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**The Evaluation of Human Capital in Malawi**

Stephen P. Heyneman

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Stephen P. Heyneman

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When this paper was first published Stephen P. Heyneman was a member of the Education Department of the World Bank.

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Abstract

Malawi today has the same portion of its total population in elementary school as it had in 1911. And despite the fact that students attend school longer and are expected to absorb a wider variety of information and skills, the degree of efficiency by which this is accomplished suggests that improvements would be in order. The average 16-year old (8th grade) Malawian student has attained approximately half the level of reading skills attained by the average 10-year old (4th grade) student in North America, Western Europe or Japan. Among other reasons this is so because the schools in Malawi have only one one-hundredth the level of reading materials, equipment and pedagogical supplies which are available to schools in high income areas of the world. This is so also because Malawian students are likely to be learning under a significantly lower status of health and nutrition, with over half reporting bouts with malaria, one in five with bilharzia, one in ten with trachoma and/or hookworm.

Despite a tenfold increase in the number of students since independence, the chance of attending secondary school is still only three out of a hundred. This is typical of education and training in general: it is scarce, and its scarcity helps to determine its profitability as an investment--to the society and the individual. The rate of reported unemployment among males who pass their MCE examinations is .7%; and the economic social rate of return to secondary education at the very least is 14%. In sum, despite recent unprecedented expansion, international investments in Malawi's secondary education appear solid.

Suggestions that educational investment might act to cement social inequalities between one generation and the next should be put aside in the case of Malawi. Students from family backgrounds of relative poverty--on the average--perform equally well on selection examinations as do students from privileged family backgrounds. Moreover earnings are determined not by an individual's family economic position but by his (or her) education and ability. There is, in essence, no reason to suspect that investments in education would adversely affect social equality; and there is very good reason to suspect that new investments in education and training are badly needed.

Precisely what level of investment should be available for specific skill training, educational research, higher education and management should await more focused studies of these areas. But the available evidence would suggest a minimum level of new investment in primary and secondary education of approximately \$3.5 million/year and \$7.9 million/year respectively. Between 1980 and the year 2000 approximately \$228 million (at 1978 prices) should be added to the current amount of investment in these two levels of basic education.

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GLOSSARY

CCAF	-	Church of Central Africa, Presbyterian
IEA	-	International Association for the Evaluation of Educational Achievement
LDCs	-	Lesser Developed Countries; synonym: Lesser Industrialized Societies
OECD	-	Organization for Economic Cooperation and Development
JCE	-	Junior Certificate Examination (taken after the second year of secondary school)
MCE	-	Malawi Certificate Examination (taken after the fourth year of secondary school and roughly parallel to the 'O' level examination in the United Kingdom).
SES	-	Socio-economic status (measured usually by the level of parental education, occupation and family income).
K	-	Kwacha - the basic currency unit in Malawi
r	-	Correlation coefficient - except in para. 47 where r refers to the economic rate of return for investment in secondary education.
b	-	Unstandardized regression coefficient.
beta	-	Standardized regression coefficient.
P	-	The degree of statistical significance.
U	-	Unemployment.



THE EVALUATION OF HUMAN CAPITAL IN MALAWI:

SUMMARY AND CONCLUSIONS

Background

- i. No economically developed nation has attained that status without a near universal ability on the part of its general population to read, write, calculate, among other skills; and no nation has been able to acquire these skills without a universal distribution of education with a minimal standard of quality. The task of economic planning in the field of human capital then, is not just to judge the worthiness of education as an economic investment, for that worthiness is somewhat self-evident. Rather the more complex task of planning human capital investments is to gauge the timing and the nature of its emphasis: how much resources, when, for what returns, and at what level; whether more quality or more quantity; and whether on skills specific to a vocation or whether on skills which are generalizable from one vocation to another.
  
- ii. A fair amount of descriptive evidence already exists on the distribution of education and training in Malawi. The IBRD Sector Survey published in 1978 presents the normal comprehensive figures on progression rates, capital and recurrent costs, and the enrollments in training programs under a variety of governmental and non-governmental auspices. Similarly, the appraisal reports for the First, Second and Third Education Projects supported by the IBRD present the usual intensity of evidence on manpower projections for specialized skills and the like. On the other hand, there has been no previous work done on the economic returns to educational investments at any level; there is no available information on cognitive attainments; nor is there information available as to the relationship between education and an individual's economic productivity.
  
- iii. For the preparation of this report our intention has been to concentrate on areas of human capital investments which have not been commonly explored in Malawi. These include the following five: (a) the history of educational investments since before the turn of the century in an effort to explain why the education sector appears as one finds it today; (b) the quality of the educational facilities typically available; (c) the level of and influences on academic knowledge transferred by Malawian primary schools in contrast to schools in other countries; (d) the current productivity (or external efficiency) of secondary education; and (e) the importance played by achievement or "merit" criteria in the way persons become selected for training and, later, for employment. The location of these subject areas is evident from the section headings: the historical discussion is situated in section two; the discussion of educational quality in section three; economic returns to educational investments in section four; and the role of achievement criteria in section five. The conclusions derived from each of these separate discussions are summarized and compared to the conclusions drawn from earlier sector reports in section six. But in essence, however, the principal difference is that earlier reports sought to identify priorities for more immediate projects. By contrast, the intention here has been to identify investment policies and priorities which may be essential for the economic development of the country in the long-term.

### Historical Precedent

iv. It is only in the post-colonial era that the State has played an important role in human capital investments. In 1927 the 14 missionary agencies operating in Nyasaland invested ten times more in African education than did the Government. Total government expenditure on education typically amounted to less than two percent of the budget, which for Africans amounted to approximately 6d/pupil/year, less than one one-hundredth of the amount spent per European student. Missionary lack of financial capacity and curricular emphasis in directions other than on basic skills, account for the fact that with the exception of graduates from a few relatively well-known institutions, pre-World War II schooling was often insufficient to insure permanent literacy. Secondary schooling is so recent (1940) that the first generations of school leavers are still economically active. Only four secondary schools had been constructed prior to independence; and university education was entirely dependent upon external institutions.

v. In the post-independence period and as a result of the political pragmatism of the state to invite in non-Malawian low-cost teachers, secondary school enrollments have been able to expand by a factor of 12, from 1,300 in 1959 to 15,140 in 1978. This pragmatism, in turn, has led to a sizeable increase in Malawian economic participation at the top levels of the economy and civil service, including the secondary school teaching profession itself, which has changed from 80 percent expatriate to 29 percent expatriate in only 15 years.

### The Quality of Primary Education

vi. The number of individuals enrolled in primary schools increased by 30 percent between 1962 and 1972; and by an additional 57 percent between 1972 and 1978. Nevertheless, though significant advances have been made in the availability of classrooms, gross differences remain between Malawian students and students in wealthier countries in what they find in those classrooms when they enter. The basic economic mission made a survey of the quality of the education facilities and the amounts learned by students in a random sample of primary schools in Mulanje and Nsanje, two districts in the southern region. Even though the cognitive skills which the school is expected to transfer are often similar, the value of pedagogical equipment, furniture and supplies available to students in the sampled schools (approximately US\$5.19/pupil) is approximately one percent of the value of the physical materials made available to students in high income areas of the world every year. In the area sampled, for example, only one Malawian student in eight was found to have a seat; and only one in 88 had a desk. No climate, soil or history maps were available; and no student possessed a geography book, or a history book, science book, agriculture book, or a book on health science, despite the fact that two-thirds of the curriculum was allocated to those subjects. The likelihood of having a school roof or wall collapse is universally acknowledged; rain blows in through the windows with regularity; no school is equipped with electricity; there are no school meals or vitamin supplements available; no libraries; and no school medical supplies even for the most common illnesses and injuries.

Despite the fact that there are often hard-working teachers available, a solid course of study, and diligent parents and community leaders who make substantial sacrifices to provide an education, still, a significant proportion of facilities cannot be said to meet even a minimum criterion of what ought to constitute a primary school. Malawian students, in addition, are likely to be learning under a significantly lower status of health and nutrition, with over half of those in the area sampled reporting bouts with Malaria, one in five with bilhartzia, one in ten with trachoma and/or hookworm.

vii. Broad-based evidence to demonstrate the extent of the learning loss due to poor educational quality and low health status has only recently become available--from a large scale research project, the International Evaluation of Education Achievement. But only four developing countries (Chile, India, Iran, and Thailand) were among the 19 countries included. Achievement test items were chosen from the IEA Science and Reading Tests and were given to Standard 8 primary school students (average age: 16) in a random sample of schools in Mulanje and Nsanje Districts. The responses on these items were then compared to the responses of 10-year olds, usually 4th graders, from the 19 IEA countries. Naturally the Nsanje and Mulanje responses were influenced by the fact that the items were administered in English rather than a mother tongue; but English is the language of instruction, and our purpose was not to do an item-by-item analysis, but rather to see if the responses in Malawi would differ markedly from school environments in other countries which were not characterized by a scarcity of resources.

viii. It is not easy to judge the level of comparative efficiency with which schools transfer knowledge. Numerous conceptual and technical pitfalls exist and generalizations must be made with caution. However, these data--as imperfect as they are--do suggest that the average eighth grade student in Mulanje and Nsanje Districts in Malawi have learned less science and cannot read as well as the average 10-year old (usually fourth grade) students from any of the other LDCs in the sample; but they do not appear as disadvantaged in the area of sentence comprehension. Between the overall achievement levels of students in Thailand, India, Chile, and Iran, and students from the sampled schools in Malawi the differences are not pronounced. The major and most consistent difference in achievement is that between students who attend school in an environment characterized by a scarcity of resources. In lesser-developed countries, after the same (or more) amount of time in school, students emerge learning only a fraction of which is learned elsewhere. This is particularly true in Malawi where the pattern of correct responses to the achievement questions posed is between half and 75 percent of what is attained in Europe, Japan and North America.

#### Economic Returns to Educational Investments

ix. Despite a twelvefold increase in the number of students since independence, the chance of attending secondary school is still only three out of a hundred. This is typical of education and training in general: it is scarce, and its scarcity helps to determine its profitability as an investment--to the

society and the individual. The basic economic mission was able to utilize the results of a 1976 Tracer Study which covered students then sitting for their Junior Certificate and Malawi Certificate of Education (and their job status and earnings one and two years later) in 26 percent of all secondary schools of all types and in all areas of the country. The Tracer Study (together with data on the recurrent and capital costs of secondary education) leads to several interesting conclusions about unemployment and earnings for secondary school leavers and about the returns to investment in secondary education. In 1978, the rate of reported unemployment among males who passed their MCE examinations two years earlier was 0.7 percent, many times lower than for those who failed the MCE or for those who passed or failed the JCE. The earnings of MCE holders is sufficiently greater than that of JCE holders which suggests that the investment in secondary education is economically warranted. The economic social rate of return to secondary education ranges between a low of 14 percent to a high of 21 percent, depending upon one's assumptions. The range for private rates of return is approximately double that for social returns. Both are consistent with the returns from other countries in the region, which has some of the highest economic rates of return to secondary education in the world. However much growth which has occurred in secondary education since the 1960s, it appears that the demand for secondary graduates is still strong and that the productivity of such education is in significant excess of the capital and recurrent social costs.

#### Achievement Criteria and Economic Productivity

x. Suggestions emanating originally from academic institutions in industrialized societies, which hold that educational investments might act to cement social inequalities between one generation and the next, these suggestions should be put aside in the case of Malawi. Socioeconomic data from the 1976 Tracer Survey allow comparisons of each student's family background, his performance in school, and his later earnings in the job market. Students from family backgrounds of relative poverty--on the average--perform equally well on selection examinations as do students from privileged family backgrounds. Moreover, earnings do not appear to be determined by an individual's family economic position but by his (or her) education and ability to learn. There is, in essence, no reason to suspect that investments in education would adversely affect social equality; and there is very good reason to suspect that new investments in education and training are badly needed.

#### The Level of Investments in Education and Training

xi. Malawi entered nationhood with handicaps of many kinds--a scarcity of mineral resources, a primitive transportation network, a system of agriculture based--by and large--on the hoe, and a lack of human capital. Since independence some of these problems have been alleviated and the conservative prognosis of two decades ago in which it seemed unlikely that the economy of Malawi would be able to employ 20th century tools--machine tools, tractors, and the like--this prognosis was shortsighted.



xii. What is evident today is that Malawi in the 1980s and 1990s, like most nations, will depend increasingly upon these tools. The efficiency with which they are utilized, in turn, will depend upon the skill and quality of its labor force. But the level of human capital in Malawi is not yet competitive with other nations. This is so not because investments in human capital appear uneconomic, that is: because improvements in school quality do not affect learning, or because school leavers are unproductive. The facts appear very much to the contrary. Despite considerable growth since the 1960s, investments in education appear very economic indeed: school quality is a very strong determinant of the amount of learning generated by the system, and in contrast to what pertains in high income countries, the amount learned in school is the predominant influence on later economic productivity. School leavers are absorbed into productive activities with a surprising degree of efficiency and profit--both to the individual and to the general society. In sum, human capital in Malawi is uncompetitive not because of a lack of demand, but because of a scarcity in its supply, in both quantity and quality.

xiii. Because earlier IBRD documents worked from more narrowly defined sources of evidence, their recommendations diverge slightly from our own. They are, nevertheless, not inconsistent. All along it has been felt that primary education was in need of serious attention in Malawi. But previous efforts had to rely upon impressions to draw conclusions, and this scarcity of factual evidence on primary education permitted priorities of a comparatively secondary nature to surface in its place--"practical" subjects in secondary school, commercial education, and the like. In our judgement, however, the most critical contribution to be made by human capital investments toward the long-term development prospects of the general economy rests on the coverage and quality of primary schooling. Its coverage should be universal and its quality should be sufficient to increase the level of science, mathematics, reading comprehension and other basic skills up to a point where the labor force--other factors such as diligence held constant--is not at a disadvantage vis-a-vis other areas of the world. This will require long-range planning and a long-term commitment to investment resources. As best as we can estimate this will require the construction and equipping of approximately 460 new primary schools and the reconstruction of 1,150 (one out of two in the country) which are currently below the most minimum standards of quality. At the (1978) price of US\$43,000/school this will require the commitment of US\$70 million in new resources.

xiv. Second priority, without a doubt, is general secondary education. General secondary education is basic education throughout the entire industrialized world, and it would be a serious error in judgement were development agencies do not recognize the inevitable consequences of limiting "basic" education in a low-income country to a level lower than international standards. Planning for secondary education will require a general recognition wherever it is discussed in economic circles that the nature of general secondary education implies neither high level intellectual skills, nor specialized skills. Though today Malawi is impoverished, it requires only a moderate amount of vision to recognize that in the future it will require universal secondary

education as it now requires universal primary education. The question therefore is not whether, but how fast to proceed. Planning for the expansion of general secondary education will require a balance between private demand and public finance. In this regard, close attention should be paid to the use of evidence in addition to manpower estimates. Current levels of demand, at today's prices, would suggest that the level of secondary school capacity should expand as it has in the past, at approximately 10 percent/year (1,500 places). This would imply a capital investment (in 1978 prices) of US\$6 million in year one and a total investment program between 1978 and the year 2000 of approximately US\$432.4 million, again at 1978 prices. If the returns to educational investments remain as consistent in the future as they have in the past, then in the year 2000 Malawi ought to have approximately 123,000 available places in secondary schools. This "ideal" program is prevented, however, not by a lack of economic justification, but by a lack of capital which is likely to be available. More realistic in this regard is the Ministry of Education's own target of a 6 percent enrollment growth rate per annum. If this target is met, it would imply an investment program in year one of US\$3.6 million (908 student places), and an allocation of US\$157.7 million over the next two decades (at 1978 prices). This would obtain a secondary school enrollment capacity of 55,000 students by the year 2000. However, from the evidence currently available, our recommendation would be that the six percent per annum growth rate be used as a minimum.

xv. Placing emphasis upon primary and secondary education does not imply that there are not other needs as well in higher education, research, evaluation, management, business administration and the like. Nor do these emphases imply a rigid lock-step process, that is, to not invest in priority B until priority A was 100 percent complete. Emphasizing primary and secondary education simply recognizes the inevitable--that a solid foundation must be constructed before a system can expect its higher level training--specialized or non-specialized--to function at a point near efficiency. Emphasizing primary and secondary education moreover implies a need for long-range as opposed to project-by-project planning. In this effort we would recommend a partnership between Malawi and those development institutions which have both long-range interests in Malawi and the ability to make long-range planning commitments. At the very least Malawi should--from a variety of sources--be investing a minimum level of new resources of US\$7.9 million/year in secondary education and US\$3.5 million/year in primary education (US\$11.4 million/year) over the next two decades. This US\$228.0 million investment program in basic education would be sufficient to lay the human capital foundation required for economic development in agriculture, commerce and manufacturing. Without it, progress in other sectors will be inhibited by lack of the basic skills necessary to deal with the inevitable changes in economic organization and technology that can be anticipated between 1980 and the year 2000.

## EDUCATIONAL BACKGROUND

### Pre-1960

1. The status of Malawi's human capital cannot be understood without a brief review of the magnitude and content of early investments. The country's ability to expand and improve each economic sector is based in part on its ability to draw upon a stock of educated labor. By all accounts its current stock is small. This is so for three principal reasons. First of all its entry into the international political economy dates back less than a century under foreign rule, 1/ and less than two decades as an independent power. In contrast to Brazil, Mexico, India and other areas of the world, the time available to have generated a stock of educated labor has been comparatively brief.

