schools. There were scholarships. The local administration offered scholarships; the federal government offered scholarships; the college also offered scholarships, and some of the mission bodies offered scholarships. So that, if a boy occupied one of the first ten positions, he was certain to get one of these scholarships. Or, if he was the only boy from his area, the local administration would most likely give him a scholarship. The year I went, there were only three boys from my area, and we all three got scholarships, you see. So, it was a good help.

The vernacular school was set up by the local administrations, because they felt that the boys ought to have more education in their own language before they go on to English school, otherwise, while they are learning English, there is a tendency to become deficient in their own native tongues. So these schools were set up, but you didn't have to go to them before coming to infants'. So essentially what was done in infants' was a repetition of much the same as we did in the vernacular schools, excepting that now we are learning
in English--basic English vocabulary, and we are learning to write.

(In elementary school), it expands a little bit as to what you do in English, in arithmetic, and then you start the study of elementary science. They didn't call it science; the subject in the curriculum was called nature study. At this stage you start learning about plants. The most popular one was the bean plant. You studied about the bean plant every year you were in school.

In the second year, you start learning about the seasons. Of course, you start agriculture from the first years, but we didn't learn too much about it. But by standard four, you begin to study agriculture as a subject. Part of our education was that we had to work on the school farm. We had to learn how to build a ridge, how to plant potatoes, all the normal food crops that we have around that place. After we learn to plant them properly, the idea was that you could help to correct your parents in their methods of agriculture. So, your science education was still at the practical level.

In the final year in primary school, you did biology, and basic hygiene--sanitation and so on.

In the first year of the secondary school, you study general science. The science education you had was essentially establishing the basic principles you are going to use throughout your secondary school career. The second year, you begin to learn more advanced principles. You start calculations in physics; you start to do minor dissections of the frog; you begin to dissect plants, flowers. In the third year, you do more advanced physics, chemistry, and biology. (In the fourth and fifth years, you review for the school certificate examinations).

Science education today is very much improved, because they have much better lab facilities. I mean, when we went to school, we didn't have so much apparatus, so they couldn't allow everybody to do the experiments themselves; they had to do it in bigger groups. Secondly, some of the experiments you couldn't do because the apparatus was not available. You had to learn them from books.

To be a teacher in the vernacular school, you must have passed standard four of the English school (that is, fourth grade of the elementary school, at the age of thirteen). In other words, you had a fair idea of what is taught in the English schools, and also, you must have passed a proficiency test in your own language. (He did not get any training in teaching as such). He was considered qualified as long as he could graduate and demonstrate his knowledge of the local language.

The infants' school had the same requirements as the elementary school. Because of a shortage of teachers in those days, if a boy passed standard six, he could be appointed as what is called a pupil-teacher. In other words, he wasn't considered a qualified teacher, but because of the shortage of
teachers, he could learn to be a teacher on the job. That was the sort of teachers we got. But for the infants' schools, you had to get trained teachers. These trained teachers would have spent at least two years in a training college after standard six. They got what they call an elementary teacher's certificate, grade three. It was considered that infants' was a more complicated stage and the children needed more experienced handling, so that infants' (and standards four, five, and six) had to be taught by trained teachers. Standards five and six had to be taught by teachers who had to get a higher elementary teacher's certificate, grade two. But otherwise, between standard one and standard three, you got pupil-teachers for the most part.

In the secondary school, the minimum qualification was secondary school graduates, but usually, they also had to have two years of teachers' training, except those who were university graduates. But if you were a secondary school graduate with two years teachers' training, you could only teach as far as the third year. The final years were easily handled by degree holders. I went to a missionary (secondary) school, where the ratio of expatriate to native teachers was 50-50. Most of the graduate teachers were expatriate missionaries; some were English, some were Dutch; some were French. The ordinary teachers were Cameroonians—those from secondary schools, with some teachers' training. But by the time I finished, there were already some Cameroonians who were degree holders who came to teach, too.

(In the elementary schools) there were no expatriate teachers except, perhaps, missionaries who came to teach a religious course, if it was a missionary school.

To me—and I've always said it back home—the most important problem in science—and in any education—is the fact that most of what the boys learn in school is not available in practical life. In other words, boys have to commit to memory what to most boys here (in the United States) are every-day appliances. At present, for the most part, these boys have to try to learn to figure things perhaps that they have never seen before. This in itself is the greatest deficiency in the science education that these boys get. And this always shows up when they go up to the university. I think that the syllabuses should be built around more of what is available. There should be more attempts at models in the schools.

The schools need a lot more equipment than they have. The elementary schools have absolutely no equipment whatsoever, and the secondary schools, except in the physics and chemistry laboratories, have very little equipment. It's a question of basic, traditional policy. It's got to come right from the education department—to lay down exactly what they think is the basic necessity of equipment for each school.

The teachers themselves are not adequately prepared for the teaching of science because they themselves have the same
difficulty as the students have: that they are teaching about something that they know very little about. The teacher training institutions must be made a bit more advanced and must be made more practical than they are at present.

It is quite true (that university graduates who teach in the secondary schools know the subject matter very well, but they know very little about communicating it to the students). You sometimes come across that, especially in the junior classes. It isn't wise to have university graduates teaching, because they bring the same methods they use in the university to teach, and these are not suitable for use in the secondary school. The ordinary secondary school graduate, with a few years of teachers' training, is a much better teacher for the primary years in the secondary school than a university graduate.

I should say that (any aid that we receive for educational purposes) should be concentrated first of all on equipping the schools, and second, on giving the opportunity to these elementary teachers to go and have a higher foundation in their science education. I think equipment and further training of these teachers is a must if we are to improve.