2. Secondly, the scarcity of educated labor available today is also a function of colonial education policy, particularly in the way it was financed. Educational finance mirrored that of the 19th century British metropole - the responsibility fell primarily on private voluntary agencies which had only small amounts of development capital. The role of the state, which by comparison had access to large amounts of development capital, was peripheral. For example the 14 missionary agencies operating in Nyasaland in 1927 invested ten times the amount in African education as did the Government. 2/ Furthermore what resources the colonial government did allocate to education were allocated in lopsided fashion - 177 times more per pupil was spent on European than on

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1/ The first school was probably established in 1880.

2/ Government grants-in-aid in 1927 totalled E 4,295; mission expenditures totalled E 41,525. In addition, finances from school fees totalled E 1,768.

African children. Total educational expenditure amounted to less than two percent of the governmental budget. Among Africans this amounted to approximately 6d/pupil (Table 1).

3. Lastly, curriculum too has inhibited the amount of educated manpower available. Mission education borrowed heavily from the ideas of "negro education" in the southern United States: beyond literacy and religion, emphasis was placed upon those elementary vocational skills which were thought to be 'practical' for the 'native' population--smithery, carpentry, and a few simple rules of crop production. 1/ However much they were assumed to be needed at the time, these curricular emphases were not even sufficient to insure literacy, much less for generating managerial talent. Despite the fact that 97,567 students (13 percent of the total population) were enrolled in school in 1911, 34 years later census enumerators could find only 39,132 literate people (7.2% of the population); and of those, 85 percent were literate solely in a vernacular (Table 2). 2/ In sum, to know that there were so many thousand 'scholars' 3/ attending classes in a given year tells us precious little about the degree of investment in human capital. On the other hand the small amount of monetary investment/pupil and the short-sighted choice of subject matter both suggest that the sum total of the educational experience, for most, was transitory.

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1/ The exception to this was the curriculum of the United Free Church of Scotland which, over the objections raised by the European planters and the government, taught not crop production but biology, algebra, geometry and English (Heyneman, 1972).

2/ Source: Nyasaland, Census of 1945. (Zomba: Government Printer.)

3/ 'Scholar' is the term used in government reports to describe a student in an educational institution previous to independence.

4. First post-primary training commenced in Livingstonia with the inauguration between 1900 and 1910 of a four-year post-primary "junior school", a three-year (post-junior) normal school, and a theological seminary. 1/ Until 1940 however there was no genuine secondary education available anywhere in the Protectorate. On an initial government grant of \$12,486 Blantyre Secondary School was opened in 1940 under the auspices of the Church of Central Africa, Presbyterian (CCAP); and a second secondary school was constructed by the Roman Catholic Church at Zomba in 1942. Prior to independence only two secondary schools had been constructed with government funds: Dedza (1951) and Mzuzu (1959). These four schools - in Blantyre, Zomba, Dedza, and Mzuzu - provided the only secondary education previous to independence. Thus it is no surprise to find that when full political and administrative control was transferred in 1962, only 33 Africans had completed a university education. Right from the outset of independence the depth of the pool of educated labor from which the nation could draw for counsel, planning, administration, and entrepreneurial enterprise, by most international standards, did not exist.

#### 1960-1979

##### Elementary Education

5. In 1961 the last of three pre-independence commissions reviewed the prospectus of education. 2/ Its report became the basis for major structural

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1/ Many mission stations conducted post-primary classes in "technical" subjects--for girls: the making of soap, lace, starch, oil refining, sewing, and laundry--for boys: gardening, carpentry, tailoring, book binding, storekeeping, cookery, clerking and the like.

2/ The first was the Memorandums on Native Education in the Tropical Dependencies published by the Phelps Stokes Fund in 1924; the second was the Report of the Binns Commission, East and Central Africa Study Group sponsored jointly by the Nuffield Foundation and the Colonial Office in 1951; the third was the Report by the Committee of Inquiry into African Education published by the Phillips Commission in 1962.

change in the post-independence period, the most important being the recommendation for greater public control over educational organization, development and finance, and the concomitant decline in the role of voluntary agencies. The Central Government, through an expanded Department (later Ministry) of Education took control over the establishment of uniform levels of school fees, curriculum, teacher standards, teacher allocation, post-primary standards of admission, testing and selection, school inspection and most important of all-- teacher salaries. 1/ This latter category, a commitment of expenditure previously extracted from school fees, 2/ and accounting for over 90 percent of the recurrent costs of primary education, 3/ allowed for the development of new classrooms on an unprecedented scale. The number of pupils in primary schools increased by 30 percent between 1962 and 1972; and by an additional 57 percent between 1972 and 1978. In 1959 there were 293,480 pupils enrolled in primary schools, with 2 percent of them in standard eight -- the top grade. In 1978 there were 675,740 pupils enrolled, with 8 percent at the top grade level (Table 3). 4/ Thus despite the fact that government funds have only

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1/ Today 42 percent of the recurrent expenditure budget of the Ministry of Education is allocated to primary education, 19 percent to secondary education, and 23 percent to higher education; the remainder is allocated to teacher training, vocational education, and correspondence education.

2/ One category of school governance was not transferred to central authorities - the responsibility for school building construction, maintenance and the purchase of equipment, books and furniture. These continue to be financed through school fees which are collected from parents but administered by local district councils or local district educational authorities rather than the school themselves.

3/ This is no testimony to high teacher salaries; rather it is an indication of how spartan are other facilities normally thought to be available in primary schools.

4/ Excluding population growth, the ideal would be 12.5 percent assuming a uniform level of entry in standard one, from one year to the next.

rarely been used for primary school construction, the size of primary education has doubled since independence, and the rate of efficient progression from one grade to the next has quadrupled. 1/

### Secondary Education

6. Financial and administrative changes in post-primary education were slightly less radical: new policy continued what had already become a growing tendency for the Central Government to take an active role in both development and governance. The rule of thumb applied then, as now, was for the Central Government to finance what was assumed could not be generated through parental contributions. Thus in addition to setting standards for curriculum, inspection, teacher training, teacher allocation and remuneration, as it had with primary education, the Central Government took complete control of secondary and tertiary education planning, construction, and the provision of furniture and equipment.

7. Supporting these new education responsibilities, however, was not a simple task, for the Protectorate at independence was severely short of budgetary and foreign exchange resources. The net balance of payments deficit in 1965 amounted to E 8.5 million; the external debt service ratio was 25 percent of government revenue; and the level of already-committed recurrent

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1/ Perhaps it is worth noting that the proportion of the total population enrolled in primary schooling (about 12 percent) has remained essentially constant since 1911 despite the fact that the number enrolled has increased seven times (Table 3). Also worth noting is that the attendance rate for the primary school-aged cohort has remained constant between 1963 and 1979 (about 56 percent). This latter is due to two facts: a substantial increase in the number of children in that age group, and the fact that the norm for primary education is now considered eight years instead of five.

expenditures was E 4.5 million over that of government receipts. Capital investments had to be financed through governmental borrowing and foreign assistance. There was no concensus among economic experts as to whether Malawi would later be able to finance recurrent educational expenditures. 1/ In spite of these doubts ten new streams for 550 new secondary school students were made available between 1961 and 1962. Over the 20 years between 1959 and 1978 secondary school enrollment increased 12 times, from 1,300 to 15,140 (Table 4). 2/

8. This expansion was only possible because of the availability of large numbers of low cost foreign teachers. In 1965 over 75 percent of the secondary school teachers teaching in Malawi were expatriate; over 50 percent were from the Peace Corps alone. In all 731 volunteer teachers served in Malawi between 1962 and 1970: 37 from Canada, 200 from the United Kingdom, and 494 from the United States (Table 5). 3/ Because of the secondary school

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1/ These doubts were later proved to be wrong.

2/ Despite the expansion of secondary school places, the chance for a primary school student leaving standard 8 to enter Form I is less today (1979) than it was before independence. In 1959 it was 12 percent, today it is 9 percent. This is not an indication of neglect for secondary education. Instead it indicates that in spite of the unprecedented growth of secondary education since independence, the growth of primary education has kept abreast and has surpassed it.

3/ The term "volunteer" is not entirely uniform since the terms of service were negotiated with each organization separately. The difference in cost to the Malawian government was substantial. Despite qualifications of a comparable standard the annual unit cost for a Canadian CUSO was 14 percent higher than for a British VSO and 40 percent higher than for an American Peace Corps Volunteer--who was the least expensive of all expatriate teaching personnel save that of missionaries (Table 6). All volunteers however, despite significant differences in cost among them, were substantially less expensive than expatriate "contract" teaching personnel.



students which were generated during that period, today the ratio of expatriate/local teachers is the reverse of what it was in 1965. Of the 737 secondary school teachers teaching in Malawi in 1979, only 211 (29 percent) are expatriates.

#### University Education

9. Higher education in Malawi is 15 years old. Today university level course work is taught at three locations -- at the Bunda College of Agriculture (Lilongwe), at the Polytechnic (Blantyre), and at Chancellor College (Zomba). Though the increase in the total number of students enrolled has been substantial (Table 7) -- from 487 in 1966 to 1,322 in 1978 -- 60 percent of the students are still enrolled in course work which leads not to a degree, but to a diploma -- usually in agriculture, education, engineering, public administration, or business studies. 1/ Recurrent unit costs are ten times higher than those incurred in secondary education, 2/ principally due to the high proportion of expatriate staff at the university on international contract terms, and to the low student/faculty ratios -- 10:1 at Bunda, 8:1 at the Polytechnic and 6:1 at Chancellor College. On the other hand, though the costs of university education in Malawi are high by comparison to secondary or primary education, still they are 30 percent below those incurred for higher education at a comparable level in the United States (Table 8). 3/ This

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1/ Unlike a degree, a diploma cannot be judged on the basis of international standards of equivalence.

2/ 1978 recurrent unit costs were as follows: Chancellor College - K 2,580 (US\$3,225); Polytechnic - K 2,427; Bunda - 1,968. Average recurrent costs for secondary education range from K 150 - 214. Unit recurrent cost for primary education is approximately K 16/year.

3/ For example, 1979 student/faculty ratios at the University of Maryland are 20:1; unit recurrent costs are US\$4,580.

latter difference is due principally to the lower level of physical resources available in Malawi in comparable programs, that is - fewer library, laboratory, computer and other physical facilities.

10. Graduate education is still in its infancy. By 1978 only seven graduate students at the University of Malawi had been able to complete their masters degree theses; only one had completed a Ph.d. Furthermore, the number of Malawians studying abroad has remained virtually constant over the last decade: 561 in 1966, 577 in 1977 (Table 7). Of these latter, 15-20 percent are only attending short-term courses in such things as police work, fisheries, civil aviation, post offices, printing, navigation, librarianship and the like. About 135 are studying engineering; 66 medicine; 35 accounting; and 42 education. In 1977 there were only 14 Malawians studying graduate level science, and only 17 studying in any of the social sciences. Even at the highest levels of commerce, administration, and planning, Malawi, a country with a population of five million, is managed by individuals with certificates, a bachelors degree, or at the very most, with a masters degree.

#### THE QUALITY OF HUMAN CAPITAL

11. The fact that Malawi has made substantial progress in placing individuals in classrooms passes over the issue of what is learned after entry has been obtained. Significant changes have been made in the curriculum at all levels since independence. Before 1962 for example, history and geography were oriented principally toward the British Commonwealth; today these subjects concentrate on Malawi itself, on Africa, and on Europe and the Americas, in that order of priority. New course work is available in agriculture, health science, technical drawing, commerce and nature study. Changing the content

of what is learned is the least of the problems facing human capital development in Malawi. The real problem is how much is learned, and by how many.

### Basic Cognitive Skills

12. One task of elementary schooling is to transfer the skills of reading, science, and mathematical computation efficiently and to the entire age relevant population. Though pedagogy may differ substantially between one country and the next, the skills a school is expected to transfer are universal. Furthermore, success of this transfer at the elementary level makes the task of subsequent learning -- whether in secondary school or in the labor market -- that much more efficient. Failure to transfer the basic skills efficiently suggests the opposite: marked inefficiency at the secondary school level, and lower levels of productivity in any out-of-school endeavors (such as farming) which include the manipulation of numerical and scientific information, and the absorption of print.

13. Measuring the amount of knowledge transferred by schools in different countries is not a simple task. It first requires an agreement on the subject matter to be tested; it then requires an agreement over the way it is to be tested; and lastly the manner of choosing who is to take the test. Each of these conditions was met by the 19 countries participating in the International Assessment of Educational Achievement (IEA). 1/ The Basic Economic Mission did not have the two years that it takes to do an achievement study of comparable complexity, 2/ and therefore could not meet each of the conditions which prevailed in the 19 IEA participating countries. 3/ Achievement test items

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1/ See Annex 6 for a bibliography of IEA techniques and findings.

2/ The IEA studies included five subjects and three age groups.

3/ Conducting an IEA study of Mathematics achievement has been listed as a very high priority by the Ministry of Education. See: (Ministry of Education, 1979: 50-51).

were chosen from the IEA Science and Reading Tests without being scientifically pretested in Malawi. These results from Malawi furthermore, though from a sample of randomly selected schools, 1/ are affected by the fact that the achievement tests were administered in English rather than Chichewa or one of the other Malawian languages. English is the chosen language of instruction however, and only the students at the Standard 8 level -- the top grade in primary school -- were chosen for participation. On an average these students were 16 years old. 2/ Here these Malawian scores will be compared to 10 year olds in other countries, usually at the 4th grade level; this should perhaps offset some of the Malawian linguistic disadvantages. Nevertheless it is important to be able to compare the performance of students regardless of whether the test is administered in the language spoken at home. The purpose is to gauge the ability of schools, operating under different economic circumstances, to transfer certain comparable skills in whatever the chosen language of instruction. A listing of the exact items can be found in Annex 8. These are the results:

#### Science

14. Malawians in grade eight from Nsanje and Mulanje Districts got 42 percent of the IEA science achievement items correct. This was better

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1/ The Malawian data, as in Iran and India, do not represent the nation at large. Scores are derived from one of the three regions. Two districts within that region were chosen because they reflected quite divergent levels of economic development; and schools within those two districts (17% in Mulanje; 14% in Nsanje) were chosen at random. Thus the Malawian data genuinely reflect the average eighth grade student in those districts, but less than full certainly exists with respect to how representative the data are with regard to the region or the nation. Questionnaire achievement test items were pretested in each of the IEA participating countries. Later they were placed in a scale ranging from facile to the more difficult. In Malawi the vocabulary and cognitive skill of the questions used were judged to be covered by the school curriculum but were not scientifically pretested. Only the easiest questions in the IEA data bank were used however.

2/ 3.5 percent were 19 or over; 45 percent were 17 or 18; 23 percent were 16; 27 percent were 14 or 15; 2.5 percent were younger than 14.

than the 10 year olds in Chile and India (36 percent), and Iran (39 percent) who answered the same questions. But the percentage correct in Malawi is lower than that of Thailand (47 percent), Netherlands (48 percent), Germany (51 percent), Italy (55 percent); and lower than Japan (61 percent), Sweden (60 percent) and the USA (61 percent) by a very large margin. Malawian scores, while nine percent above the mean for LDCs, still appear approximately 23% below the mean for the industrialized societies (Table 9). 1/

#### Reading Comprehension

15. In Reading Comprehension the proportion of correctly answered items in Nsanje and Mulanje Districts was 34 percent (see Table 9). The Malawian score is significantly lower than that of Iran (39%), India (53%) and Chile (61%); in fact the level of reading comprehension ability is below that from any other country on which we have comparable data. The Malawian score is 27% below the mean for other LDCs and 50% below the mean for industrialized countries in the IEA sample.

#### Sentence Comprehension

16. The results for Sentence Comprehension are not as severe. On these items the proportion missing none or only one in Malawi (61 percent) was higher than for India (27 percent), Iran (39 percent) and Chile (42 percent), and about 44 percent above the LDC mean. Nevertheless it is significantly below that of England (32 percent), both Flemish and French-speaking Belgium (85 and 88 percent) and Sweden (88 percent); and 23 percent below the mean for industrialized societies. 2/

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1/ Only the responses to questions used in Malawi are being utilized in these comparisons.

2/ Sentence comprehension scores are influenced by two technical details which tend to raise the Malawian scores by comparison to the others. There were nine items on the test. Malawian pupils however were allowed to use the first two items for practice, thus increasing the possibility for answering all the items correctly or missing only one. This constitutes a 22% advantage. Also in Malawi there was no time limit imposed.

17. It is not easy to judge the level of comparative efficiency with which schools transfer knowledge. Numerous conceptual and technical pitfalls exist and generalizations must be made with caution. However, these data - as imperfect as they are - do suggest that the average eighth grade student in Mulanje and Nsanje Districts in Malawi have learned less science and cannot read as well as the average 10-year old (usually fourth-grade) students from any of the other LDCs in the sample; but they do not appear as disadvantaged in the area of sentence comprehension. Between the overall achievement levels of students in Thailand, India, Chile, and Iran, and students in Malawi the differences are not pronounced. The major and most consistent difference in achievement is that between students who attend school in an industrialized country and those who attend a school in a lesser industrialized country. In lesser-industrialized countries, after the same (or more) amount of time in school, students emerge learning only a fraction of what is learned elsewhere. This is particularly true in Malawi where the level of academic achievement attained (after four more years of schooling) is between half and 75% of what is attained in Europe, Japan and North America.

#### Origins of Low Educational Achievement

##### Health

18. Schools in Malawi transfer knowledge less efficiently for at least three reasons. 1/ First of all schools can be effective only when pupils are physically able to learn. In Malawi the physical health of students parallels that of the general population: students, on the average, are handicapped by poor health. Of the 269 students in the schools visited by the Basic Economic

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1/ The general economic level of a child's home, a fourth reason, is a factor over which the school has no control.