7. Sadrack Eric Njomou was born in Penja, a village near the seaport of Douala, in the (then) French Cameroons. Neither of his parents had formal schooling, but his father speaks and reads some German which he acquired during the period when the Cameroons was a German colony, and his mother reads some French which she picked up from her children. His brother completed his university education in Paris, with the assistance of a locally-awarded scholarship. One sister was a high school graduate and his other sister was attending high school at the time of the interview.

Mr. Njomou came to the Ohio State University to study pomology under the sponsorship of ASPAU, after spending some time at the University of Michigan to acquire some degree of understanding of and fluency in English. At the time of the interview, he had completed his junior year toward the baccalaureate. The interview took place in the office of the author at the Ohio State University on June 12, 1964.
I would definitely say that, judging from (my) own family and from the families that (I knew) around (me) that the younger generation of people is getting more education than their parents.

In elementary school, we used to have a little bit of biology—mainly the knowledge of some plants, microbiology, and the human system. In high school, it's much more serious—things like human system, the science of functions and excretions and muscles and the elements that oppose the muscles. We also had physics and chemistry.

I would not say that (the high school science) was adequate, because we lacked most of the facilities. We lacked laboratory facilities. But we had quite a bit of information about science at the level of memorization. We had books, We studied from the notes we took in class and from the chapters assigned in the book. The books were sort of adequate. We had to depend upon the books assigned to us. We couldn't go anywhere else to find a book for reference. In the school where I was, there was a library that was a rather closed library, where you had to have something rather special to enter and get. There was not a system of library like here (in the United States), where anyone could enter. It was rather a closed library.

Many (of the textbooks) were published in France, and some translated from German. They were books used in the lycées of France. You might say that the educational system was patterned, to a great extent, after that of France. The French spirit is not really to have colonies, but to expand the French culture, and so the Cameroon educational system had to follow the French educational system.

In the last year of high school, you have to make a choice between different branches. You take philosophy and humanities, or you may take science, where you get a lot of physics, biology, and chemistry, or you have math, where you study algebra, trigonometry, and even a little calculus.

I chose sciences. We had biology, botany, some microbiology, chemistry. Physics was mostly emphasized in the math. I had a lot of trouble, the first time I had to work consistently in a lab (at the Ohio State University). Before I came over, we never had a chance to work in a lab. We never had an adequate lab. I think that I missed a lot back home. Because in a lab I found a thrill from reading about something and then experimenting and knowing what I am doing. Whereas, back home I had to learn and study real hard and get it in my mind. I question sometime if a certain reaction they give us is true or imaginary, so, in a lab I can experiment sometime and get a result. So, I think that the laboratory work will help me a lot to understand my work in some of these courses. Yes, in Cameroon, they need more laboratories and equipment.

I don't think there is any comparison (between science in the United States and science in Cameroon). We are lagging
far behind in the progress of science. A Cameroonian student has at least the reputation of having a very good memory, because they have been trained that way to memorize things and not care what they look like. I think we need some expansions in terms of laboratories and things like that—how to help the student to realize and put into practice what he is talking about.

Teachers are mainly people who work for their bread, who want to earn money, and for so doing they depend upon their dignity and their individualism. They don't associate with the students so much to give them a chance to discuss certain of their problems. So that, the teacher is very far apart from their students, which over here is very rare, because the student is very close to the teacher and the teacher is very close to the students. These were (the French teachers) at the university and high school levels. They were very well prepared for (the job they were doing). The main thing is that they should have methods and psychology to prepare them for teaching—to learn that it is not always what they say that goes to the student, but that there are sometimes difficulties in understanding and grasping the subject. So they should have learned this earlier and know that they could assist outside classes some of the students who have difficulties, and then their teaching would be effective. (The teachers who taught me in science) were well prepared; as far as practice, they were not. I could not tell whether they were well prepared for laboratory work because there was no laboratory equipment to show this, and maybe they were well prepared for laboratory work or not, but I couldn't tell. They themselves use to complain about the lack of certain facilities. They could not become teachers of a high school unless they have previously studied in a French university in France. I am 100% sure that they have more facilities than here in Cameroon, anyway. There are some of them I have known who have written letters to the government for supply of this equipment, but never got a reply.

We need a lot of things to be improved in our educational system as far as science is concerned. We need laboratory equipment. We need teachers who are cooperative, not just come to class and give lessons. (Much of the teaching that is done is merely lecturing), just lecturing and exams. A few teachers give quizzes, but there are big exams before the ends of the courses.

Books, technicians, and laboratory equipment (would be most beneficial to the educational system), and modern buildings in which this equipment could be put. It would be very beneficial in science (to have teachers who have had more professional training).

8. Nicholas Amouzou Adankpoh was born in Lome, the capital of Togo. He attended elementary school in Togo, but attended secondary
school and higher school in mission schools in Ghana. He was awarded scholarships to do honors studies at Ghana University, and to study at a West German university, but chose instead to accept a scholarship from the Togo government, under the sponsorship of the Institute for International Education, to study mechanical engineering in the United States.

His parents were living in Leopoldville, in the Congo, where his father was a business man, and his mother a retail seller. His father was a high school graduate and his mother a grade school graduate. Of his four brothers, one was studying medicine in France, one was studying mechanical engineering in West Germany, the other two were in secondary school and elementary school, respectively, at home. Of his two sisters, the elder was married and had completed elementary school; the younger was attending elementary school.

At the time of the interview, Mr. Adankpoh was pursuing his undergraduate studies at the Ohio State University. The interview took place at the author's home in Columbus, Ohio on July 17, 1964.

While the French were in Togo, they made elementary education compulsory. (Note: Another source states that "education at the primary level is not compulsory, but it is free.")$^2$ So everybody just has to go. So, in the interior, you have a lot of kids that go to grade school. They get through, but they don't have the opportunity to go to secondary school, since there are not that many in the country, and only a handful go.