Mission, 15 percent had nothing to eat for breakfast before coming to school; 11 percent had received medical treatment for problems of trachoma; 21 percent had received treatment for problems of bilharzia; 10 percent for hookworm; 54 percent for malaria; and 55 percent for "wounds" and their subsequent after-effects. Forty-six percent said that they had fever at least once each month, and a full 72 percent said that they are frequently treated for "headaches". This assessment of their own physical ailments may not be as accurate as obtaining information from clinical examination. What these figure do accurately reflect, however, is the fact that the average pupil in Malawi suffers from an array of physical disabilities on a scale and with a frequency unparalleled among schools operating in industrialized societies.

#### The Availability of School Resources

19. Just as certain standards prevail with regard to engineering a bridge or manufacturing steel, in the industrialized countries there has gradually emerged a common standard for school construction and classroom facilities. At the minimum a school is acceptable if it can provide a place for students to work without the danger of a roof collapsing; if neither wind nor rain send students into a corner for protection; if there is a place for each to sit down, a place to write, materials to write with, and a certain minimal number of maps, charts, and reference books from which to derive information. This level of school facilities has pertained since before World War II. Since the war the norm has been raised however. In Japan, in the United States, in OECD countries, and in countries of the socialist bloc, schools have become uniformly equipped with electricity, and have been given access to a wide variety of electronic media to supplement print. And now this too is changing. Now it is normal for schools to have specialized

facilities and specialized personnel: librarians, nurses, shop teachers, psychologists, experts in physical fitness, bus drivers, cooks, and others. In 1975 the average OECD country invested 33 times more per primary school pupil than did those 36 countries with less than US\$265/year per capita incomes. <sup>1/</sup> And the gap is widening. Because schools are constantly being asked to transfer more and more information, per pupil investments are rising faster in high income countries than in countries with low incomes.

20. This is not to suggest that all schools require the maximum level of facilities. In times of fiscal scarcity, debates ensue throughout the industrialized world about what is essential. Nevertheless the physical quality of primary schooling in Malawi has not yet reached stage one - a standard universally attained among industrialized countries prior to World War II. School construction, even among those recently built, are without standards of safety. Walls frequently collapse; roofs have large holes; wind and rain disrupt classroom activity as a matter of course. Classrooms are dark and stuffy. Students are forced to squat on the ground and write by balancing an exercise book or slate on their knees. Teachers have no office; often no desk, and sometimes, not even a chair. Student desks, if available, often wobble on three legs; chairs have no backs; stools have but half a seat. In the survey conducted by the Basic Economic Mission, only one pupil in eight was found to have a seat at all; and only one in 88 had a desk. One of the randomly selected schools, with 712 pupils, did not have a single chair or desk available (Table 10). In an industrialized country the schools without these basic elements would be closed down as being unsafe and unsound; in Malawi out of necessity they remain open.

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<sup>1/</sup> World Bank, Education Sector Policy Paper, Washington, D.C.: IBRD, September 26, 1979; Heyneman and Jamison (1980c).



21. Each school visited by the Mission had an average of two maps; but many had none. Maps were rarely on a wall, rather they were stored away. All were out of date; some even contained the word Nyasaland, the name of Malawi pre-1963. All maps were of political geography. The Mission saw no climate, soil, or history map, despite the fact that geography, history and agriculture are standard subjects.

22. No student in any school surveyed possessed a Geography book; or History book; or Agriculture book. There was not a single book available in Health Education or Religion or General Science, despite the fact that students spend two thirds of their time between Standard 1 and Standard 8 attempting to study these subjects (Table 11). No primary school had a library. There is, however, a high ratio of Arithmetic, English and Chewa books (one book/two pupils in each of the three subjects); and these are very equitably distributed, between schools and between the two districts despite the fact that one district had a much larger per capita income (Table 11).

23. In FY79 a district in the State of Maryland was able to invest US\$518 per pupil towards the purchase and maintenance of furniture, reading materials and equipment. Manyamba Full Primary School, by contrast, was able to invest US\$1.51/pupil. Nor was this atypical. Nyezelera was able to invest US 52 cents/pupil; Mangazi US 98 cents/pupil. The average level of investment/pupil for the schools which fell into the Basic Economic Report sample was US\$1.24. 1/ Moreover the value of accumulated stock is not much in excess of an investment in a given year. The average school in the sample was in

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1/ These figures are derived from financial records at the school. Each piece of equipment received by the school in that year, each box of chalk, each exercise book, textbook, soap, cooking oil and the like were added up and their value computed at current price levels (see Annex 1).

possession of furniture and equipment worth approximately K. 4.15/pupil (US\$5.19). This is one percent of what might be invested/pupil at the same grade level in an industrialized nation in a single year (Table 10).

#### School Government Since Self-Government

24. Low achievement of the Malawian primary school system is not entirely a function of health problems and spartan facilities, for these constraints characterize other low-income countries too. In Malawi low achievement may derive also from poorly managing what resources it already has. Before independence primary education was financed and managed by the various religious bodies, town councils, and private entrepreneurs. The quality of school fee management varied as did educational quality in general; both depended to a large extent upon the diligence and fiscal management of the Headmaster and a school's Parent Committee to which he was responsible for employment. Parent Committees frequently consisted of elders from the local church or mosque who, through often unschooled, tended to be individuals of strong stature and local reputation. Schools and school systems were competitive. If one school acquired a low reputation because of inappropriate administration of school fees or low achievement, parents were free to choose an alternative school if one were available. There was, in essence, a fledgling market mechanism.

25. In the post-independence period the responsibility for governing primary education was transferred away from the schools themselves and placed elsewhere. The central government took control of curriculum, post-primary admission standards, testing, selection, inspection, teacher standards, teacher allocation and teacher salaries. But not primary school construction

or primary school supplies. All goods and services of this nature 1/ continued to be financed through school fees. Nevertheless the management and control of school fees were transferred away from the school. Neither the Headmaster nor the school's Parent Committee today have any control over the establishment of school fees or their management.

26. School fees are collected from parents on the understanding that the money will be used to purchase books and equipment which will in turn be used by their children. However, the understood arrangement diverges markedly from actual experience. Manguzi Full Primary School for example collected K 624 from its students in FY78 and turned this money over to the Mulanje District Council. In the same year it received K 253 in books equipment and supplies-- 41 percent of what it collected. The next fiscal year it received 39 percent of what it collected. Over the last two fiscal years the most received by any of the randomly-selected schools analyzed by the Basic Economic Mission was 50 percent; the least was 5 percent (Annex 4). 2/ The average for the schools in the sample was 17 percent (FY78) and 41 percent (FY79).

27. There is little chance of raising the level of achievement in Malawi's system of basic education without altering the way it is financed. Though school supplies currently account for less than five percent of the (primary education) budget, the entire development of primary education depends upon a constant flow of books, furniture, equipment and school maintenance. These in turn are supposed to be financed entirely through school

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1/ Includes school construction, books (for pupils and teachers), furniture, maintenance, maps, charts, pencils, exercise books, school meals (if any), sports equipment, science equipment, farm and house craft equipment and the like.

2/ No data on school finance was collected from schools in Nsanje District.

fees; yet the school has no direct authority over how these resources are administered, 1/ and it appears that a significant amount of these resources never return to their source. Moreover the level of these fees is standardized by the Central Government which prohibits parents and local communities from raising the level of educational quality from their own sources of finance. In essence the quality of basic education is being squeezed simultaneously from two sides: what resources it does manage to raise are not invested back in the school from which they came; and schools are prohibited from raising additional resources in compensation.

Available Options

28. There are several administrative options which might be considered for more efficient management of resources for primary education:

- (i) eliminate school fees and finance primary education development and recurrent costs through Central Governmental resources -- as in the case with post-secondary, secondary, and primary education teacher salaries;
- (ii) withdraw restrictions on the level of school fees and allow school and parental authorities to manage their own development programs;
- (iii) maintain a uniform level of school fees, but transfer their management to school and parental authorities.

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1/ For the last 15 years primary school fees were administered by local District Council Authorities. In 1979, however, this responsibility was shifted to the local educational officials. This is likely to be an important improvement, but it is no guarantee that school fees will return to their source with 100% efficiency.

Choosing the first option would generate the fastest development and, if properly managed, would distribute investments in an equitable fashion. The second option would insure an improved standard of efficiency because monies would be managed at their source of collection. But as in any market environment it would also generate uneven development: some schools and some areas would be willing or able to invest more than others. The latter would remain backward for longer periods of time. The last option would represent the least radical change. It would definitely lower the deficit in school facilities, for it would re-channel finances back to their intended use. But neither the last option, nor the previous two, is any guarantee that the resources, regardless of how efficiently managed, would be sufficient to raise the achievement levels to what they should be.

29. To attack the problem of low academic achievement seriously what we would recommend is the following: (i) "Capital" costs should be financed through the central government, thus expanding the "capital" content of governmental expenditures and making it easier for development institutions to finance primary education; (ii) What is defined as a "capital" cost should be expanded to include items judged to be absolutely essential for the operation of a school of minimal quality -- furniture, textbooks, maps, chalk, blackboards, etc.; (iii) All school fees should be applied to truly recurrent costs -- maintenance repairs and the like; (iv) School and parental authorities, if they wish, should be free to raise additional financial resources by paying school fees above the national norm or by any other means (sale of school crops, dinners, festivals for the public, etc.). The benefits of these fund-raising activities should not return to to any general pot, rather they should be spent in situ - on a library, a school football field, on whatever the local populace judges as most appropriate.

## EDUCATIONAL INVESTMENTS AND ECONOMIC PRODUCTIVITY

### Background

30. Knowing the level of monetary investment/pupil, or the number of pupils/textbook, or the level of reading and science comprehension - these are indications of the system's functional quality, and its internal efficiency. But investments in education are made for reasons other than the belief that education is good and that the educational system should function efficiently. Investments are made because of the belief that they will be economic; in fact, that they are a necessity for economic growth. The key for gauging the degree to which educational investments are economic is to assess the productivity of those who have been "the products" of that investment.

31. The productivity evidence from Malawi originate from a Tracer Study of the second and fourth year secondary school cohorts of 1976, a study conducted jointly by the Ministries of Labor and Education. Data were collected at three points in time: (i) in 1976 when all students were sitting for their Junior Certificate (2 year) and Malawi Certificate of Education (4 year) examinations, (ii) one year later (1977), and (iii) two years later (1978). Thus employment information exists on those who completed two and four years of secondary school, one and two years after they had entered the labour market. 1/ The sample of 16 schools represented 26% of all the secondary

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1/ Because secondary level education is "Basic education" in high income countries, secondary school expansion in Malawi is rightly seen as a concomitant of economic development. The number of students has increased 12 times since 1960, and the monetary investment, in relative terms, is a significant burden. Nevertheless, despite substantial growth, less than 3% of an age cohort today is able to attend secondary school. The pressure and potential for secondary school growth is real; therefore the results of past investments to expand secondary schools may be perhaps the most important to monitor.

schools in the country. The schools were drawn from all the regions and from all institutional categories - day, boarding, assisted and unassisted. The sample comprised 100% of those attending the JC and MCE levels at the sample schools. In sum, whatever tendencies are reflected in the results may be taken as broadly representative of the nation at large. For more detail see: (Ministry of Labour, 1977).

32. Of the 928 individuals in the sample schools who sat for their JCE or MCE examinations in 1976, 85% were traced one year later and 78% were traced two years later. Thus the non-response rate, though it grew between year one and year two, is relatively small (22%). About one half of the sampled individuals were still in full-time educational or training institutions one year (51.8%) and two years later (49.6%). Of the remainder, 12.6% described themselves as being unemployed after year one; but this figure had dropped to 6% by year two (Table 12).

33. Very significant differences exist in the proportion of those who, two years after leaving school, find themselves unemployed. The largest difference appears to be a result of whether an individual passed or failed a test of academic achievement (see Table 13). Males - or females - who failed their JCE examinations were four times as likely to be unemployed as those who passed. Of the males who failed their MCE examinations 11.3% declared themselves to be unemployed two years later; of those who passed only .7% were unemployed (Table 13). The difference in unemployment rate between females who passed and females who failed their MCE examinations, though not as dramatic, is still quite evident (7.8% v.s. 18.9%). 1/

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1/ With regard to whether employers reward new job entrants by irrationally paying them higher as a result of an educational certificate, there are two hypotheses. One is "weak" - that they pay them irrationally at the initial hiring point - and one is "strong" - that they pay them irrationally thereafter (Pscharopoulos, 1980b). If either hypothesis is true in Malawi, it is the "weak" one.

34. Of those who were working, approximately half found employment within the civil service (48%) and another 16% with a statutory body (Table 14). That the remaining 36% found employment in the private sector is somewhat significant in a country of Malawi's level of economic development where the public sector is often the predominant and sometimes the sole employer.

35. Most of those employed (67%) found work as clerks, tellers, and other related jobs (Table 15), frequently in the agriculture, forestry, and fishery sectors (Table 16). Eight percent of those who left secondary school (after either two or four years) described themselves as farmers, fishermen or foresters. A fairly substantial proportion found employment in the transportation Sector (12%), in wholesale or retail trade (16%), or in general public administration and defense (15%).

36. Of the 207 males who left the education system in 1976 and were traced two years later, 176 were employed and 31 were either unemployed or not looking for work and not in training. Earnings for those who found work after two years of secondary school averaged K 28.5/month; and after four years of secondary school K 44.8/month. After deflating these figures by the number of those in the labor force but who couldn't find work however, the average earnings were K 17.1 for those with two years and K 40.3 for those with four. The difference between these figures (40.3-17.1) will be used as earning streams in the calculation of the economic rates of return. These and other figures on earnings are displayed in Table 17.

#### Economic Rate of Return to Investments in Secondary Education

37. By estimating the economic benefits of investing in education by no means do we imply that economic gains are the only benefits from educational investments. Indeed there are others - cultural, social, political - and they



may be paramount. 1/ Nonetheless, measuring economic returns gives some indication of how much the educational system is contributing to the economy and provides a means of comparing educational investments with investments in other sectors. Though we would not suggest that there is an exact science to this process, still when investment choices have to be made it helps to be equipped with measurements along the same scale. In this case the scale, or at least one scale, is the economic rate of return.

38. Returns to investments in human capital are calculated in much the same way as calculations for returns to physical capital, i.e. the discounted lifetime productivity of the investment is compared to the discounted costs of the investment. 2/ The internal rate of return is the discount rate which equates the present value of an income stream (PV ) with the present value of a cost stream (PV ). There are two basic categories of internal rates of return to human capital investments--social and private. The social returns are the monetary (or non-monetary) returns which can be expected to accrue to the society as a result of its investment in education. Because all public capital and recurrent costs are included in the calculations, social returns tend to be lower than private returns. Private returns are those which can be expected to accrue to an individual as a result of his personal

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1/ The term "social benefits" has at times been used to connote the sum total value of education in either public or private life--the potential for lowering the infant mortality rate, the improvements in communication, etc. Though clear in concept, no one to our knowledge has successfully been able to quantify these externalities either in psychic or in monetary terms. Here we will use the term to imply only the monetary benefits from increasing individual productivity which accrue to a nation as a result of an investment in education.

2/ With an investment in human capital, productivity is calculated by subtracting the income stream of one level of education or training from the income stream of a higher level.

investment in education. Costs include only those shouldered by the individual during training: tuition, foregone earnings, and living expenses if at school the living expenses are above what would ordinarily be experienced. 1/

Costs

39. There are basically four categories of costs which must be considered:

- (i) private direct costs--tuition, fees and living expenses in excess of the ordinary;
- (ii) private indirect costs--earnings foregone while undergoing education or training;
- (iii) capital costs for supplying the physical facilities and equipment;
- (iv) recurrent costs for supplying the teachers and maintenance of the physical facilities.

40. Capital costs are in the main borne by governments. In Malawi's case, however, a significant portion of the capital costs have been shouldered by agencies other than government--through religious organizations or more recently, through grants or low interest loans from bilateral donor agencies or multilateral banks. The level of capital which was necessary to create a "student place" in 1978 in the secondary schools where most of these students were educated was approximately K3,046. 2/

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1/ Other costs, such as taxation assessments, which accrue to the individual after completing training should be included if the data are available.

2/ The capital cost for creating a student place in a secondary school in 1979 is approximately US\$4,000 depending upon the size of the institution and its proximity to transportation and other factors. Since the rate of inflation was approximately 9% between 1978 and 1979, the US\$4,000 figure has been deflated by the rate of inflation ( $4000 \div 1.09$ ) to arrive at the 1978 estimate \$3,670. Since the exchange rate in 1978 was approximately K.83/US\$1, we will use K3,046 as the 1978 capital cost/student place. Since capital and recurrent costs have been calculated in 1978 prices, they are consistent in time with the benefits and no further adjustments for inflation are necessary.

41. Recurrent costs are in the main borne by governmental agencies. In the case of Malawi, a significant portion of the costs - 20% in the case of government-assisted boarding schools - are borne by private fees for boarding and tuition. Furthermore, the level of government-borne recurrent cost is affected by the supply -- and willingness to utilize -- external support (see Tables 5 and 6). The annual recurrent cost to the government for a boarding secondary school student in 1975 was 214K, or less. 1/ This figure does not include the private cost to the student or his family. When calculating the economic returns we will adjust this 1975 figure by a 9%/year inflation rate. Thus for 1978 we will consider the recurrent cost to be 278K/student.