They go for six years. (The language of instruction is) entirely French. (For many of the children who don't speak French at home, they have to learn it in school). Actually, we don't see this as a good thing, because most people have a tendency to forget their native tongue. They speak French all their lives, which is not good. Our native tongue is

---


$^3$Ibid., p. 888.
introduced in the schools right from the beginning; they learn it side by side with the French. In Togo, there are forty-four different languages. (Note: This seems remarkable, when one considers that Togo has an area of 21,853 square miles and a population of 1,620,000). It's a problem, but it seems that we really have a way out, in that in the south, the language predominantly spoken is Ewe. A lot of people, even in the north, try very hard to speak this language.

We don't get a great deal of (science in the elementary school). Actually, they tend to lay more emphasis on the French language, right from the beginning. Actually, when you finish grade school in Togo, you can take any position in the government, with this knowledge of French. I would not say it gives him a prestige above the ordinary person; the only thing it does is give him the opportunity to get a job.

While the French were there, they considered that part of Africa which they ruled as part and parcel of France, so they were trying to make more Frenchmen out of Africans. Yes, it's true (that the French were more interested in spreading French culture than in anything else). The programs and everything else (in the elementary schools with which I have had experience are patterned after the French elementary schools). They (have) mostly native teachers. Some are trained in our own country; some go to France for training, or some go to Dakar, the French university for training. You go to l'école normal, where you learn a little bit of psychology, you take some elementary teaching methods, and then some pedagogy. Actually, you study other subjects at a secondary school level.

(Before they enter l'école normal, they have an elementary education). They stay in l'école normal four years—but now they have changed it to five years. You take four years of regular high school education, and then you take one year of practice; the pédagogie is now extended for one year.

There are separate secondary schools which are run by the government. But now there are some private people who have set up some secondary schools. Attendance is for four years, but if you want to go to a university, you have to do three extra years after secondary. Actually, (this extra three years) is the school secondaire, but you either go to the mathématique, where the emphasis is on mathematics, physics, and chemistry, or you go to the school classique, where the emphasis is on classical languages, geography, history.

I went to high school in Ghana, so I can give you (an idea of the educational program there). They have ten years of elementary school, starting at age five and they take six years, or four years (of high school), depending upon whether they want to go to the university.

Science in Ghana has been given more emphasis than in some of the French-speaking countries in Africa, more than in Togo. Actually, the school that I attended—their program is parallel to that of Achimota secondary school, which is one of the top schools in Ghana. In the first secondary
school year, we take physics, chemistry, botany, and zoology, which at this level is merely demonstrative—teacher demonstrations. In the second year, we take a second year of the same sciences, then a third year and a fourth year. Then you take your Cambridge School Certificate.

In the secondary schools (of Togo, we) have Frenchmen teaching and native teachers, too. In order to teach in the secondary school, they have to go to college. I didn't go to college, but I taught in the secondary school for a year and a half. I managed that by doing sixth form, which means I had six years of high school, instead of four. And I did extensive studies in mathematics, so I can teach mathematics to any secondary student. I taught in Ghana.

Secondary school teachers must be college graduates and have their diploma in education. We often refer to the secondary teachers as professeurs. For their college education, the secondary school teachers of Togo go to France. Some go to Dakar. There is no college in Togo; it is too small to have one. (It is a question of money).

(The elementary school system in Togo is also patterned after the French system), at the present moment. There's little change. The only change is in the teaching of the Ewe language. They take it in the secondary schools, too.

(The teaching of Science is) the same thing in Togo (as in Ghana, with lectures and teacher demonstrations), because, as a rule, some secondary schools cannot afford to buy expensive equipment for high school students to play around with. (There is some student experimentation) in St. Augustine's and Achimota (in Ghana). In Togo it is the same. In St. Joseph, there are some students who perform their own experiments. In the city you have some experimentation programs. Then, in the high school baccalaureate level, there are students who do more of their own experimentation. Actually, there is more teacher demonstration in the first year than in the second year, and so on.

I think there might be a better way. I think that if the students are allowed to perform their own experiments, they get more than the textbook material. They try to put into practice what they have learned from the textbook, instead of memorizing everything. I think that the people who are concerned with these things, like the Ministry of Education, would like to put into effect more student experimentation, but at the present moment, I don't know what they are doing about it. I know that some of our ministers came to this country to tour some of the high schools. They have come back, but I don't know what changes they have thought about.

Most of the materials (used in the laboratories) are imported; (they are) just like the ones you have here, only there are not many. In the sixth form (in Ghana) almost every student in chemistry, physics, zoology, or botany has his own equipment. We have the same thing in mathéleme in
Togo. There is more experimentation at those levels, because most of the exams that they are required to pass in Togo are written or oral, and then they do practicals. Practicals involve the use of equipment.

The attitude of the past government (in Togo) is a pretty good one. They are trying to get education across to everyone in the country. They have started to build a very large secondary school (in the capital, Lome), on a very high level for the country. They are prepared to put out a lot of money for education.

We could use some assistance in building more secondary schools, providing more science teachers, construction of science laboratories.

The science level in the elementary school is basically the same as in other countries (of Africa). It's not that extensive. They could use textbooks in science. The textbooks they have are imported from France, and they are not up to date.

I think that the textbooks on the secondary level are not good enough. They're not accurate, too. Science is progressing so fast it is very difficult to keep up with it.

What I can say (needs improvement) is the system of examinations. Even at the brevet level, the final exam of the secondary school, in algebra, for instance, they give you just two problems. At the baccalaureate level you have the same problem: two problems.

9. Edouard-Raphael Placca was born in Porto Seguro, on the coast of Togo. Starting at the age of five, he attended elementary school in Porto Seguro for three years, then continued in Lome for two years, and completed his last two years in Porto Seguro. Because he was too young to enter secondary school, he studied for one year at the Ecole Supérieure in Lome. He then attended secondary and technical schools.