42. Direct and Indirect Private Costs. Tuition in a government secondary school in 1978 prices was approximately 26K/year; boarding approximately 40K/year. 2/ Boarding fees are not in their entirety a legitimate cost - for students would have to live whether they continued in school or not, and it is in no way clear whether the cost of boarding and lodging is higher or lower than what they were to spend as employees. To be conservative we will consider boarding costs to be 25% higher and will add 10K/year to the cost of tuition. Thus the direct private cost in 1978 prices is 36K/year. Indirect (opportunity) costs are not as easy to establish. Male earnings in 1978, two years after

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1/ Previous estimates of recurrent costs in Malawi ranged from 114K to 265K/student in 1975 prices. But these figures erroneously included private costs for boarding and tuition as costs borne by the government. The proportion of the total secondary school operating expenses derived from private fees differs for each category of secondary school, but it ranges from 20 to 40 percent. Earlier estimates of recurrent expenditures in Malawi were overstated by between 20 and 40%. In the case of government boarding schools, students paid 50K/year, and earlier recurrent costs were overestimated by 19 percent; thus we estimate the annual unit recurrent cost in 1975 for government boarding schools as being 214K rather than 265K.

2/ In 1975 prices these were 20K and 30K respectively.

secondary school, averaged K 28.5/month for those who were working. But the chance of not finding productive employment after JC was not inconsiderable and after this unemployment chance is taken into account the earnings of the average JC leaver was K 17.1/month. Since risk of unemployment is a reality for those who leave secondary school after two years however, this is the figure we will use as the opportunity cost for choosing to continue in years III and IV. Thus the opportunity cost is K 17.1/month (K 205/year). 1/

#### The Productivity of Secondary School Leavers

43. The data on productivity (para 36) are derived from a survey of self-reported earnings one and two years after leaving full time schooling. 2/ The first question to be asked is whether, in the Malawian economic context, earnings are a fair proxy for productivity. There has been much discussion of this issue, both generally and about Malawi in particular. First the general issue: Some feel that in economies where a large portion of the salaried labor force is employed in the public sector, differences in earnings have accrued because of an inherited wage structure, and do not represent a difference in marginal value. In part their reasoning is simply conjecture. The theory does not explain why education appears to be a good predictor of advancement in earnings after employment has been obtained (Psacharopoulos, 1980b); and it runs counter to recent evidence on the productivity of the civil

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1/ Probably the most common source of problems in educational economic rate of return in low income countries is to over-estimate the level of opportunity cost (Berry, 1980:38); that is true of these estimates as well.

2/ Earnings are not the same as salaries for earnings. They include all those who are farming or who have incomes in addition to salaries.

service including data from centrally planned economies (Phelps-Brown, 1977). 1/ That there is less than a purely competitive wage market is a fact. But one might ask whether there is any milieu in which an economic return is based upon a pure competitive market. In many countries there are serious distortions in price indicators; farmers may be subsidized (or penalized); "infant" industries may be protected; import substitution policies may work in favor of one or another industry as long as specific regulatory statutes are in effect. The fact is that all estimates of economic returns are subject to distortions of significant proportions; and this is no less and no more true of education. If economic rates of return calculations are not taken into account when planning for educational investments, then perhaps for the same reasons, similar figures for other investments should be ignored when those figures include "distorted" (as opposed to ideal) prices (Blaug, 1969: 12-15). 2/ Weaknesses do exist in the calculation of education as well as other economic rates of return, but multi-sector planning must employ these (and other) techniques for development planning if it is to be consistent and rational. In Malawi in particular: The level of wages and salaries in the public sector cannot be assumed to be entirely a function of colonial inheritance. 3/ Not

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- 1/ The point here is that public sector earnings are complex. Incentives differ between one country and the next, over time, between ministries, and among levels. There are a myriad differing kinds of earnings and functions within public sectors, and it would be less than fair were one to blanketly assume that earnings in the public sector were lower than an individual's productivity.
- 2/ "Distorted" prices include all those characteristics which make actual prices diverge from the ideal: subsidies, taxes, quantitative restrictions on supply or demand, and the like.
- 3/ The commonly heard argument is that wage structures are inherited and therefore are deficient. This argument assumes either that the pre-independence wage structure did not reflect differences in marginal value or when Africanization occurred, somehow there was markedly fewer distinctions in African skills, i.e.: that something was lost in the transition.

only are public sector salaries adjusted periodically; more importantly, the adjustments historically have attempted to keep public sector wages in line with those in the private sector. Adjustments have also differentiated between classes of employees. At the time of the last adjustment in 1978 for example, salaries of the unskilled levels (who were clearly underpaid vis-a-vis the cost of living) were raised by 50%; salaries at the middle (clerical) levels by 32%; and salaries at the technical, professional and special skill level (e.g. nurses) were raised between 32% and 96%. This corresponded to the relative supply of talent at those levels in the economy and the government's ability to attract them from the private sector. Despite the relatively higher weight given to the higher salary levels however, the government continues to find it difficult to attract and to retain qualified personnel.

44. Since the data emanate from a secondary school tracer study and not a cross-sectional household survey, it is not possible to compare the full range of educational investment options--primary, secondary, post-secondary, vocational and the like. 1/ Annual productivity for an investment in years III and IV of secondary school can be calculated, however, in the following manner:

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1/ One issue of universal concern in any survey research is the level of non-response. The uneasiness vis-a-vis a non-response rate of any size stems from the understandable suspicion that those who do not respond may not be representative; that they may be those who are disproportionately unemployed, who shift addresses frequently and who are not necessarily enthusiastic about revealing where they are and how they are doing. But the non-response rate in this particular sample is small (22%), and there is reason to question whether knowing their earnings would have altered the results one way or the other. A bias in the results could only be suspected if characteristics commonly associated with lower earnings were more prevalent among non-respondents than the rest of the sample; but this does not appear to be the case. In fact, non-respondents had a higher level of parental education than the rest of the sample (8.9 vs 8.3 on a 30 point scale). Exactly the same portion of non-respondents were female; attended boarding schools; and passed their examinations. In sum there is no reason to suspect that the productivity of the non-respondents would have been lower than that typical for the sample as a whole.

AP = 12 months x alpha x (MCE - JCE)

where: MCE = the monthly earnings of those who have had four years of secondary education;

JCE = the monthly earnings of those who have had two years of secondary education;

Alpha = that portion of the earning differential due to schooling and not to ascriptive characteristics -- parental economic status, I.Q. and the like. The size of this coefficient (usually .60 - .80 for industrial countries) will be a matter of some discussion.

45. We have essentially two issues to decide by means of judgement when estimating the internal rates of return: (i) the proportion of the benefits due solely to education (the alpha coefficient); and (ii) the stability of net benefits over time.

#### Use of the Alpha Coefficient in Low-Income Countries

46. The size of the "alpha coefficient" does not have a firm scientific birthright. To an observer of earning functions--particularly in industrialized societies--it is evident that factors other than education have a substantial influence. But the rationale for choosing to characterize earning differentials as only 60% or 80% due to schooling is not at all clear. Regardless of how this range came to be accepted however, if accurate for United Kingdom, Western Europe or North America, then it is a significant under-estimate for Malawi. The reason why will be the subject of discussion in the next section on "Meritocracy"; but in sum, sex and socio-economic status appear to have only a fraction of the predictive power on earnings in Malawi as they do in a high income country, and therefore the size of the alpha coefficient in Malawi has to be larger than what is considered the norm elsewhere. In Malawi we will assume alpha to be 90%, though in fact 90% may be an under-estimate for this

particular sample. The effect of this .90 alpha coefficient will be to deflate the estimate of the marginal difference between the two earning streams (MCE and JCE) from K 278/year to K 250/year.

47. The basic equation for calculating the economic returns for investment in education can be taken from Psacharopoulos (1973:27), and appears as follows:

Social Rate of Return <sup>1/</sup>

$$R_s = \frac{\text{discount (constant annual earnings differential)}}{2 \text{ years (opportunity cost + Recurrent cost + Annual Capital cost)}}$$

$$R_s = \frac{.90 (278)}{2 (205 + 278 + 102)} = 21\%$$

Private Rate of Return

$$R_p = \frac{\text{discount (constant annual earning differential - taxation differential)}}{2 \text{ years (opportunity cost + direct cost)}}$$

$$R_p = \frac{.90 (278 - 9.25)}{2 (205 + 36)} = 50\%$$

48. These calculations are based upon an assumption that the level of unemployment ( ) will remain constant over a working lifetime. In fact, however, unemployment tends to be concentrated among the young and to decline thereafter. Since this sample is drawn from those who have been in the labor market for only two years it may be that the rate of unemployment is over-estimated, at least for their working lifetime. Another alternative is to assume that unemployment over one's lifetime would be approximately zero, and

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<sup>1/</sup> The Annual Capital Cost is acquired by taking the cost/student place (3046) and dividing by 30 years, the average lifetime of a secondary school building. The taxation differential for each earning stream amounted to approximately three percent of the income - K 5.75/year and K15.0/year. Thus K9.25 is taken as the taxation differential in the calculation of private returns.



to not correct for a level of unemployment observed among the young. In this particular case unemployment is more highly associated with being a JCE leaver; and not correcting for lifetime unemployment tends to lessen the earning differential between JCE and MCE. 1/ Whichever assumption is the more correct is not at issue. The point is that by assuming first one and then the other, what is generated is a low and a high estimate for the economic rate of return to upper secondary education. This range would appear to be the following:

ECONOMIC RATES OF RETURN FOR INVESTMENT IN  
UPPER SECONDARY EDUCATION (4 YEARS VS 2) a/

	<u>Social</u> (%)	<u>Private</u> (%)
Unemployment = constant	21	50
Unemployment = zero	14	31

a/ Assumes that the difference in earnings between four and two years is constant over a working lifetime; alpha = .90; no corrections for differences in mortality, if any; figures are deflated for unemployment in the case of opportunity costs; in the top column the rate of unemployment is assumed to be constant over a working lifetime and in the lower column it is assumed to drop to zero %. Rates of return cannot be calculated for females because no female who passed their JCE in 1976 chose to enter the labor market.

Discussion

49. Investments in secondary education in Eastern Africa have a reputation for generating higher economic rates of return than any other region in the world (Psacharopoulos, 1972). But the data by and large are a decade old or more (Smyth and Bennett, 1967; Thias and Carnoy, 1969), and since secondary school systems have doubled, tripled or, in case of Malawi, even quadrupled enrollments in the interim, a question might be raised as to whether estimates

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1/ If = constant: the Annual Earnings Differential = 250 (social) and 242 (private); if = 0; the differential is lessened to 158 and 150 respectively.

of productivity would be as high for the 1980's as they were in the 1960's. These data - despite their admitted shortcomings - would indicate that estimates made a decade ago for Kenya (23%) and Uganda (29%) are not inconsistent with the results from Malawi. 1/ However much growth has occurred in secondary education since the 1960's, it appears that the demand for and productivity from the graduates is in significant excess of the capital and recurrent social costs of educating them. These returns essentially reinforce what we know about the scarcity of educated human capital from cross-sectional manpower surveys, 2/ historical projections over time, and simple common sense. 50.

The fact that the unemployment rate is so low - .7% for males who pass their MCE examinations - illustrates the degree of scarcity of what, in industrialized countries, is both universal and mandatory basic education. Malawi is only now beginning to develop an educational system of sufficient size and quality so that its labor force, in terms of skills, would be internationally competitive. Despite significant expansion, today the same proportion of the population attends secondary school as attends Ph.D. programs in North America. Ten years ago this comparison might have seemed out of place. But there is, on all sides, an increasing awareness that the skill level required for agricultural and commercial efficiency in Europe, North America and elsewhere is the same which is required - but can't be afforded - in Malawi. Today students with two years of secondary school are asked to make

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1/ It must be remembered that these earlier returns were calculated on the basis of four (or even six) years of secondary school vs 0 years of secondary school. The returns on Malawi are for four vs two years of secondary school. If data were available for 4 years vs 0 years, the returns would be substantially higher.

2/ One recently-conducted survey on the demand for engineers in Malawi concluded with the following statement: "A review of the projected situation to 1988 clearly indicates that Malawi need not worry in this century about an over supply of engineers." See: Engineering Manpower Survey of Malawi (East Orange, New Jersey: Louis Berger International, January, 1979), pp. IV-6.

professional decisions in medicine, agriculture and other sectors, decisions which would be restricted to individuals with post-secondary training in other environments. The difference is not one of "manpower requirements"; the complexities of medicine and agricultural inputs do not vary when one crosses from one country to the next. Instead the reason that junior certificate level preparation is allowed as the pre-requisite for entering many professional training programs is because individuals with higher levels of basic education are simply too scarce. This scarcity has a cost. In the case of agriculture and commerce the cost is in economic efficiency and productivity; in the case of medicine and education the cost is even more serious.

51. Of course, one additional side-effect of fixing manpower coefficients at levels well below that of developed countries - as with medical assistants with only two years of secondary school for example - is the cost incurred by training institutions which are required to teach basic science and language which should have been learned in general education. It is four times more expensive to teach calculus, science, or English at Mikolongwe or Colby than it is at a secondary school for example; and nine times more expensive at the Polytechnic than at a secondary school. Yet post-secondary training institutions such as these have to allocate sizable portions of time and resources to remedial work. 1/ Even more serious perhaps is the comparative disadvantage and diminished (constrained) productivity of a society whose professionals in such fields as agriculture and industry are few in number, and whose knowledge of science and other basic subjects is a fraction, perhaps a small fraction,

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1/ According to the engineering manpower survey: "members of industry [commented on] the poor quality of student output from some of the secondary schools. Because of this shortcoming, the Polytechnic has had to include a considerable amount of remedial work in the courses given during the first academic year. The problems in the secondary schools center around the quality of teaching, day schools versus boarding schools; and the lack of advanced courses in mathematics and the physical science ..." See: Engineering Manpower Survey of Malawi (p. IV-20).

of what is commonly available in a labor force in other countries with whom Malawi must eventually compete economically.

52. Exactly how expansion affects the social economic rates of return is not well known. Nevertheless despite a rapid rate of expansion, Malawi still has one of the world's lowest secondary school enrollment ratios (3% of the age group). There is, therefore, no reason to suspect that continuing the increase in enrollment that prevailed between 1963 and 1978 (10%/year) would significantly reduce the economic rates of return. Furthermore, in our judgment serious steps should be taken by both external and internal agencies to maintain the level of secondary educational expansion as long as the rates of return to the investment remain economic.

#### EDUCATION AND MERITOCRACY: THE EVIDENCE FROM MALAWI

##### Background

53. Both economists and sociologists of education are currently engaged in a debate over the degree to which education--and educational investment--acts to maintain social and economic inequality. To be sure the epicenter for a storm of this nature is centered well away from Malawi; nevertheless the discussions have seriously influenced professional thinking in the field of education in universities, governments, and development institutions of many kinds--both bilateral and multilateral. Since a Basic Economic Report attempts to synthesize a broad array of topics that pertain to economic development, this may be an appropriate place to raise the issue of education and inequalities and to discuss its relevance in the Malawian economic context.

54. Three common pieces of evidence are used to indicate whether educational institutions are used to maintain differences in family wealth across generations. The first is the degree to which schools are used disproportionately

by children from comparatively advantaged family backgrounds; the second is the degree to which these same children tend to perform better in schools; and last is the degree to which family background and non-meritocratic criteria (as opposed to educational achievement) determine later earnings. 1/ It is argued that each of these tendencies appears to be true of the industrialized societies, 2/ that is, children from comparatively well-off family backgrounds tend to perform better in school, stay longer in school, and use criteria other than achievement--such as family influence--to obtain higher earnings. 3/

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Two implications that have emerged from this line of reasoning and from this literature deserve mention here. One is that societies characterized by these findings--particularly the finding that academic achievement is not the principal determinant of labor market success--these societies are said to select on the basis of ascription rather than merit. 4/ And secondly, from

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1/ There are, at least, two divergent views about what the concept of "merit" means (Olneck and Crouse, 1979). One side argues that merit is the product of individual effort and initiative (Brittain, 1977; Klappholz, 1972; Bell, 1977). Others believe that merit is not evidenced necessarily by individual application and attitude; rather it is the product of technical and cognitive ability (Herrnstein, 1971). The latter view runs into numerous conceptual complexities when distinguishing between the technical or cognitive ability which is inherited from the technical or cognitive ability which is learned. Both views of merit readily have to admit that the distribution of the commodity--however defined--is related to differences in socio-economic origins. It is this assumed connection between merit and socio-economic origins which we intend to explore in the case of Malawi.

2/ Japan is a major exception (Cummings, 1977).

3/ See for example: Sewell et. al., 1976; Sewell and Hauser, 1974; Sexton, 1971; Jencks et. al., 1972; 1979; and Persell, 1977 among others.

4/ Findings from the U.K. suggest however that academic achievement is a stronger determinant of earnings than it is in the U.S. (Psacharopoulos, 1977). Findings from the Netherlands suggest similar differences (Dronkers and de Jong, 1979).

these observations some people have drawn the inference that public agencies should not invest in furthering education. This latter conclusion has very serious implications for educational development in nations where education is a scarce resource, and where the spread and quality of schooling is well behind industrialized countries. Though phrased in the extreme perhaps--to not invest in furthering education--it is only fair to the point out that this reasoning about inequality has previously helped to determine attitudes toward formal schooling in low-income countries. Early justifications for "non-formal" education were made on the belief that it would be more beneficial to the poor; as would "rural education"; or a "practical curriculum" (Botti et. al., 1978; Coombs and Ahmed, 1974:19). And significant investments have been made by external agencies on the basis of this belief. The problem is not that these investments are uneconomic--some are and some are not; the problem is that in part they have been based on an unverified and dubious assumption that in countries like Malawi formal education is used to maintain differences in family wealth across generations.

56. In Malawi we do not have much evidence pertaining to the first of the inequality propositions--that of disproportional use of educational facilities by the more economically privileged. But in no country--whether socialist or capitalist, high or low income--are select educational institutions (or roads for that matter) utilized in ratios exactly proportional to the socio-economic make-up of the general population; 1/ and Malawi is no

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1/ To determine the degree of socio-economic over or underrepresentation one must be able to disentangle the influences of two characteristics of the comparison population which could bias the results: geographical access to lower level schooling, and age of parents. For example, the parental education of the in-school population should be compared to the education of the adult population in the age group most likely to have children of secondary school age eg: (30-50), and who come from the same geographical area as that of the secondary school students in question.

exception to this rule. On the other hand, if one were to take the most educated parent of each Malawian secondary school student, one would find that about half never entered or finished primary school. Of the male students at the MCE level 83%, by being at that level, had already obtained more education than either of their parents. On balance the proportion of students from humble homes is not at all inconsiderable (about 50%). 1/ Previous research conducted on this same issue would suggest, moreover, that the degree of educational "openness" that characterizes Malawi is consistent with that found in other African countries (Anderson et. al., 1969; Currie, 1974; Foster, 1965). 2/ As a comparison, it would be interesting to see how these rates of selectivity would compare with the selectivity of school populations in Western Europe or in the United Kingdom at a point in time when a similarly small percentage (3%) of the age cohort attended secondary school. We tend to concur with Foster who, with respect to Ghana, has argued that "such wide recruitment probably did not prevail at earlier stages of European economic development... (Foster, 1965: 246).

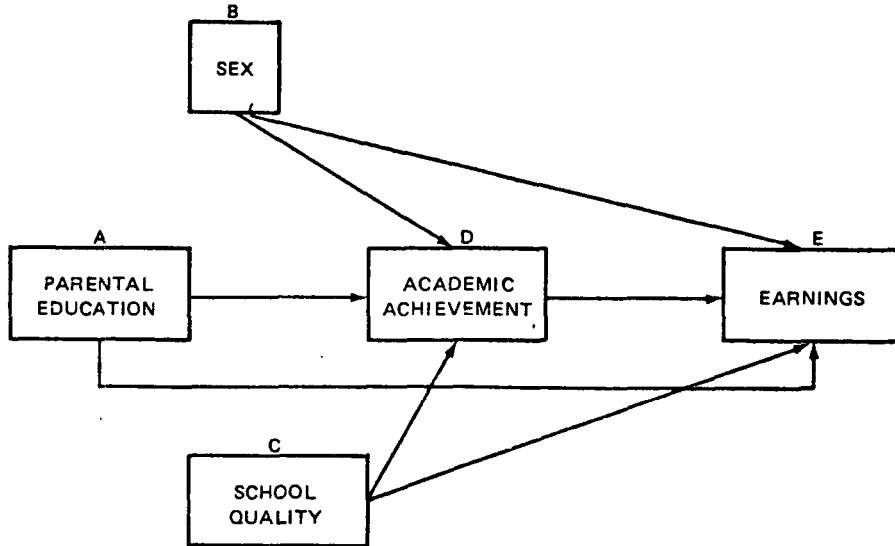
57. The more substantive evidence available from Malawi pertains to the second and third of the inequality propositions--the influence of family background on examination performance and on later earnings. The basic proposition is that the higher the degree of influence of family background and other ascriptive criteria on either achievement in school or on later earnings - the less meritocratic the process of selection. This can be expressed in the following model:

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1/ Taking the most educated of the parents: 51.4% had less than 8 years of schooling; 31.3% had between 8-12 years; 16.8% had 13 years or more.

2/ The term "open" refers to the degree of under representation of any particular sub-group--class, race, sex, etc.

FIGURE 1  
BASIC MODEL FOR ESTIMATING THE DEGREE  
OF MERITOCRACY IN THE ECONOMY



In this model, "meritocracy" is a state in which rewards are not distributed primarily on the basis of ascribed characteristics such as parental education or sex (A or B). Instead it is a state in which the influence of School Quality (C) and Academic Achievement (D) on Earnings (E) is greater than the influence of A and B on E. We will discuss the evidence from Malawi by presenting the impact of each separate determinant of academic achievement and of earnings; then we will draw some conclusions as to the relative impact of C and D versus A and B, in Malawi and in high income countries. But on the strength of the available evidence however, we will argue that schools



in Malawi act to make up for (instead of transfer) differences in socio-economic background across generations, and that the economy is highly meritocratic in the manner by which it distributes rewards in the form of earnings.

The Determinants of Academic Achievement and Later Earnings

Educational Attainment and Earnings

58. One additional year of secondary school for an American student will be associated with an increase in income of about 5% (Jencks et. al., 1972). One additional year of secondary schooling for a Malawian student will be associated with an increase in income of about 68 percent. 1/ In the Malawian economy schooling is the single most effective predictor of earnings, whether in gross terms [ $r = .26$  ( $p < .001$ )] or in net terms [ $Beta = .45$  ( $F = 69.6$ )]. 2/ The influence of educational attainment is larger

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1/ The average JCE in the labour market earns 17.1 K/month; the average MCE earns 40.4 K/month. Both of these have been deflated by the portion of the sample who were unemployed.

2/  $r$  - a zero-order correlation - is a measure of the simple association of the change in one variable with that of another, positively - as in the case of rainfall and the growth of flowers, or negatively - as in the case of temperature and the growth of flowers.  $b$  - an unstandardized regression coefficient - is a measure of the amount of net (holding the influence of other variables constant) change in one variable which can be expected from a change of one unit in another variable. It is "unstandardized" because not all variables have the same variance - e.g. sex has a variance of one; mother's education has a variance of greater than one. Thus the  $b$  for mother's education on achievement cannot be easily compared with the  $b$  for sex and achievement. Beta - a standardized regression coefficient - is the amount of change in one variable which is associated with the change in another variable holding other influences in the equation constant and after being "standardized" for differences in variance and in means.  $F$  and  $p$  are measures of statistical significance.  $P < .01$  implies that that probability that a coefficient could have occurred by chance is one in a hundred. For further details see Blalock (1960).

and statistically more significant than any other determinant of earnings on which information exists (Tables 20 and 21). 1/

School Quality, Achievement, and Earnings

59. The importance of educational quality, at least as measured by the economic value of school physical facilities, is a matter of some debate in the United States and other industrialized societies. But the debate itself is over whether school quality has no significant impact or whether it has some significant impact. Whether the influence of school quality is paramount does not arise, for the data consistently indicate, by comparison to family background for example, that it is not paramount. School quality accounts for only 13 percent of the explained variance in academic achievement in England or the United States (Heyneman, 1976), 2/ and for no appreciable variance in later income (Jencks, 1979: 295). From previous research in low income countries however, the impact of school quality on academic achievement has been found to be three or four times what it is in high income countries. In Uganda, for example the quality of primary schools is responsible for

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1/ In this discussion we will be describing the results of two basic regressions, one with academic achievement as a dependent variable and a second with earnings as a dependent variable. In the former the independent variables consist of parental education, sex, and school quality; in the latter the independent variables consist of parental education, sex, school quality, and academic achievement.

2/ The proportion of explained variance is the percent (of the variance which can be explained) which is attributable to one or another variable. If the total variance explained ( $R^2$ ) is 50%, and 25% is explained by variable X and 25% by variable Y, then variable X can be said to account for one-half of the explained variance and variable Y for one-half of the explained variance. Describing the impact of a variable in this way allows for the comparison between different studies which, while considering similar variables, explain different levels of the total variance (Heyneman, 1976: 208).

approximately one-third of the explained variance in primary school achievement. Moreover, Currie (1977) has shown that the academic quality of a Ugandan secondary school has many times the impact of parental occupation on occupational attainment ( $r = .16$  vs.  $.05$ ). 1/

60. In Malawi the only indicator of school quality we have available is a 0/1 variable which distinguishes a boarding from a day secondary school. 2/ Nevertheless this indicator is the strongest influence on examination performance [ $\text{Beta} = -.39$  ( $p < .01$ )] (Table 19); and the third strongest determinant of earnings in the labor market [ $\text{Beta} = -.09$  ( $p < .05$ )] (Table 20).

#### Sex, Achievement, and Earnings

61. Higher academic performance by males is a feature common to both high and low income countries. The degree of the influence differs by subject, and occasionally by level of education. In Malawi sex affects examination performance, but is not a major determinant. The zero-order relationship ( $r = .01$ ) is virtually zero; 3/ though a strong partial correlation does emerge in regressions that include (control for) boarding or day school, and parental education [ $\text{Beta} = -.34$  ( $F = 55.1$ )] (Table 19).

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1/ The main impact (path coefficient) of secondary school quality in Uganda is expressed indirectly through its effect on a student's academic performance.

2/ The difference between a boarding and a day secondary school is more than boarding facilities. The former tend to be endowed with better teacher and facilities of many kinds, and higher costs. Moreover, as a matter of policy, the Government places students with the highest scores on the Primary School Leavers Examination in boarding schools and then allocates the remainder to day schools until all places are used up. Hence part of the relationship between type of school and examination performance noted in the text may be due to student selection rather than to school quality.

3/  $r = .01$  is the correlation for the sample as a whole ( $N = 930$ ); the correlation in Table 18 of the same two variables ( $r = .12$ ) is of that portion of the sample which did not continue their studies.

62. With respect to earnings, most studies exclude women respondents as a means of statistical control, a practice severely criticized by Patterson (1973). Levitan *et. al.*, one of the few exceptions, find that on the average American women receive 71 percent less income than do men with the same scores on academic ability variables (Levitan *et. al.*, 1971, p. 252). <sup>1/</sup> In Malawi the situation is very different. Sex is only moderately associated with earnings ( $r = -.12$ ) (Table 18); but this difference disappears almost entirely after controls are placed upon examination performance and educational attainment (Table 20). Sex is associated with a three percent difference in earnings among MCE graduates who fail their examinations--with females earning more--and a ten percent difference among MCE graduates who pass their examinations--with males earning more. Sex (Beta = .02) accounts for less than one percent of the explained variance in earnings and is not statistically significant.

#### Academic Achievement and Earnings

63. Most studies from the United States do not analyze grades or examination performance in great detail; instead they concentrate upon academic "ability". Results from studies using school grades as measurements have an even more obscure connection to earnings. Regardless of which measure is used however, most studies find that if academically talented males do not acquire more schooling they will not earn more than males with less academic

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<sup>1/</sup> The occupational status of men and women in the U.S. is largely determined by their educational attainment; however, women in the same occupation earn significantly less than do men. Thus a sizeable portion of the difference in earnings is associated with being male. See: Abrams *et. al.* (1977). This is also true of the Soviet Union. See: Swafford (1978).

ability (Jencks et. al., 1979). 1/ Results from Malawi stand in stark contrast to this. Males who pass an examination at the MCE level will, on an average, earn 51 percent more than those who fail. Examination performance is very highly correlated with earnings [ $r = .24$  ( $p < .001$ )] (Table 18); and in a regression, the net effect of passing an examination (either JCE or MCE) will account for 56 percent of the explained variance.

Family Background, Achievement, and Earnings

64. In the United States and other industrialized societies, a typical correlation between father's education or mother's education and examination performance of the children is about  $r = .26$  (Jencks, 1979); and between these two background variables and earnings about  $r = .16$ . 2/ But Malawi is typical, not of a society which is stratified industrially like the United States; instead it is typical of a society just commencing the process of industrial stratification. Consequently the pattern of interaction between family background and later achievement is typical of a society at an early stage of industrial stratification (Heyneman and Currie, 1979). 3/ The relationships, for example, between parental education and either academic performance

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1/ This is true up to the age of 30; over age 30 academic "ability", holding educational level constant, does make a difference. This suggests three things: (a) the more "able" invest more in themselves via choices of learning on the job; (b) they and others learn progressively more about their capabilities; and (c) they have more chances to learn and earn.

2/ The United States is being used here only as a reference example of an industrialized society. Actually, the father-to-son occupational inheritance is considerably more open in the United States than it is in Poland. See Meyer, et. al. (1979).

3/ In Uganda family background consisted of a combination of parental occupational status and parental education; in Malawi the measure consisted of the number of years of education of the most educated parent.

[ $r = -.09$ ] or earnings [ $r = -.04$ ] are virtually nil (Table 18). <sup>1/</sup> This at first surprising lack of a relationship is confirmed when, in a multiple regression, with the intervening factors of sex and school quality are held constant [ $\text{Beta} = .13$  and  $.03$  respectively] (Table 19 and 20).

65. After reading these findings the first question one might ask is whether the nil correlations could be attributed to a lack of variance in social status? We think not. If a lack of variance were the explanation, then high status children would be more likely to perform better on their examinations--thus implying that the effect of their higher performance had been attenuated (in the measure of central tendency) by the relatively small portion of the population located in the high status categories. But this is not the case. In fact at both the JCE and MCE levels, students whose most educated parent never finished primary school performed (slightly) better in math and science than students with a parent who had attended university or other post-secondary training (Table 21). This divergence from what is normally expected in the relationship between these two characteristics might best be illustrated by Figures 2 and 3. Here the average mathematics scores at both JCE and MCE levels are plotted against the years of schooling of the most educated parent. Normally one would expect the existence of a more or less straight line pointing to the diagonal--with scores rising with parental education. In Malawi, however, this simply does not appear to be the case. On the JCE for example, students whose parents had zero years of schooling performed better than students whose parents had attained 14, 15, 16 or even

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<sup>1/</sup> No relationship emerges whether one uses the full sample ( $N = 930$ ) or the labor market sample ( $N = 310$ ). Nor does any relationship emerge between parental occupation and examination performance - with either sample.

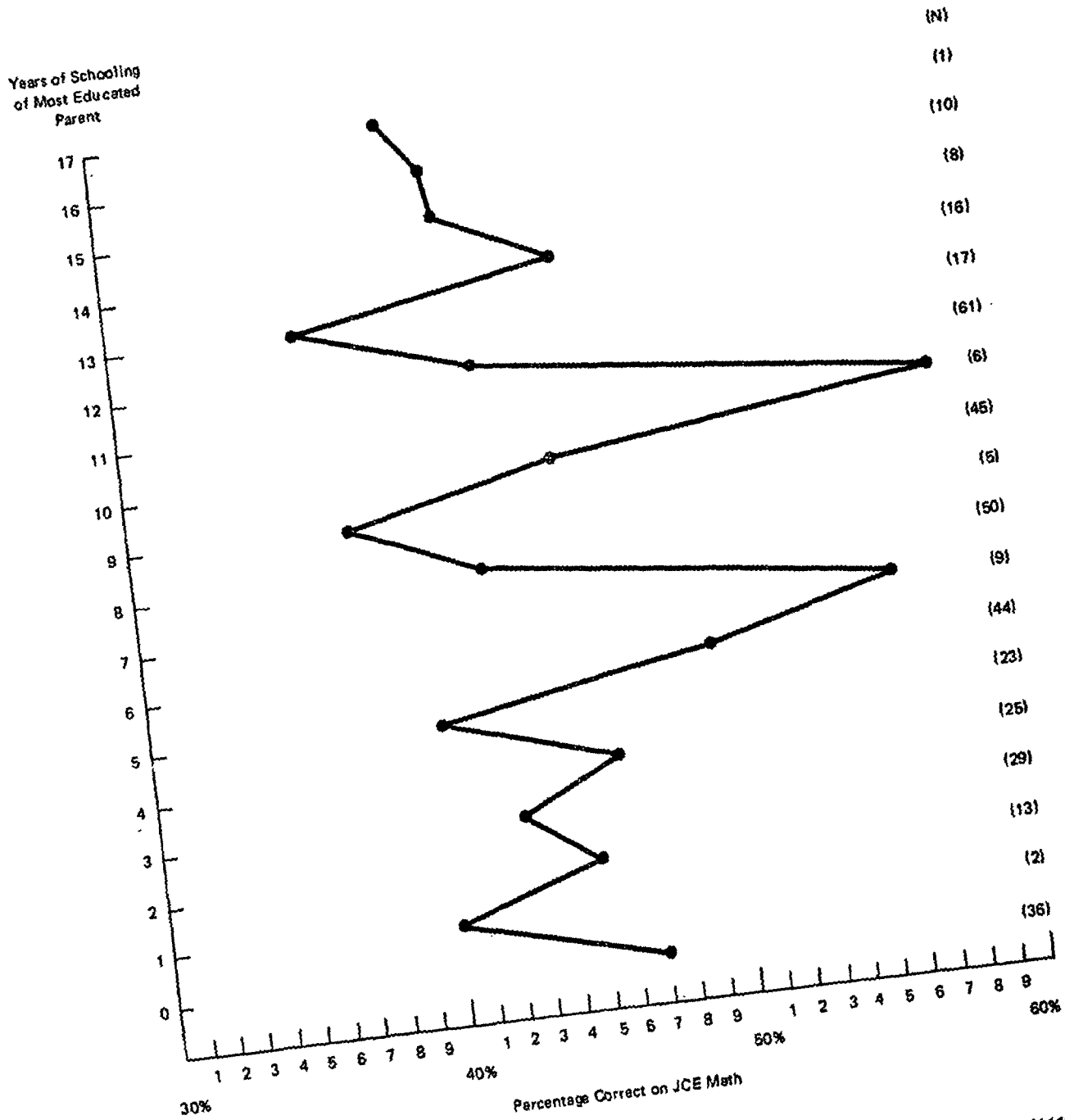
17 years of schooling. Similar complexities occur in the case of MCE students whose parent had attained either two or seven years of schooling. 1/ Table 21 and Figures 2 and 3, simply put, show that secondary school students from high status families are no more likely to pass an examination, and that these nil correlations cannot be attributed to a lack of variance.