After graduation, he taught mathematics for one year at the first year level of secondary school, and at the same time, did some French-English translation for a foreign embassy.

His father, who was a teacher, and had studied during the German colonial period, influenced him to study German with the hope that he would seek further education in Germany. Mr. Placca did indeed secure a scholarship for higher studies in Germany, but then was influenced by
some American friends to try for a scholarship to an American university.

At the time of the interview, Mr. Placca was an undergraduate student at the Ohio State University. The interview took place in the author's office at the Ohio State University on October 25, 1964.

(The classes in the elementary school at the time I attended) were conducted only in French. The kindergarten prepares you to come to school. They learn a little bit of French, but at a very slow pace (so that, when you enter your first year of elementary school), you would be able to read, and to know the sounds. It was always in French. The teacher may give an explanation of certain things (in the local language) when he wants to make a comparison, but most of the time, everything was in French.

Now, they learn the native language—Ewe. The Germans wrote down our language.

(The educational system of Togo) is the same thing as the French system. The exams are corrected in France.

I went to secondary and technical school. It's different from grammatical [sic] school. There we have greater chances. We have workshops, too. And then, we have technical drawing, and things like projective geometry. It takes a year longer than regular secondary school, in that you have to do some workshop, particularly using a lathe, and turning, and things like that. Of course, we don't have much choice. We have wood work and metal work, and you might want to take just one only; you have to take both for a year or two years. Most of the (people who graduate from this school) become technicians. Some of them develop their interests in scientific work, or go to engineering school. One problem is that we don't have money, so that in the end, the interests get chilled off, because there are no ways to expand. It's one of our biggest problems.

The government can give these boys scholarships to go to France. The best get the scholarships. If they don't get that, then they have to work. If they don't get work that has relation to what they have done, then their potential is going down. This is one of the problems we have.

In our elementary schools we have lecons des choses,--nature study. It comprises almost everything, but on a small scale, like (the composition of the air, study of the planets, study of plants, etc.). We do not have formal science in grade school; in secondary school we do have it. We have four years of physics, chemistry, biology, and mathematics in the first four years of secondary school. We go to school from eight to eleven-thirty and from two-thirty to five. During this time, we have each science twice a week.

There is not a very well-equipped laboratory and, for the most part, the instructor makes the demonstration. It is the
class at the same time. He gives the demonstration, or shows us the different types, or how it works. Excepting physics and chemistry, you will be watching experiments performed.

In quatrième—third year of high school—you learn to do some of the elementary experiments. In troisième—fourth year—you will be doing some in physics and chemistry. (In the fifth and sixth years), if you go to sciences experimentales, which leads to whether you want to become a medical doctor, then you do more chemistry. If you want to become mathématique, there you have more math and principles of math. That is more in class. But the sciences will not tolerate this; you do more lab.

We didn't do much (in the way of experiments on our own) because some of the equipment the government couldn't afford. That's a handicap. In France they have more opportunity to do experimental work. But now, the French have equipped the university at Dakar for French-speaking Africans.

(Here Mr. Placca describes the preparation of teachers in Togo. The system is typical of those followed in other former French colonies and mandates, and is described elsewhere in this paper.)

I wouldn't say (that the science teaching in the elementary school was adequate for that level). There were things that could have helped, like the manner of presentation (of the science topics). Maybe now, people may be having more facilities in the high school than we did. It could be (that the teachers themselves were not well-prepared in science). Most of them came from the école normale, which may not have had all the facilities, except the theory from the book. These were French textbooks. But the trend may be changing. Today, they're doing in high school what we didn't do.

In high school, they have a preparatory year; it is septième. (This is before sixième, the first year of high school). Some people may fail their (final) examination in grade school, but they pass for secondary, so they go into septième. This gives them more practice and more preparation for sixième. This is because of the final external examination. This is given the same day as it is given in France.

I would say that (science in high school) is adequate, but it is more theoretical. The one that has a creative mind is handicapped. I would say that seeing it yourself would be great. Now we send people, after they have had their brevet—i.e., passed their examinations after the fourth year of high school—to France, and if they are going to teach, they learn up-to-date for about eighteen months, then they come home. So that now, we have chances for better teachers than before, in my time.

10. Mahmoud Salih Hassan was born in Wadi Halfa, on the northern border of Sudan. There, the local language is Nubian, which is spoken
in the home and by all children until they enter elementary school, where they learn Arabic. His parents, both of whom are deceased, were farmers who had no formal schooling. Of his five brothers, one had no formal education beyond the khalwa, the second had an elementary school education, the third attended the Sudan Railways Training School after his elementary education, the fourth attended elementary school, and the fifth attended elementary and intermediate schools, and completed his studies at a technical institute.

Mr. Hassan, after completing his elementary and intermediate studies, passed the examination for entrance into the secondary school located in Wadi Siddna, in Omdurman. Upon passing the Sudan School Certificate Examination, he entered the University of Khartoum, where he acquired his baccalaureate from the College of Agriculture after five years of study. Upon graduation, he joined the Department of Agriculture, which awarded him a scholarship to study vegetable horticulture in the United States.

At the time of the interview, Mr. Hassan was engaged in graduate studies in horticulture leading toward the master's degree at the Ohio State University, with the intention of continuing studies at that institution toward the doctorate. The interview took place in the author's office at the Ohio State University on August 21, 1964.

(In Sudan), Arabic is the official language of the government, of education, religion—everything. English is the main other language. None of the native languages are used. You start learning English in the first year in the intermediate school, and during the whole four years of intermediate education, you do not use English as a language for teaching any subject. But starting from the first year of secondary school, you start learning all sciences and mathematics in English. Then, in the second year, you start learning geography in English, until—I think—in the final
year, you are learning everything in English except, of course, Arabic and religion.