66. There are now nine studies from lesser-industrialized societies which have concluded that wealthy children do not perform better in schools: three from Uganda; three from Kenya, one (among Africans) from Zimbabwe, one from Ghana, one from Papua-New Guinea, and one from India (Heyneman, 1980b). In addition, from evaluations of education projects assisted by the World Bank exist two more: one from Somalia, one from Kenya. Three theories have emerged as a means of explanation. One of them concerns the transferability of family background influences through language. On the basis of data from India and England, Bulcock, Clifton and Beebe (1977) have concluded that language (not economic resources) is the reason why family background predicts school achievement in industrialized societies. In less industrialized societies, where language is less dependent upon print, the richness in language may not differ as markedly between a wealthy and less wealthy child, and the average difference in school achievement may be less.

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1/ With the MCE the direction of excellence is the reverse of the JCE; that is, the lower the score, the higher the performance.

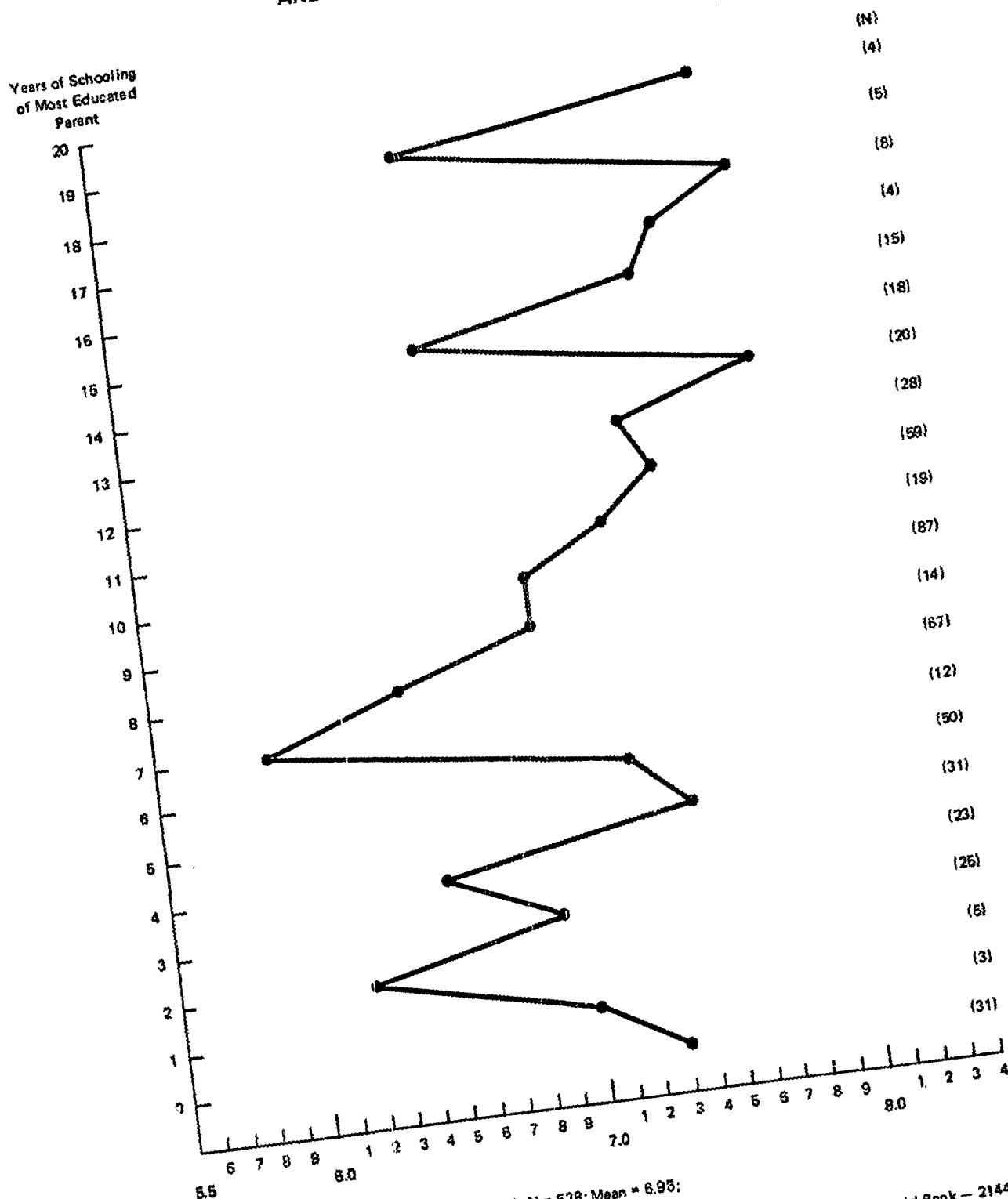
FIGURE 2  
PERFORMANCE ON JCE MATHEMATICS  
AND PARENTAL EDUCATION (1976)<sup>a/</sup>



<sup>a/</sup> N = 400; Mean = 44.3; S.D. = 18.1; r = .07; F = 1.185.



FIGURE 3  
PERFORMANCE ON MCE MATHEMATICS  
AND PARENTAL EDUCATION (1976)<sup>a/</sup>



<sup>a/</sup> Range 1 thru 9 (1 = highest score possible); N = 528; Mean = 6.95;  
S.D. = 4.85; r = .03. F = 1.15.

67. A second theory concerns what are called "process variables". These are attitudinal elements which are consistent between what is expected of a child in the home and what is expected of him in the school--parental demands that students study hard, be cooperative, value education and the like. Kifer (1977) argues that in industrial countries the degree of continuity in these process variables differs significantly between wealthy and impoverished families; but that in low income countries where schooling is scarce--the attitudes and encouragement of parents with respect to school children do not differ between wealthy and impoverished families.

68. A third theory parallels the other two, but chooses to explain these processes in the language of social stratification. The possibility that there are smaller differences in language, in the perceived value of schooling, and in feelings of personal self-confidence--between privileged and impoverished children in low income countries, suggests that it takes time for an economically privileged group within a low income country to evolve into a genuine industrial social class. This time element may take many generations, and until the process has taken effect, the differential performance which characterizes the children of the wealthy in high income countries will not characterize the children of the wealthy in low income countries (Heyneman, 1979a; Heyneman and Currie, 1979b)).

69. The reasons why family economic background, on an average, is not a good predictor of academic achievement--or earnings--will be a subject of debate in the social sciences for the next decade. The important point here is that first, these findings from Malawi appear to be roughly consistent with those of other countries at a similar state of economic development. 1/

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1/ Bolivia may be an exception. See Kelley, et. al. (1977).

And second, that contrary to the evidence generated from highly industrialized societies which has been used to show that educational investments act to cement existing social inequalities, if applied in Malawi these theories will have to undergo significant moderation.

Summary

70. The sum of these differences between Malawi and the United States are illustrated below in Figures 4 and 5.

FIGURE 4

THE DETERMINANTS OF ACADEMIC ACHIEVEMENT  
IN MALAWI AND IN THE UNITED STATES,  
BY RANK ORDER OF IMPORTANCE

	Malawi	USA
School Quality	1	3
Sex	2	2
Family Socio-Economic Status	3	1

FIGURE 5

THE DETERMINANTS OF EARNINGS IN MALAWI  
AND IN THE UNITED STATES,  
BY RANK ORDER OF IMPORTANCE

	Malawi	USA a/
Years of Schooling	1	2
Academic Achievement	2	4
School Quality	3	5
Sex	4	3
Socio-Economic Status	5	1

a/ Conclusions here are drawn from Jencks et.al. (1972; 1979), except in the case of sex which is based on discussion to be found in Patterson (1973) and Levitan et.al. (1971).

71. In the United States the predominant determinant of academic achievement and of earnings is an individual's family socio-economic status. The influence of sex would rank second, or third. The influence of academic achievement (on earnings) would rank low; and the influence of school quality on either achievement or earnings would rank last.

72. The influence in Malawi of these same variables differs significantly from that which pertains in the United States. The strongest determinant of academic achievement is the quality of the school. The predominant influence on earnings is years of schooling and very close to its influence is academic achievement. 1/ Third in influence is school quality; fourth would be sex. Family socio-economic status in Malawi is the least powerful determinant of either academic achievement or earnings.

73. These data are far from sufficient however. They only include individuals who have attended secondary schools, a very small portion of the population; and they have followed individuals for only two years into the labor force. Thus they are indicative of the secondary school population who have acquired their first, or at the most, their second jobs. Furthermore there is nothing in these data which would indicate that the situation in

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1/ Papanicolaou and Psacharopoulos (1979) argue that educational attainment is more able to determine earnings of the lower classes in the United Kingdom. Education, they say, may not significantly increase the earning chances of sons from wealthy families "since they will get good jobs anyway". One key distinction between an economy characterized by a large private sector and one, like Malawi, characterized by a small private sector, is that in the latter the sons of wealthy families cannot as easily count upon having professional employment without the requisite educational entry criteria. In Malawi the only way to obtain the requisite entry criteria is through open competition on an academic examination graded by computer; and since the sons of wealthy families are not likely to perform any better on these examinations than are sons of impoverished families, the rich in Malawi, unlike the UK, cannot count upon maintaining their social status across generations.

Malawi is stable; it may in fact be the case that as industrial and agricultural occupations become more diversified, the determinants of earnings may shift away from current tendencies and become more parallel to the determinants which pertain in high-income countries. Only time--and more complete data--will tell whether this will occur. The key to the process for selecting talent in Malawi--as in other lesser industrialized societies--is (i) the equality of opportunity to attend school, 1/ and (ii) the equality of opportunity to remain in school. The former is based on the propensity of governmental authorities to insure the equitable spread of new investments in primary and secondary school facilities. Since independence a significant amount of attention has been paid to this issue and there is no evidence which would suggest that judicious attention to this issue will not continue in the future. The latter depends upon the tendency of students from family backgrounds of relative poverty to perform as well on selection examinations as students from family backgrounds of relative privilege. At present this pertains. In fact, this may be the single most important distinction between the process of social selection in Malawi and that of a high-income country; in Malawi there is, at present, no evidence that students from more advantaged

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1/ Because only a tiny portion of the students who begin grade one ever reach secondary school, some might suggest that this is evidence that the system is inequitable. Indeed it is inequitable if one defines "inequality" as unequal attainments. Choices have to be made and some who might wish to continue cannot. But in no country is the structure of education square; in all countries educational participation is shaped like a pyramid. Inequality of utilization, moreover, is not necessarily contradictory to the existence of a meritocracy. On the other hand, an absolutely essential ingredient of a meritocracy is the equality of access. For a discussion of the difference, see: Heyneman, 1977 (IIEP).

social backgrounds perform better on academic selection examinations. <sup>1/</sup>  
The economy of Malawi is indeed one characterized by low incomes and poverty relative to most other nations of the world. But on the other hand what opportunity is available, at least for those who have attended secondary school, appears to be genuinely distributed on the basis of merit.

#### SUMMARY

##### Finance

74. Malawi's development in education depends upon a dependable supply of external capital. It is only through external sources that post-primary education has been able to grow to the extent that it has; and if this source were threatened, Malawi's educational prospects would be jeopardized. In our judgement steps should be taken by agencies concerned with the economic prospects in Malawi to insure that this supply of capital is enlarged, made more dependable and utilized for a constant expansion of both primary and post-primary education.

75. In no way does this imply that internal sources of capital should not be found and exploited. Serious inefficiencies exist and unless ameliorated substantial portions of local capital will be ineffectual. In primary education one source of difficulty rests in the way school construction, equipment, books, and supplies are financed; and how school fees are administered. Large portions of the fees never return to the schools

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<sup>1/</sup> In Malawi, cognitive ability supplants family background as a determinant of adult success. This is because success depends upon schooling, and selection for further schooling is determined more than anything else by ability. Nevertheless we would still agree with a larger, more philosophic question raised by Olneck and Crouse (1979: 25). These results do not answer their question as to what comprises "legitimate" cognitive skill or why cognitive skill matters in the achievement process. The answer to these questions remain elusive.

from which they originated. Even if they were, they would not be adequate to significantly raise the level of school achievement. Our recommendations (as stated in para 29) would be that education capital costs be financed under the auspices of the central government; that included within capital costs would be investment in desks, blackboards, maps and books, so that schools could obtain a minimum level of quality; that all school fees be applied to truly recurrent expenditures - maintenance repairs and the like; and that school and parental authorities not be prohibited from raising school financial resources over and above the national norm set by central government, or prevented from allocating those resources for the purpose they see fit.

#### The Level of Investment in Education and Training

76. Malawi entered nationhood with handicaps of many kinds--a scarcity of mineral resources, a primitive transportation network, a system of agriculture based-by and large-on the hoe, and a lack of human capital. Since independence some of these problems have been alleviated, and the conservative prognosis of two decades ago in which it seemed unlikely that the economy of Malawi would be able to employ 20th century tools--machine tools, tractors, telephones and the like--this prognosis was shortsighted.

77. What is evident today is that Malawi in the 1980's and 1990's, like most nations, will depend increasingly upon these tools. The efficiency by which they are utilized, in turn, will depend upon the skill and quality of its labor force. But the level of human capital in Malawi is not yet competitive with other nations. This is so not because investments in human capital appear uneconomic, i.e.: that improvements in school quality don't affect learning, or that school leavers are unproductive. The facts appear very much to the contrary. Despite considerable growth since the 1960's, investments

in education appear very economic indeed: school quality is a very strong determinant of the amount of learning generated by the system, and in contrast to what pertains in high income countries, the amount learned in school is the predominant influence on later economic productivity. School leavers are absorbed into productive activities with a surprising degree of efficiency and profit--both to the individual and to the general society. In sum: human capital in Malawi is uncompetitive not because of a lack of demand, but because of a scarcity in quantitative and qualitative supply.

78. With the exception of the appraisal report to the Third Education Project, previous investigations into the human capital situation in Malawi have, by and large, concentrated on enrollment data. Primary and secondary schools were analyzed in terms of the efficiency with which they processed individuals from one grade to the next and between one level and the next. If the output was in the vicinity of the number of individuals thought to be required in the economy, then the system was thought to be of sufficient size. This exercise for the Basic Economic Report has taught us at least two lessons about previous methods of gathering and interpreting evidence. The first is a sense that manpower projections appear more useful for the estimation of occupation-specific skills--teaching, engineering, electrician-training, agricultural extension and the like--and less relevant for estimating the demand for basic general education. The second has to do with the range of evidence previously available on educational quality--the teacher/pupil ratio, the proportion of "unqualified" teachers, and whether or not the syllabus was "relevant". We need, among other things, to know the level and determinants of academic achievement, the status of student health and nutrition, the sources and efficiency of school finance if we are to judge the adequacy of



investments in educational quality. We make no claim to have adequately explored the ingredients necessary to judge the sufficiency of these investments in Malawi, but it has become clear that the nature of educational quality is substantially more complicated than knowing the teacher/pupil ratio or whether the syllabus was "relevant".

79. Because earlier documents worked from more narrowly defined sources of evidence, 1/ their recommendations diverge slightly from our own. Nevertheless, they are not inconsistent. All along it has been felt that primary education was in need of serious attention in Malawi. But previous efforts had to rely upon impressions to draw any conclusions, and this scarcity of factual evidence on primary education permitted priorities of a comparatively peripheral nature to surface in its place--technical training, practical subjects in secondary schools, commercial education, and the like. In our judgement however, the most critical contribution to be made by human capital investments toward the development prospects of the general economy rests on the coverage and quality of primary schooling. Its coverage should be universal and its quality should be sufficient to increase the level of science, mathematics, reading comprehension and other basic skills up to a point where the labor force--other factors such as diligence held constant--is not at a disadvantage vis-a-vis other areas of the world. This will require long-term planning and long-term commitment of investment resources. As best as we can estimate, this will require the construction and equipping of approximately 460 new primary schools and the reconstruction of an additional

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1/ Again, the appraisal report for the third education project is an exception.