(The Sudanese system of education consists of) three levels, four years of each—that makes twelve years. (But the plan is) to change it to another system which is six years, six years. Instead of four years elementary, four intermediate and four secondary, they are going to divide six into elementary and intermediate, and six into higher intermediate and high school.

I think that they have found that there are many dropouts from every one of these levels, from the elementary school and from the intermediate, and they cannot make use of these fallouts [sic] because they have nothing in their training. They hope to train them so that they can be useful and fit into the society after they graduate.

(In the old days,) there were what we call khalwas—some learned men teach the religion and simple writing (in Arabic), and it is still continuing in some parts. That is, before you enter elementary school, usually most of the people send their children to these schools. No, they are not called schools; they are called khalwas, pre-elementary schools. They go there and learn how to say their prayers and the first articles of the Koran, and how to write ABC—I mean in Arabic. I think (education) was mainly restricted to the boys, but in our times, I used to see both sexes going there, in these khalwas.

During our times, when my older brother was taking his education, there was only one elementary school in the whole area, and there was only one elementary school in Wadi Halfa, and Wadi Halfa extends for about 115 kilometers—about 70 miles—along the Nile, a maximum of one mile or one and a half miles away from the Nile. It boils down to taking about forty students in the first year of the elementary school, and since the competition was very rigid, only the luckiest could enter these schools. But in my time, there were not only elementary schools, but intermediate schools were there, too.

All of our high school were and are run by the government. Some elementary schools are run by missionaries. During our time (the elementary schools) were run by the local people. The government tells the local people, "Make your school, build it, and we will supply you with textbooks and the teacher". But I think about five years ago the government took over all the schools. The system (whereby) local people build the schools is called ahlia.

During our time, at the elementary school, I cannot call anything science. But now they have science, just very simple ideas about "What is a gas?", "What is a plant?". Language was very important—Arabic, religion, arithmetic, geography of Sudan, history of the Sudan, crafts.

In the intermediate school, in addition to the courses I have mentioned, we had English, starting from the first year; and mathematics, of course, was well-developed into different
branches. One of the things was that, in the first year, we had a bit of science, because we used to make some experiments and write our observations and also, there was some teacher who was teaching us science. But that was only for about two terms. But after that there was no more science teaching in the intermediate school. But now I think there are well-prepared labs in the intermediate schools. I can't tell you what they teach them there, but there are new labs and science teachers.

The teacher used to make the experiments. Of course, everything was limited. The practical which every student has to do was not as much as doing it by yourself, just observation and writing what has happened before you.

In the secondary school, science was, of course, very elaborate. There are appropriate labs for physics, chemistry, botany, and there were very fine teachers there. They were British and Sudanese, and they were really very well qualified as teachers. We usually had two or three lectures a week and two two-hour labs.

During the first year, it was not so elaborate. We started with biology, that is, botany and zoology, and also physics and chemistry—the fundamentals. It was a continuous course from the first year until the final year—just building on, or making it more comprehensive, or adding new things. The lab work was really something for which you were counted; you had to do it.

(It requires five years to take the degree at the University of Khartoum), because the first year is called "Preliminary year." You just recollect or recall whatever you are going to have. It is divided into different colleges. In the sciences it is called the School of Science. You study chemistry, physics, zoology and botany. From there you are selected. Some of the best are selected to the College of Medicine. The next go to the Veterinary Science. The remaining go to the intermediate year. It is a very tough year, and you study zoology, chemistry, and botany—no physics. After that, if you want to, you go to the College of Agriculture. The remaining study pure science for four years, or five years if you are going to have an honors course.

The general science I had in the high school was extremely comprehensive and covered all fields of science. The knowledge they gave us in those years was tremendous. (The science work was both quantitative and qualitative). In the year high school, there are two additional courses offered. One is called additional mathematics, and the other is additional science. Those courses are offered for the students who are outstanding in their science work and in their mathematics.

In the science period, there were special adjoining lab and lecture rooms. They were long rooms. At the fore-ends, you find stages and chairs. Besides the blackboards, you find all sorts of experimental equipment—apparatus. The
teacher would show us everything on what he is talking about. We used to take notes while he is talking, and our observations. And if you are going to do any experiment, the student lab is just behind where they are sitting. So he demonstrates whatever experiments you are going to do, and what is the idea about it, and what results you should expect to find. Then we used to go back, and everybody works on his experiment. And of course, the teacher was always there to answer questions, and to help if there is something wrong.

It was very well equipped. The textbooks were not at all available. In the sciences, we have for each course, each subject, a standard textbook which the school gives to you. Everything is in English. (The school gives them to you for) just one year, then collects them back. There were additional references in the library of the department, and you could go and take them. But the system was so built that you were expected to take all the information from the teacher, not from any textbook. I mean, the teacher comes and lectures in the lecture periods. You really cover everything. There was really no initiative to go and read something on the outside, because everything was there. If you took every word from him, you could have gone and (passed the course), if you can really memorize it. (These books were mostly British books, published in London). They were very standard books. Some smaller references were published in the United States.

The elementary school teachers are usually graduates of intermediate schools. They are usually next to those who go to the high school. I mean, from all the successful students in the intermediate schools, they take the top for the high schools. Next come those who go to (the training schools). In our time, they were really magnificent teachers. Of course, the schools were few—very few—and the selection was very rigid. Therefore, the teacher was really very reliable and very nice. I am offering them these descriptions because of what I am seeing nowadays in our schools there. Because nowadays the schools are so many, and I think the standard of the teachers has been lowered a bit. The requirements are still very tough and high, but I think their dedication and teaching (may not be as good).

The teachers in the intermediate school are selected from the secondary school, but they must have passed their exams. Usually they send them directly to the elementary schools, without further training. But during their stay, they go after one or two years, to a place they call Bakhter Ruda, a school for preparing both elementary and intermediate (teachers), and now I think it is going to be for high school, also. They stay there for two years and take all their courses—psychology and education, and all this. Some of them pass courses in their specialties, courses in which they are going to teach.

We were the last to have (science in the intermediate school). After we left the first year (of the intermediate
school), it was abandoned. (I don't know whether or how much science they are now teaching in the intermediate school).

(Secondary school teachers) must be graduates from the university, and they also come directly to the high schools. The Sudanese who might graduate from Khartoum or any other university, who go to teaching in high schools--their further training in education was made in England, or any foreign country. But now--it is two years now--they have established a school, like a College of Education, where those people who are going to teach in high schools go directly to that school from high school. Those (schools) are for four years.

Of course, in the high school, we have a few foreign teachers--English, Egyptian, Lebanese, and all sorts of nationalities. They are mostly English, as a matter of fact, and Egyptian. These are mostly people who teach sciences. There is a shortage of Sudanese teachers of sciences and mathematics. That is why they bring the foreigners.

(In terms of the needs of science education in the Sudan), I think that the first thing is science teachers, I should like to have equipment--apparatus--which are very expensive over there. (I should like to see) a very vast base of well educated Sudanese, or Sudanese well trained in many branches of science. Some will be scientists themselves, and some of them who will go out into general life, just to be scientifically minded.

11. Hamid Abdel Magid Gasim was born in Shendi, about 90 miles northeast of Khartoum, in Sudan. He changed schools often, as his father, who was a government official, was transferred to different sections of the country. He attended elementary school in Malakal, in the Upper Nile Province, about 420 miles south of Khartoum, and intermediate school in Wad Medani, in Blue Nile Province, about 100 miles southeast of Khartoum, and secondary school in Khartoum. After sitting for the Cambridge School Certificate, he served a two-year probationary period as teacher of mathematics in an intermediate school, after which he was admitted to the College of Education at Bakht-er-Ruda. He received a diploma after two years of study at Bakht-er-Ruda, which established him as a full-fledged teacher of mathematics at the intermediate level. After three more years of teaching, he was one of twelve intermediate
mathematics teachers who were selected to receive two months' special training at Khartoum Technical Institute (KTI).

These specially trained teachers were then sent to trade schools to teach the various technical subjects, or their own specialties as applied to technical disciplines.

Mr. Gasim, at the time of the interview, was on leave from his teaching position in the Sudan in order that he might complete his studies for the undergraduate degree in education at the Ohio State University. The interview took place in Mr. Gasim's apartment in Columbus, Ohio, on August 24, 1964.

The curriculum in the trade schools was very different from that of the technical schools. We have to teach everything applied to the technical subjects, and we have to teach everything in English.

After the student completes the intermediate school, they sit for competitive examinations. They number more than six thousand. The first three hundred are selected for academic schools. The next on the list will be selected for the trade schools, according to their grades in mathematics, English. They will spend three years in the trade schools; after that, they will be going to the senior high school for specialization in a certain thing—either builders or carpenters, or something like that. They spend two years (in the high school). They will be situated in jobs like foremen, working as government officials. They will have jobs in different ministries, like Ministry of Works, Technical Transports, things like that.

(The people who are going to do the work, like carpenters, electricians) will come from the new schools which have already been built for technical education. After the elementary schools, on the basis of examinations, they will be selected for the technical schools. That means they start their technical education earlier than the (intermediate) boys by four years, and they continue their technical education, and at the end of the fourth year, they sit for the competitive examination. Some of them will join those who came from the intermediate school and go directly to the trade section, and the rest of them will go to the senior high technical school, KTI, and that will open the way for them to go to a higher education in Khartoum Technical School. (This is the highest that is available to them). They will be working toward being engineers, automobile engineers,
electrical engineers. Some of them go into government work, also. They will be treated the same as those who have graduated from Khartoum University.

In the first year in elementary, you have to know the Arabic alphabet and writing words—just copying them and learning some of the religion from the Koran, learning by heart some of the prayers in the Koran, learning some hygiene, some primitive ideas, showing them the malaria insect, and house flies, and all these things. They are seven years old when they enter the first year.

I never heard of science at all up to my junior high. This is one of the great problems in the Sudan. I was in Bakht-er-Ruda in 1957, and they were designing a science curriculum for the intermediate schools.

In junior high—or intermediate school—they start the English language in the first year, at the age of eleven.

(Not everybody that comes out of the elementary school goes into the intermediate school). I worked in Khartoum Intermediate School, which is the only government school in Khartoum. The others are private schools. As you know, people like government schools, because they don't take as much money as the private schools. I was an examination officer, and I had to know the number of students coming to sit for the examinations. The number of students who came to us were about six thousand, and we just selected eighty of them. Only eighty went to Khartoum. Some of the others go into other schools outside of Khartoum.

These six thousand are just from the Khartoum area. Now the Minister of Education does not allow a student from Wad Medani province to come and sit for the examination in Khartoum. Now the Ministry of Education is trying to hand over these elementaries and junior highs to town councils. They will be under the supervision of the town councils.

Then comes the senior high. Here comes the grave problem that faces education in the Sudan for the students who are selected for the secondary schools. They review everything that they have taken before, but in English. In the junior high, everything has been in Arabic, except for English language. In the secondary school, everything is in English but Arabic language and religion. It may be a little bit more advanced, but there is not that much difference. This is one of the problems that has been discussed in Bakht-er-Ruda Institute, in one of the seminars, that there is no use in just wasting four years—five years—four years secondary school and the fourth year intermediate, just reviewing things.

The science is different. You don't get any science in the intermediate, but you get some in the secondary. But if you take, for example, mathematics—everything I have learned in the intermediate, I have taken again. I take some additional mathematics in the fourth year.