1150 which are currently below even the most minimum standards of quality. 1/  
At the current price of US\$43,000/school this will require the commitment of  
US\$70 million in new resources. 2/ 3/

80. Second priority, without a doubt, is general secondary education. General secondary education is basic education throughout the entire industrialized world, and it would be a serious error in judgement were development agencies to not recognize the inevitable consequences of limiting basic education in a low income country to a level lower than international standards. Planning for secondary education will require a general recognition wherever

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- 1/ There are approximately 2,300 primary schools in Malawi. At least 20% of the age cohort never see the inside of a grade one classroom. Increasing the number of places available by 20% (460 new schools) would be sufficient to cover them. But at least 50 percent (e.g.: 1150 schools), though operating, are below minimum standards. To bring them up to minimum standards and to cover the remaining out-of-school population will therefore require an investment in about 1,610 new or renovated schools (13,000 classrooms). The cost in 1978 prices would be approximately US\$70 million.
- 2/ K36,000/8 room school unit includes local construction and labor at 40 k/sq. meter; it also includes furniture and all equipment necessary to establish a school of minimal quality at late 1978 prices. The cost figures do not include textbooks, chalk, pencils, exercise books or teacher training.
- 3/ Since recurrent costs have been carefully calculated within the rate of return figures, the fiscal implications of expanding secondary education--at 10%/year--have been taken into account. If the immediate past (1976-1979) on which these data are based, is similar to the immediate future, then the level of fiscal revenue (productivity) to be derived to the society would be well above the recurrent costs for expanding secondary education. This optimistic view, again, broadly parallels the most recent conclusions based upon manpower estimates. See: Shields (1980). However, the level of secondary school expansion depends to some extent upon the level of private financing. Currently this level is sizeable--20% or more of secondary school recurrent costs. But the sharp difference between the social and private economic returns to secondary school education--private returns are more than double--would suggest that at the very least, the level of private financing should remain constant. This means that as recurrent costs increase, so too should school fees on a parallel basis.

it is discussed in economic circles that the nature of general secondary education implies neither high level intellectual skills, nor specialized skills. Though today Malawi is impoverished, it requires only a moderate amount of vision to recognize that in the not too distant future it will require universal secondary education as it now requires universal primary education. The question, therefore, is not whether, but how fast to proceed. Planning for the expansion of general secondary education will require a balance between private demand and public finance. In this regard, close attention should be paid to the use of evidence in addition to manpower estimates. Since independence, secondary school expansion has continued to generate more than adequate economic returns, and unless new evidence emerges to the contrary, future expansion over the next two decades should probably proceed at a similar rate--approximately 10 percent/year. This would imply an increase of 1,500 student places (three schools) and capital investment (in 1978 prices) of US\$6 million in year one; and a total investment program between 1978 and the year 2000 of approximately US\$432.4 million, again, at 1978 prices. If the returns to educational investments remain as consistent in the future as they have in the past, then in the year 2000 Malawi should have approximately 123,000 available places in secondary schools. This "ideal" program is prevented however not by a lack of justification, but by a lack of capital which is likely to be available. <sup>1/</sup> More realistic perhaps is the Ministry of Education's own target of a six percent enrollment growth rate per annum. If this target is met, it would imply an investment program in

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<sup>1/</sup> Teacher supply too is a problem, but there are a variety of low cost solutions which would suggest that the current lack of teacher trainees and the low retentivity of in-services personnel, as a problem, is secondary in priority. The problem of first priority is the scarcity of development capital for secondary school construction.

year one of US\$3.6 million (908 student places), and an allocation of US\$157.7 million (at 1978 prices) over the next two decades. This would obtain a secondary school enrollment capacity of 55,000 students by the year 2000. However, from the evidence currently available, our recommendation would be that the six percent per annum growth rate be used as a minimum.

81. Placing emphasis upon primary and secondary education does not imply that there are not other needs as well--in higher education, research, evaluation, management, business administration and the like. Nor do these emphases imply a rigid lock-step process, that is, to not invest in priority B until priority A was 100% complete. Emphasizing primary and secondary education simply recognizes the inevitable--that a solid foundation must be constructed before a system can expect its higher level training--specialized or non-specialized--to function at a point near efficiency. Emphasizing primary and secondary education moreover implies a need for long-range as opposed to project-by-project planning. In this effort we would recommend a partnership between Malawi and those development institutions which have both long-range interests in Malawi and the ability to make long-range planning commitments. At the very least Malawi should--from a variety of sources--be investing a minimum level of new resources of US\$7.9 million/year in secondary education and US\$3.5 million/year in primary education (US\$11.4 million/year) over the next two decades. This US\$228 million additional investment program in basic education would be sufficient to lay the human capital foundation required for economic development in agriculture, commerce and manufacturing. Without it the progress in other sectors will be inhibited by lack of the basic skills necessary to deal with the inevitable changes in economic organizations and technology that can be anticipated between 1980 and the year 2,000.

Educational Investments and Equality

82. Concerns emanating from academic institutions in high income countries as to whether investments in education would act to exacerbate social inequalities are not applicable to Malawi at this point in time. Students from relatively underprivileged backgrounds tend to perform just as well on achievement examinations as do students from backgrounds of relative advantage. Furthermore, those from underprivileged backgrounds - if they attend secondary school - find employment just as quickly, and seem to earn just as much. Educational investment in Malawi, in sum, acts to promote talent based upon merit and helps to generate - not detract from - social equality.

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Table 1

## GOVERNMENT EXPENDITURE/PUPIL: 1927 AND 1929

<u>Year</u>	<u>Scholars Enrolled</u>	<u>Schools Fees Collected</u> £	<u>Government Grants-in-Aid</u> £ s d	<u>Mission Expenditure</u> £	<u>Percentage of Total Revenue Spent on African Education by Government</u> a/ (%)	<u>African</u>		<u>European</u>			<u>Ratio</u>
						s	d	£	s	d	
1927	166,022	1,768	4,295-2-10	41,525	1.8	-	6.2	4	11	2	177:1
1929	135,746	900-1,800	8,360-3-8	33,534	3.4	1	2.8	8	10	5	138:1

a/ In 1977, by contrast, the proportion of total government revenue allocated to (by definition) African education was 3% of development expenditure budget and 14% of the recurrent expenditure budget.

Source: Nyasaland Government Census, National Statistical Office, Zomba.

PROPORTION OF THE POPULATION LITERATE IN ENGLISH  
AND OR A VERNACULAR LANGUAGE

<u>Region</u>	<u>1945</u> (%)	<u>1966</u> (%)
Northern Region	13.4	55.1
Central Region	5.9	35.1
Southern	<u>6.2</u>	<u>31.6</u>
Total	7.2	35.8

Source: Nyasaland Government Census, National Statistical  
Office, Zomba, 1945; 1966.

Table 3

PRIMARY SCHOOL ENROLLMENT IN MALAWI: 1911-1978

<u>Year</u>	<u>Male</u>	<u>Female</u>	<u>Total Students</u>	<u>Number of Schools</u>	<u>Total Population</u>	<u>Proportion of the Total Population Enrolled in Primary Schools (%)</u>
1911	69,669	27,898	97,567		737,153 <sup>1/</sup>	13
1926	105,604	73,449	179,053	2,788	1,263,291	14
1938	119,600	86,602	206,202	4,170	1,573,454 (1931)	13
1948	136,022	81,200	217,222	4,536	2,049,914 (1945)	11
1959	not available		293,480		not available	
1962	not available		331,532		not available	
1967	not available		297,456		4,039,583 (1966)	7
1969	not available		333,996		not available	
1972	not available		430,504		not available	
1974	not available		537,301		not available	
1978	403,827	271,913	675,740	2,294	5,561,821 (1977)	12

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<sup>1/</sup> "de jure population": includes Malawians living abroad and excludes persons such as tourists who are only temporarily in the country.

Source: Nyasaland Government Census, National Statistical Office, Zomba, 1911, 1926, 1938, 1948, 1959; Ministry of Education, Planning Unit, Educational Statistics 1971-1978, July, 1978.

Table 4

ENROLJMENT IN SECONDARY SCHOOLS: MALAWI 1948-1978

<u>Year</u>	<u>Number of Students</u>
1948	116
1953	584
1959	1,300
1960	1,681
1961	2,066
1962	3,108
1963	3,908
1964	5,951
1965	8,019
1966	6,539
1967	7,970
1968	9,283
1969	9,647
1970	11,008
1972	12,868
1973	13,455
1974	13,779
1975	13,900
1976	14,451
1977	14,826
1978	15,140

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Source: Nyasaland Government Census, National Statistical Office, Zomba, 1948; Government Report, National Statistical Office, Zomba, 1953; Ministry of Education, Planning Unit, Educational Statistics, 1959-1970.

Table 5

NUMBER AND TYPE OF VOLUNTEER EXPATRIATE PERSONNEL SERVING  
IN MALAWIAN SECONDARY SCHOOLS 1962-1970

	<u>Canadian University Service Overseas (CUSO)</u>	<u>Voluntary Service Overseas-UK (USO)</u>	<u>Peace Corps Volunteers-USA (PCU)</u>	<u>Total</u>
Number	37	200	494	731

Source: Private correspondence.

Table 6

COST TO THE MALAWI GOVERNMENT OF VARIOUS TYPES  
OF SECONDARY SCHOOL TEACHERS 1962-1970  
(E p.a.)

	Expatriate Contract Teachers	Canadian University Service Overseas (CUSO)	Voluntary Service Overseas - UK (USO)	Peace Corps Volunteers - US (PCU)	Local Soche Hill Graduates <sup>a/</sup>
Housing	108	108	108	108	108
Salary (approximate)	1,000	747	600	384	384
Transportation	150 <sup>c/</sup>	25	25	6	-
Medical Care	50	30	50	35	35 <sup>b/</sup>
Miscellaneous <sup>d/</sup>	-	-	-	9	-
<b>Total Cost Per Year/ Teacher</b>	<b>1,208</b>	<b>910</b>	<b>783</b>	<b>542</b>	<b>527</b>

a/ Qualified to teach the first and second year students only.

b/ Medical expenses are covered by the Malawi Government for all citizens.  
Usually does not include dental care.

c/ This would not apply for contract teachers hired locally.

d/ Includes in-country orientation and other specific arrangements.

Source: Private correspondence.



Table 7

ENROLLMENT GROWTH IN HIGHER EDUCATION: 1966-1978

<u>Year</u>	<u>In Malawi</u>	<u>Abroad</u>
1966	487	561
1967	665	518
1968	919	506
1969	1,033	471
1970	1,051	430
1971	1,133	219
1972	1,128	606
1973	1,167	468
1974	1,208	500
1975	1,289	536
1976	1,178	849
1977	1,153	577
1978	1,322	
1979		

Source: Malawi Statistical Yearbook 1978, Government Printer, Zomba.  
Ministry of Education, Planning Unit, Educational Statistics,  
1971-1978, July, 1978.

Table 8

RECURRENT COSTS OF POST-SECONDARY EDUCATION  
(1978)

	<u>Bunda</u>	<u>Chancellor</u>	<u>Polytechnic</u>
Teaching	332,334	726,840	314,036
Library	36,471	188,845	64,367
Student Living	76,691	187,534	94,651
Administration	84,165	96,178	86,923
Maintenance	117,192	167,291	146,853
Travelling and Transport	53,278	85,110	53,759
Other	3,800	7,850	5,600
Student Allowances	<u>55,607</u>	<u>88,440</u>	<u>49,212</u>
<b>Total</b>	<b>759,538</b>	<b>1,548,088</b>	<b>815,401</b>
Number of Students	386	600	336
Number of Established Teaching Staff	38	97	41
Recurrent Cost/Student <sup>1/</sup>	1,968	2,580	2,427
Student/Faculty Ratio <sup>1/</sup>	10:1	6:1	8:1

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<sup>1/</sup> At a comparable American university in 1979 - student/faculty ratio: 20:1; recurrent cost/student: US\$4,580 (vs. US\$ 3,034 for the Polytechnic).

Table 9

ACADEMIC ACHIEVEMENT IN PRIMARY SCHOOLS:  
IN MALAWI AND 16 OTHER COUNTRIES  
(percent of items correct)

Country	Reading Comprehension	General Science	Sentence Comprehension <sup>c/</sup>
<u>LDCs</u>			
Malawi <sup>a/</sup>	34	42	61
Thailand	<u>b/</u>	47	<u>b/</u>
Chile	61	36	42
India	53	36	27
Iran	39	32	39
LDC Average	46.8	38.6	42.3
<u>DCs</u>			
England	71	56	82
USA	67	61	77
Sweden	72	60	86
Scotland	70	51	79
Netherlands	69	48	82
Flemish Belgium	65	53	85
Japan	<u>b/</u>	61	<u>b/</u>
Germany	<u>b/</u>	51	<u>b/</u>
Hungary	70	53	60
Finland	74	57	74
French Belgium	74	48	88
Italy	65	55	84
DC Average	69.7	54.5	79.7
Overall Average	55	50	69

<sup>a/</sup> Average age in Malawi among those who responded to the achievement items was 16 years old; in all other countries the respondents were 10 year olds.

<sup>b/</sup> 10 year olds did not take this test in these countries.

<sup>c/</sup> Percentage missing one or none of nine items. In Malawi the first two items were given as examples; therefore the percentage represents seven rather than nine items. This constitutes a 22% advantage.

Source: Basic Economic Mission.

Table 10

THE AVAILABILITY OF PHYSICAL FACILITIES IN PRIMARY SCHOOLS:  
MULANJE AND NSANJE DISTRICTS 1979 <sup>1/</sup>

District School	Nsanje			Mulanje						Average
	Lulwe	Bangula	Magoti	Mpachika	Makulo	Mangazi	Nyezelera	Manyamba	Chanunkha	
Miles away from a paved road	60	0	1	4	5	60	40	8	2	20
No. of Pupils	317	712	296	307	405	278	476	608	556	439
No. of Seats (pupil/Seat Ratio)	17 (19:1)	48 (15:1)	26 (11:1)	60 (5:1)	85 (5:1)	152 (2:1)	88 (5:1)	116 (5:1)	84 (7:1)	(8:1)
No. of Desks (Pupil/Desk Ratio)	9 (35:1)	0 (712:1)	26 (11:1)	52 (6:1)	86 (5:1)	66 (4:1)	58 (8:1)	120 (5:1)	84 (7:1)	- (88:1)
Value of Furniture, Books, & Equipment/ Pupil (K)	2.28	1.6	2.86	5.82	4.93	7.91	3.53	4.74	3.69	4.15
Value of Furniture, Books and Equipment received in FY79/ Pupil (K)	--	-	-	-	1.26	.98	.52	1.21	-	.99

<sup>1/</sup> Schools selected at random.

Source: Basic Economic Mission.

Table 11

RATIO OF PRIMARY SCHOOL PUPILS/TEXTBOOK  
IN NSANJE AND MULANJE DISTRICTS 1979 1/

District Schools Books/Curriculum	<u>Nsanje</u>			<u>Mulanje</u>						Average
	Lulwe	Bangula	Magoti	Mpachika	Makulo	Mangazi	Nyezelera	Manyamba	Chanunkha	
Arithmetic	2.1:1	3:1	1.9:1	1:1	1.8:1	1.5	2.8	1.9	2.6	2.1
English	1.6:1	2.3:1	2.4:1	1.1:1	2.2:1	1.2	2.5	1.8	2.2	1.9
Chewa	1.7:1	2:1	1.5:1	1.4	1.8:1	1.4	2.5	2.5	2.6	1.9
Science	--	--	--	--	--	--	--	--	--	--
History	--	--	--	--	--	--	--	--	--	--
Geography	--	--	--	--	--	--	--	--	--	--
Religion	--	--	--	--	--	--	--	--	--	--
Health Ed.	--	--	--	--	--	--	--	--	--	--
Agriculture	--	--	--	--	--	--	--	--	--	--
Average <u>2/</u>	1.8	2.5	1.9	1.2	1.9	2.6	2.6	2.1	2.5	2.0

1/ Schools selected at random.

2/ Average reflecting books for Arithmetic, English and Chewa only.

Source: Basic Economic Mission.

Table 12

THE OCCUPATION OF SECONDARY SCHOOL- LEAVERS  
1976-1978

(N=928)

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	Studying (%)	Unemployed (%)	Employed <u>a/</u> (%)	Other <u>b/</u> (%)
Preliminary Phase (1976)	100.0	----	----	----
Year I (1977)	51.8	12.6	20.8	14.8
Year II (1978)	49.6	6.0	22.7	21.7

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a/ Includes both those who are salaried and those who are self-employed.

b/ Includes those not in the labor force and those who did not respond.

Source: Tracer Study of Secondary School Leavers, Ministries of Labor and Education.

Table 13

OCCUPATION OF SECONDARY SCHOOL STUDENTS TWO YEARS  
AFTER THEIR 1976 JCE AND MCE EXAMINATIONS, BY  
EXAM SUCCESS AND SEX

(N=928)

	Still in School or Training (%)	Working <sup>a/</sup> (%)	Unemployed <sup>a/</sup> (%)	Other <sup>b/</sup> (%)	Total Percent	(N)
Female Fail JCE	34.2	15.8	15.8	34.2	100	(38)
Male Fail JCE	28.0	28.0	16.0	28.0	100	(25)
Female Pass JCE	74.0	----	4.0	22.0	100	(100)
Male Pass JCE	76.0	7.0	4.0	12.7	100	(237)
Female Fail MCE	30.2	18.9	18.9	32.0	100	(53)
Male Fail MCE	18.1	42.9	11.3	27.8	100	(133)
Female Pass MCE	35.9	26.6	7.8	29.7	100	(64)
Male Pass MCE	44.6	34.9	0.7	20.1	100	(278)

<sup>a/</sup> Includes both those who are salaried and those who are self-employed.

<sup>b/</sup> Includes those (few) who are not interested in employment as well as those who did not respond.

Source: Tracer Study of Secondary School Leavers, Ministries of Labor and Education.

Table 14

TYPE OF EMPLOYER TWO YEARS  
AFTER LEAVING SECONDARY SCHOOL  
(1978)

<u>Civil Service</u> (%)	<u>Statutory Body</u> (%)	<u>Private Enterprise</u> (%)	<u>Total Percent</u> (N)
48	16	36	100 (211)

Source: Tracer Study of Secondary School Leavers, Ministries of  
and Education.



Table 15

DISTRIBUTION OF OCCUPATIONAL CATEGORIES  
TWO YEARS AFTER LEAVING SECONDARY SCHOOL

(1978)

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	Percent (N=211)
Professional & Technical Workers	7.0
Clerical & Related Workers	67.0
Sales Workers	7.0
Service Workers	5.0
Farmers, Fishermen & Foresters	8.0
Production Workers, Transportation Workers, Equipment Operators & Labourers	6.0

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Source: Tracer Study of Secondary School Leavers, Ministries of  
Labor and Education.