In science, the teacher tends to lecture. Science runs
about two lectures a week and maybe three labs and more recita-
tion. The labs are two periods long. They differ from one
school to another. For example, in trade schools, out of the
42 periods a week, the student has to work 21 in the workshop
and the other 21 for technology and mathematics, and 4 peri-
ods for science. That means the teacher must make one week
for labs and the other for lecture. He can design it as he
likes. Sometimes he finds it necessary to make an examina-
tion in a certain week, and drop a lab or something. There
is no fixed way of teaching sciences in trade schools. It is
left up to the teacher to do what he likes about it.

When I go back, I am going to teach again in a trade
school--science applied to technical application. We are
bound to a certain curriculum in technical schools. That
means we have to teach an electrician electricity and we have
to teach builders building science, and we have to be bound
by this. I was about to turn one of my papers to you. It is
is about how to build a curriculum in science for trade schools.
I was taking a vocational education course with Dr. Reese--
(Robert M. Reese, Professor of Education at the Ohio State
University)--and I told him that it was too difficult for me
to design this curriculum, because the students come to this
stage--the technical stage--having no background in sciences.
They came from the intermediate school, and they have to
know something before they can learn anything about electri-
city and buildings, and anything like that. And he agreed
with me. When I designed this curriculum, I said that, in the
first year of trade school, they have to know about general
science, then physics--but first, fundamentals of physics, be-
fore going deep into the science itself.

I think, to a certain extent, I may change a great deal
of this sort of teaching, and specifically, in the method of
teaching. I have told you that I have been teaching accord-
ing to the British system. In the sciences, I have to do all
the work. I have to explain to my students how to do (every-
thing); one of my American advisers in Sudan called it
"spoon-feeding." The students do nothing at all; they just
come to class knowing that I am going to do everything for
them. I got some experience in teaching science in America,
(and I intend to do things differently when I return home).
They will have to do everything alone. The teacher will be
as a guide, helping anybody that needs help. I don't like
this method of spoon-feeding, because it is something which
keeps the students' minds idle. But I really feel that we
are going to meet some problems (when we try to institute
these new methods of teaching sciences).

I think that one of the things that I like, here in
America, is that they are concentrating on the elementary
schools, and they are giving great care. They select very
highly qualified teachers for the elementary schools. But in
my country, they just select the students who have just fini-
shed the junior high. They know nothing about behavior.
These are teen-agers who are going to teach little kids. They are too young themselves; they themselves have their own problems.

I feel that every student needs a background (in science), because I went through this problem before. When I came to teach science in the trade school, I found myself at a loss. I have to go again and review what I have learned in school before, because in the junior high, there are no sciences. After I completed senior high school, I spent about six or seven years teaching everything but sciences. When I was shifted from academic schools to trade schools, I had to teach mathematics and sciences. I went back learning the sciences from the beginning.

Education is about to be compulsory in the elementary schools. It is not yet compulsory; there aren't enough places for the students who come for this first stage of education.

The traditional Arabic schools are not now existing, except in the villages outside of the big towns. I used to go to one of them. We call them "khalwa." They teach the Koran. Most of the students of khalwa learn the Holy Book by heart, and this will strengthen them in Arabic language and Arabic grammar.

Starting from this year, the intermediate schools will be free. The elementary school is free. The government schools are free. The private schools and missionary schools --they have to pay a sum of something like six dollars per month-- about two pounds. They have to buy their clothes and books.

In the government schools, the books are given to the students for a year. The Ministry of Education sends the books to all the schools in Sudan--ship them, sends them by train or by air to the different schools. They find no difficulty in that, because the curriculum is the same in all the schools. They give a certain age for all books; they say, "This book will be used for three years, or two years," and they have to turn it back and get a new one. The cost to the intermediate schools is about twelve pounds a month --that's about $36. That was up to last year; now they will be becoming free.

In the secondary school, some of the students will be accepted free, because their families are poor, or because they are very needy. Some of them will be accepted at half-fees or part-fees. If he is a boarding student, he has to pay thirty pounds; that would run about ninety dollars a year.

I think that the changes that the Sudan needs very much (relate to the fact that) we are now going on the way to American teaching, and as the Americans have now taken over technical education in the Sudan, I can speak from this point: that we may need some experienced Americans in the field of sciences and teacher training centers. (People should come from the United States) and teach in teacher training centers. I think there would be a teacher training center for technical
education in the Sudan, and this would be the same as in Bakht-er-Ruda. This would be number one.

Number two would be to send students abroad from here to America. From high schools. I think it would be better if they select students from Khartoum Technical Institute, especially the higher level of technical education in the Sudan, to be trained in all fields—I mean in sciences, in mathematics, in technical subjects, to go back and teach in the technical schools, because I think it is easier than sending us who have been familiar and active themselves in teaching in academic schools. Although I know that the need for teachers is very critical and the time is critical, and not knowing what to do, they send these teachers over here, although I don't think they are doing good, (and it would be better to send inexperienced students to train them for technical teaching).

12. Ali Mohamed Ali was born in Merowe, in the Northern Province of the Sudan. There, he attended the khalwa for instruction in religion and Arabic. At the age of seven, he began his formal education, attending elementary, intermediate, and secondary schools in Omdurman, in Khartoum Province. He attended the Institute of Education at Bakht-er-Ruda, with additional seminars at Khartoum Technical Institute.

At the time of the interview, Mr. Ali was on leave from his position as physics teacher at Bakht-er-Ruda. Under the auspices of AID, he was completing studies toward the master's degree in science education with major studies in physics and a minor in mathematics. The interview took place in the author's office at the Ohio State University on October 31, 1964.

Actually, the khalwas in the north are very big. The people that attend them may go over 600 students, and (the one I attended) is one of these types. It has got a number of small rooms next to it in which students live. Some students come from different areas because the well-known khalwas are recognized as very important. People come and spend their whole life here. The people who are advanced in their study of the Holy Book become teachers for the junior ones; the last group is taught by the sheikh himself. (The khalwa) is not a kind of kindergarten (only for pre-schoolers), because they are attended even by people who
are as old as twenty years. The khalwas actually constituted the first schools in the country. It is a religious school, during which the whole Holy Book is taught, and when the student is coming out of the khalwa, he will be learning the whole Holy Book by heart.

They were the only schools before the new system of schools was introduced by the British and Egyptians. From these khalwas came the important religious people and groups. (The small khalwas which were primarily for kindergarten purposes) now are being dropped, and what we call sub-elementary schools took their place. It is the sort of school that has got one teacher that teaches all the subjects. The students study there for three years. But this type of education is not sufficient to call him up to intermediate school; nowadays, the government is continually raising up the level of these schools to complete elementary schools. (The sub-grade schools) will not be started again, according to the latest reports I have from our Minister of Education.

I believe there will be a different type of school in the south, that is called the bush school. This is being started under the supervision of American advisers. It is similar to the type of school that has one teacher for all the grades, like rural schools (in the United States). The people in the south are ignorant—sub-primitive. Some of them depend on cattle and some on hunting, so the villages are very small and scattered. So there is a stressing need for this type of education because they want to change the political situation there.

In the north all subjects in the senior high are taught in the English language. In the junior high, they start with the first grade, teaching thirteen credit hours of English language. So it is that our education in secondary and universities is taken in the English language as the medium.

For the first time, the Sudan Examination for entrance to college has become independent this year. Before that, we have Cambridge School Certificate for entering the university or Oxford. Some of the private schools are Italian schools; they take the Oxford, and the government system is taking the Cambridge.

When I went to school, there was no specific course of science. In the elementary level, they had what they call general knowledge. In this general knowledge, they taught some things that have got connection with science, but in relation with public health. But strangely enough, in the intermediate level there was nothing at all. Even this general knowledge is dropped.

In the senior high, they start teaching the entire circle or curriculum for Cambridge School Certificate Examination. Science was taught in a direct way to me. The teacher starts with the principle first—it is on the board; he explains it and makes a demonstration before the students who are sitting in chairs just watching him. On very small occasions, they
give the students a chance to carry out experiments, and usually, he tries to verify the types of experiments he has had before. When I completed my secondary education, I came out quite ignorant of using the microscope, of using even electrical apparatus, but I knew the whole principle. I learned it by heart.

There is no specialization in physics, biology, botany, and all these fields, as is the case in the United States. A student taking science takes the whole lot—an equal number of credit hours in biology, chemistry, and physics. People who are prominent in this general science take what is known as special science, which is a little bit more advanced. It takes in physics, mechanics, and some of these things. But this is what is taught after the secondary level. In the universities, they do the same syllabus for the Oxford and the Cambridge.

Later on, when the country got its independence, Ruda got the idea of introducing science, starting from the elementary schools. And because they have the original syllabus of general knowledge, they started it in the elementary schools. I believe it is up-to-date even after I came to the United States and saw what is taught in elementary schools. But in intermediate, there is still a big gap.

It is still, in secondary school, the same course. But they designed specialized courses in biology, in physics, and so on, besides the general course, to take the place of what we call special science. These courses have introduced the idea of giving the student a chance to do experiments. But it is still direct method; indirect method is not used now. (Attempts to introduce indirect methods of learning have not met with acceptance from the students).

It seems to me that science (in the Sudan) is taught for the sake of knowledge—just knowledge for the sake of knowledge. It hasn't got anything to do with the idea of teaching science for the promotion of critical thinking, or problem solving. Experiment has got no place; it is just lecturing. In this way, it has got no relation to the student's life, except in the sense that they feel engineers, medical officers are the people who have got the great sway in the country. For the sake of earning money, they learn science, memorize it, and succeed in it. It seems to me there may be some people who are scientifically oriented, who have the ability and interest, who would be better scientists if they are taught the other way. So these people—it means nothing to them, and they just drop it. The whole problem now is to change the method. To change the method is to make a survey of the national situation, the needs of the future, the social standing, the things that are handy, and then to study this, design the curriculum, and have the method in mind that they should call the program. When it is done that way, I believe science would be an interesting course. It would draw a big number of the students.
I have been told that, when I go back, I will be in an institute that is annexed to, or assigned to, technical education, and my role there would be to teach some teachers the scientific method. (I hope to start a) science club--science teachers' organization--and we will try to put in a circulation on science teaching, and we will try to distribute this. Perhaps I will ask the government to give me a chance to volunteer in summer seminars to be held in Khartoum.
BIBLIOGRAPHY

Books


Nigeria. Education Department. General Science Syllabus for Middle Schools, Classes I-VI, 1935.


Sudan. Ministry of Education. Province Education Officer's Handbook. (Undated, but probably between 1951 and 1957.)


U.S. Department of State. The United States and Africa. 1964.


**Articles and Periodicals**


"Le Centre de Production de Manuels et d'auxiliaires de l'Enseignement Installé à Yaoundé," Abbia (Cameroon Cultural Review), I (February, 1963), pp. 91-95.


"Education in Nigeria," Foreign Education Digest, XXVI (October-December, 1961), p. 16.

"Educational Activities in Cape Coast, Ghana," Foreign Education Digest, XXVII, No. 2 (October-December, 1962), pp. 120-121.


"Sudanese to Talk of Peace," The Ohio State Lantern, (January 11, 1965).


References


Unpublished Material


The Ohio State University. Personal interview with Jephthah Anozie Abara of Nigeria. October 31, 1964.

________. Personal interview with Nicholas Amouzou Adankpo of Togo. July 17, 1964.


________. Personal interview with Mahmoud Salih Hassan of Sudan. August 21, 1964.

________. Personal interview with Daniel Héralt, visiting instructor in the Department of Mathematics, and teacher of mathematics at Sorbonne University, Paris, France. December 7, 1964.