Table 16

SUB-SECTOR OF EMPLOYMENT  
TWO YEARS AFTER LEAVING SECONDARY SCHOOL

(1978)

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	Percent (N=211)
Agriculture, Forestry, Fishing	21.0
Transportation	12.0
Manufacturing	5.0
Communications	2.0
Electricity, Water, Gas	1.0
Construction	6.0
Wholesale Trade	9
Retail Trade	7
Hotels and Restaurants	2
Real Estate	1
Insurance	1
Banks	8
Public Administration and Defense	15
Sanitary Services	1
Social and Community Services	8
Household and Personal Services	1
<hr/>	
Total	100

Source: Tracer Study of Secondary School Leavers, Ministries of Labor and Education.

Table 17

EARNINGS OF THOSE IN THE LABOR FORCE  
TWO YEARS AFTER LEAVING  
SECONDARY SCHOOL

	(A)	(1978) (B)	(C)
<u>(Males Only)</u>	Average Earnings of <u>Those Working</u> (K/month) (N)	Number of <u>Unemployed and Not in Training</u> (N)	<u>Adjusted Average</u> (K/month) <sup>a/</sup>
JCE	28.5 (21)	14	17.1
MCE	44.8 (155)	17	40.3

<sup>a/</sup> Assumes that the productivity of anyone in column (B) is zero.

Source: Tracer Study of Secondary School Leavers, Ministries of  
Labor and Education.

Table 18

CORRELATIONS AMONG FAMILY BACKGROUND,  
EDUCATION, AND LABOR MARKET VARIABLES IN MALAWI, 1978

(N = 310) <sup>1/</sup>

	1	2	3	4	5	6
1) Parental Educational Attainment	-	-.09	.12*	.14*	-.09	-.04
2) School Quality (Boarding = 1/Day = 2)	-	-	-.21**	-.29**	.13*	-.03
3) Sex (Male = 1/Female = 2)	-	-	-	-.22**	.12*	-.12*
4) Years in Secondary School (JC = 1/MCE = 2)	-	-	-	-	.00	.26**
5) Examination Performance (1 = pass/2 = fail)	-	-	-	-	-	-.24**
6) Earnings, Yr. II	-	-	-	-	-	-

\* p < .01

\*\* p < .001

<sup>1/</sup> Secondary school students in 1976 who were in the labor market in 1978, whether employed or unemployed.

Source: Tracer Study of Secondary School Leavers, Ministries of Labor and Education.

Table 19

THE INFLUENCE OF FAMILY BACKGROUND  
AND EDUCATION VARIABLES  
ON SECONDARY SCHOOL EXAMINATION SUCCESS

(N = 400) 1/

	<u>B</u>	<u>Beta</u>	<u>% of Explained Variance Accounted for by: (%)</u>	<u>F</u>
1) School Quality (Boarding = 1/Day = 2)	-40.8	-.39	56	60.0
2) Sex (Male = 1/Female = 2)	-36.7	-.34	37	55.1
3) Parental Education	1.6	.13	7	40.3

1/ Examination success = aggregate of the five best subjects (JCE only).  
 $R^2 = 23.4$ . All F-Ratios are statistically significant at the  $p < .01$  level.

Source: Tracer Study of Secondary School Leavers, Ministries of Labor and Education.

Table 20

THE INFLUENCE OF FAMILY BACKGROUND AND  
EDUCATION VARIABLES ON EARNINGS

(N = 310)

<u>Variable</u>	<u>X</u>	<u>S.D.</u>	<u>B</u>	<u>Beta</u>	<u>% of Explained Variance Accounted</u>		<u>F</u>
					<u>For</u>	<u>By:</u> (%)	
1) Years in Secondary School	1.82	.39	28.8	.45	56		69.6**
2) Examination Success (1 = pass/2 = fail)	1.44	.49	-20.1	-.39	42		53.4**
3) Parental Education	8.53	4.65	.17	.03	0		.31
4) School Quality (Boarding = 1/Day = 2)	1.49	.50	- 4.8	-.09	2		2.6*
5) Sex (Male = 1/Female = 2)	1.22	.41	1.4	.02	0		.16
6) Earning, Yr. II	20.84	25.03	-	-			- -

\* p = < .05

\*\* p = < .01

R<sup>2</sup> = 32.7

Source: Tracer Study of Secondary School Leavers, Ministries of Labor and Education.

Table 21

AVERAGE MCE AND JCE MATHEMATICS PERFORMANCE  
BY LEVEL OF PARENTAL EDUCATION (1976)

MCE (range 1-9, one = highest score)

(N = 528)

<u>Years of Schooling of Most Educated Parent</u>	(N)	<u>Math</u>	<u>Physical Science</u>	<u>Social Science</u>
0-8	(247)	6.8	3.8	4.9
9-12	(179)	7.1	4.1	4.7
13 and up	(102)	7.0	4.4	4.5
Mean		7.0	4.0	4.7

	(N)	<u>JCE</u> (% correct)		
		(N = 400)		
0-8	(231)	45.3	43.3	64.4
9-12	(117)	43.9	41.4	64.9
13 and up	(52)	41.0	39.0	63.5
Mean		44.3	42.2	64.4

Source: Tracer Study of Secondary School Leavers, Ministries of Labor and Education.

## COST OF PRIMARY SCHOOL SUPPLIES IN MALAWI

(1979)

	<u>Kwacha</u> <sup>1/</sup>	
Chalk/box	.85	
Attendance register	.40	
Exercise books (40 pages)	14.00/gross	(1 gross = 144)
Exercise books (80 pages)	24.34/gross	
Sugar (1 pound)	.18	
Salt (1 pound)	.10	
Soap	.20	
1 liter cooking oil	1.50	
Matches (1 packet)	.20	
Football	31.70	
Pencils	.12/unit	
Battery	.25	
Nails	.35/pound	
Bulbs	2.00/dozen	
Blackboards	5.00/dozen	

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1/ 1K = \$US 1.25

Source: Basic Economic Mission.



## MALAWI BOOK SERVICE PRIMARY SCHOOL TEXTBOOK PRICE LIST

Arithmetic

Arithmetic Pupil's Book 1	K -45
Arithmetic Pupil's Book 2	-45
Arithmetic Pupil's Book 3	-90
Arithmetic Pupil's Book 4	-90
Arithmetic Pupil's Book 5	1-30
Arithmetic Pupil's Book 6	1-50
Arithmetic Pupil's Book 7	1-63
Arithmetic Pupil's Book 8	1-70
Arithmetic Teacher's Guide Book 1	-32
Arithmetic Teacher's Guide Book 2	-38
Arithmetic Answers Book 3	-48
Arithmetic Answers Book 4	-50
Arithmetic Answers Book 5	-52
Arithmetic Answers Book 6	-90
Arithmetic Answers Book 7	-67

Chicewa

Khw erero Book 1 Kamba	-60
Khw erero Book 2 Kwathu	-60
Khw erero Book 3 Kwayera	-66
Khw erero Book 4 Dziwa	-76
Khw erero Book 5 Nzeru	1 -00
Khw erero Book 6 Kumudzi	1 -04
Khw erero Book 7 Zagwazatha	1 -04
Khw erero Book 8 Ulendo Ku Africa	1 -38

English

English in Malawi Pupil's Book 1	-70
English in Malawi Pupil's Book 2	-90
English in Malawi Pupil's Book 3	1 -13
English in Malawi Pupil's Book 4	1 -32
English in Malawi Pupil's Book 5	1 -50
English in Malawi Pupil's Book 6	1 -10
English in Malawi Pupil's Book 7	1 -10
English in Malawi Pupil's Book 8	1 -55
English in Malawi Teacher's Book 1	1 -40
English in Malawi Teacher's Book 2	1 -80
English in Malawi Teacher's Book 3	2 -39
English in Malawi Teacher's Book 4	2 -39
English in Malawi Teacher's Book 5	-90

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Source: Basic Economic Mission.

MALAWI DISTRICT COUNCILS: SOURCES OF REVENUE <sup>1/</sup>

		1976/77	Actual 1977/78	Estimated 1978/79
		K	K	K
Head 1	Local Authority Forests	51,373	53,850	74,020
	Customary Land Forests	58,105	65,870	94,492
Head 2	Sports and Recreation	10,444	14,127	17,330
Head 3	Roads & Bridges Maintenance Grant	38,565	41,483	44,906
	Building Rents	7,686	14,269	14,312
	Hire of Motor Vehicles	32,252	38,210	55,634
	Water Transport Fares	3,536	10,190	14,800
Head 4	Clinic Fees	49,590	63,297	84,015
	Rest House Fees	95,539	128,910	188,416
	Market Fees	300,164	322,800	498,820
	Postal Grant	43,123	44,283	45,756
Head 5	School Fees <sup>2/</sup>	1,092,440	1,160,522	1,129,503
	Other	22,732	3,651	3,670
Head 6	General Revenue			
	(i) Beer Fees	135,681	180,250	206,750
	(ii) Business Premises Fees	35,755	70,800	22,960
	(iii) Registration of Marriages	1,140	2,034	1,651
	(iv) House and Water Rents	10,882	13,753	28,813
	(v) Dipping Fees	23,935	28,280	34,330
	(vi) Maize Mills	12,508	16,407	19,552
	(vii) Interest on Investments and Advances	50,926	49,471	40,199
	(viii) Other Revenue	47,563	14,075	11,612
	Government Aid:			
	Equalization Grant	258,442	226,811	248,016
	Local Rates	414,805	433,549	450,087
		K2,797,186	K2,996,892	K3,338,644

<sup>1/</sup> The same revenue is used to finance both services and programs for capital development.

<sup>2/</sup> This approximates half of all local derived revenue.

Source: Mulanje District Council Financial Records.

SCHOOL FEES TRANSFERRED TO THE MULANJE DISTRICT COUNCIL AND GOODS  
RECEIVED BY PRIMARY SCHOOLS: FY78 AND FY79

School	FY78			FY79 (to May)			Total		
	A	B		A	B		A	B	
	Amount Collected K	Value of Goods in Return <sup>2/</sup> K	(%)	Amount Collected K	Value of Goods in Return K	(%)	Amount Collected K	Value of Goods in Return K	(%)
Mpachika	All records eaten by white ants								
Makulo	1220	255	(21)	1004	509	(51)	2224	764	(34)
Mangazi	624	253	(41)	690	272	(39)	1314	525	(40)
Nyezelerera	Past records stolen-----			1126	246	(22)	1126	246	(22)
Manyamba	1674	75	(5)	1462	733	(50)	3136	808	(26)
Chanunkha <sup>3/</sup>	--	--	--	--	--	--	2590	1114	(43)
<b>Total</b>	<b>3518</b>	<b>583</b>	<b>(17)</b>	<b>4282</b>	<b>1760</b>	<b>(41)</b>	<b>1039</b>	<b>3457</b>	<b>(33)</b>

<sup>1/</sup> Schools selected at random. FY78 = October 1977 to September 1978; FY79 = October 1978 to May 1979 only.

<sup>2/</sup> Figures calculated from receipts for items actually reaching the schools.

<sup>3/</sup> Unable to differentiate between the two fiscal years.

Source: Mulanje District Council Financial Records.

World Bank Basic Economic Mission to Malawi

May, 1979

Primary School Student Questionnaire, 1979

S. Heyneman  
Education Department

Dear Primary School Pupil:

This is not an examination. We are trying to understand as much as we can about schools in Malawi. We would like to have your help. Please answer the questions which follow.

If you do not understand a question please ask us for help. Do not ask your friends.

Thank you very much for cooperating.

Please tick the correct box:

1. I am a:

boy

girl

2. How old are you:

10 years old

15 years old

11 years old

16 years old

12 years old

17 years old

13 years old

18 years old

14 years old

I don't know

3. How far do you travel in the morning from home to your school?

1/4 mile or less

3 miles

1/2 mile

4 miles

1 mile

5 miles

2 miles

6 miles

4. What did you eat for breakfast today, before coming to school?

Tick more than one if you wish:

Nothing

Porridge

Rice

Tea

Fruit

Other food? Write the name here

---

5. Tick each of the diseases for which you have been treated by a doctor:

Tick more than one box if you wish:

(1) Malnutrition

(8) wounds

(2) Malaria

(9) headaches

(3) Hookworm

(10) other? Write the name here \_\_\_\_\_

---

(4) Bilharzia

(5) Trachoma

(6) Tuberculosis

(7) Asthma

6. How often do you have fever with chills and shivering?

(1)  Never

(2)  Once/month

(3)  Once/6 months

(4)  Once/year

7. Have you ever seen blood with your stool or feces?

(1)  Yes

(2)  No



There is only one correct answer to each of the following questions. Tick the answer which is correct.

8. Which one of the following animals does NOT usually live in the kind of place mentioned?

- A. Zebras on grassy plains
- B. Seals on rocky seashores
- C. Beavers on river banks
- D. Monkeys in forests
- E. Moles in rocks

9. When Tom threw his rubber ball into the air, it came back to the ground because:

- A. the air pushed it back
- B. rubber always bounces back
- C. the earth pulled it back
- D. the air is very light
- E. the earth is a large magnet

10. Which one of the following plants is NOT grown for food?

- A. Wheat
- B. Rice
- C. Potato
- D. Sugar cane
- E. Cotton

11. Joseph was using his hand pump to put more air in the tire. After a while he found that it became harder to use the pump. This was because the

- A. air in the tire pushed against the pump
- B. air started to leak out of the pump
- C. pump got too hot to hold
- D. pump got too sticky to push
- E. tire is bigger than the pump

12. When water is boiling it

- A. changes color
- B. becomes heavier
- C. changes to steam
- D. gets hotter
- E. stops bubbling

13. Mary and Jane each bought the same kind of rubber ball. Mary said, "my ball bounces better than yours". Jane replied, "I'd like to see you prove that". What should Mary do?

- A. Drop both balls from the same height and notice which bounces higher.
- B. Throw both balls against a wall and see how far each ball bounces off the wall.
- C. Drop the two balls from different heights and notice which bounces higher.
- D. Throw the balls down against the floor and see how high they bounce.
- E. Feel the balls by hand to find which is the harder.

14. Peter wondered if sound is able to travel through water. To find out by doing an experiment, which of the following should he do?

- A. Hit two stones together in a jet of water.
- B. Hit two stones together above the water of a lake or a swimming pool and listen to the sound.
- C. Put his ear next to the water of a lake or swimming pool and hit two stones together above the water.
- D. Put his head under the water of a lake or swimming pool and hit two stones together in the water.
- E. Drop a stone into the water and listen for the splash.

15. The reason that milk kept in a refrigerator does not go sour is that the cold

- A. changes the water of the milk into ice,
- B. separates the cream,
- C. slows down the action of bacteria,
- D. keeps flies away,
- E. causes a skin to form on the surface.

Please read the story which follows. Then tick the correct answer to the questions which follow the story.

The Mountain Tailor Bird

One of the most interesting birds I have seen is the Mountain Tailor Bird. It is a small olive green bird that doesn't look at all unusual, yet it has a most unusual way of making its nest. The birds work together in pairs. First they find a leaf, the right size, and make holes along the edges with their beaks. Through these holes they thread grass. One bird pushes the thread from the outside, while the other bird sits in the nest and pushes it back until the edges of the leaf are sewn together to make a kind of bag, still hanging on the tree, in which the Tailor Bird lays its eggs.

16. What does the Tailor Bird use in place of thread?

- A. Grase
- B. String
- C. Spider web
- D. Thorns

17. The Tailor Birds are interesting because they

- A. are small and olive green in color,
- B. live in pairs,
- C. make their nests in a special way,
- D. fly very fast.

18. The Tailor Bird got that name because it

- A. is a small bird,
- B. looks unusual,
- C. can sew,
- D. has a beak shaped like a needle.

19. The Tailor Birds make their nests

- A. from leaves,
- B. in a hole in a tree,
- C. in the tall grass,
- D. with a lining of grass.

Read the next questions as fast as you can. Circle the correct answer.

20. Yesterday we went to the bus station. While we were there a big bus came in. On each side of it there were a great many

eggs                      wings                      windows

21. We saw the people get out of the bus. Some of them had bags in their hands. The bags had been in the

bus station                      people                      bus

22. We went to meet my Aunt Jane. She was coming to spend two weeks with us. We shall see Aunt Jane for two

days                      weeks                      months

23. Aunt Jane has three children. The oldest is a boy and the other two are girls. The name of Aunt Jane's oldest child is

Alice                      Mary                      Roger

24. Next week Roger will come to visit us too. He will stay and go home with my Aunt Jane. He will go home with his

brother                      mother                      sister

25. Roger is two years older than my brother John. John was ten years old last month. Roger's age is now

eight                      ten                      twelve

26. While Roger is here we will go to town. We will see the library and the hospital. These are what we like best in the

house                      store                      town

27. Mother will make a big cake for Roger. He likes sugar cake very much, and so the cake my mother makes will be

fresh                      little                      sugar

28. Roger will sleep in the same room with my brother John. There are two beds in the room. Each boy will have his own

bed                      dog                      room





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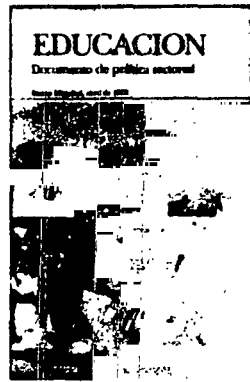
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