



statement of policy and intent

Technical Education and Vocational Training

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Foreword	by His Excellency the President, Dr. K. D. Kaunda	Page 2
Introduction	by the Hon. V. S. Musakanya, M.P., Minister of State for Technical Education and Vocational Training	3
Chapter 1	Technical education : the philosophy	5
Chapter 2	Historical background	8
Chapter 3	The Commission for Technical Education and Vocational Training 1968-69	10
Chapter 4	The new plan 1. Technologist education and training 2. Technician education and training 3. Tradesman education and training 4. Operator training 5. Up-grading training 6. Training in occupations and applied arts	11
Chapter 5	Trades Training institutes	18
Chapter 6	Conversion of the apprenticeship system	18
Chapter 7	Teacher training	19
Chapter 8	Standards and certification 1. Diploma awards 2. Certificate awards 3. Proficiency awards 4. Trade awards 5. Classes of trades certification	20
Chapter 9	Staff	22
Chapter 10	Finance	25
Chapter 11	Legislation	26
Chapter 12	Physical development	27
Chapter 13	Conclusion	29

Annexures: Details of existing training programmes
Drawings of Lusaka Trades Training Institute and Lukashya Trades Training Institute 31-32

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Foreword	by His Excellency the President, Dr. K. D. Kaunda	Page 2
Introduction	by the Hon. V. S. Musakanya, M.P., Minister of State for Technical Education and Vocational Training	3
Chapter 1	Technical education : the philosophy	5
Chapter 2	Historical background	8
Chapter 3	The Commission for Technical Education and Vocational Training 1968-69	10
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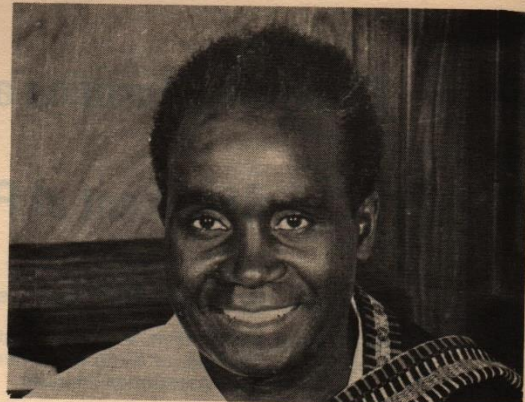
FOREWORD

by
His Excellency The President
Dr. Kenneth D. Kaunda

Since Independence my Government has striven to make the nation's new status a tangible and meaningful thing. Independence, as I have stressed so many times before, would be incomplete if it were to reflect only the political advancement of the Nation. Equally important is the economic development of growth to support the social activity of the community, which must always be directed towards the recognition of the dignity of the individual. Such a commitment, however, is not met by philosophical discourse alone, it is the effectiveness and quality of product of each member of the community which will determine the extent to which society achieves its aspirations.

Ultimately, the success of the community in striving towards its utopian image will be judged by the attitudes of the individual to his own and communal responsibilities. It must be accepted though that the objectiveness in outlook will be determined very much by the educational opportunities offered to the individual. With this in mind, the Government launched as one of its very first projects a massive development programme in the education sphere. It was, however, attuned to the more formal and academic aspects, providing secondary schools in each district and a national university.

Whilst I would not dare even slightly to minimise the necessity of providing education in the humanities, I do not consider that we would be meeting the responsibilities of this Nation, at this time and age, which is stamped with the application of technology, if we contented ourselves with being a race of aspiring historians, lawyers, philosophers, economists and politicians alone. We live in an age of technological achievement and if the Nation is to serve itself and to play an effective and productive role in the world community, it must itself be prepared to train its people, not only to use, but to maintain and create the technical apparatus which increasingly sup-



Dr. Kenneth D. Kaunda

ports the modern community. If we allow ourselves to rely entirely upon foreign expertise, we run the risk of becoming the slaves of technology rather than its master. It is imperative that Zambia now completes its total educational programme and provides training in technical and occupational fields which will give the trainee those marketable skills demanded by industry.

This document outlines the general principles of how the Government intends to tackle this problem. It is a bold statement and contains many proposals which to the uninitiated and more conservative, would appear to be too daring and ambitious, but it was not for nothing that Browning wrote: "Ah! that a man should exceed his grasp, or what's heaven for?". Without this willingness to grapple with the seemingly impossible the Nation will stagnate. This new training programme intends to clear away the old sludge and provide a clear way towards technological advancement and initiative—not merely to train Zambians to be menders of other people's conceptions.

It is my dream that in a few years Zambia will be technically competent to service the needs of its industry and furtherance of its development. I know that with the proper application and acceptance of this new training programme my dream will become a reality.

Kenneth D. Kaunda

President Of The Republic Of Zambia.

State House,
Lusaka.

6th November, 1969.

INTRODUCTION

by the Hon. V. S. Musakanya MP
Minister of State for Technical
Education + Vocational Training

The prime responsibility of any State is the development, betterment and protection of the material, social and moral welfare of its people. Since the State is only a transcendence of the totality of the people, it is, therefore, the people themselves upon whom this responsibility falls; that is to say the development, betterment and protection of the multiplicity of the welfare needs of the people must be performed by the people. In this sense the political adage "Government of the People by the People and for the People", must in terms of nation building and development be translated as "development of the people, by the people and for the people".

But in any State only a small proportion of the population is capable or has the know-how to initiate, plan and execute the national tasks necessary for growth and well being. This proportion may be referred to as the effective population, and the effectiveness of any State in performing the above functions is in direct proportion to the size of effective population, i.e. the population with the required capability, educational level and the technical know-how. Consequently responsibility for the development of the State must be interpreted as a direct endeavour to spread the opportunity for becoming effective to as much of its population as possible by way of promoting and offering general education and in particular technical education. The State must therefore accept as the highest priority the development of the human resources and ensure that every potential talent and capability of its people has been exposed to the opportunity to grow and become effective through a comprehensive educational process. This must lead to the nation being able independently or with the minimum of international co-operation (for international trade and interaction are inevitable) to control and exploit its own natural resources, its environment and convert the physical forces to the greater social advantage. When this stage has been reached the State may be considered capable

of survival, sustaining and promoting social and technological services demanded by society.

In the modern age the educational level in almost all cases determines both the quality and the depth of technological competence, but whilst the latter rarely exists on its own, the former could exist alone even in large quantities. This has been the case in Zambia and other excolonial dependencies. The colonial peoples were introduced to general education whilst the technical education necessary for their survival was available only to the nationals of the colonising powers and to a limited few of the colonial peoples. But even after Independence this anomaly was hardly recognised by independent governments which continued to proliferate education in the humanities in isolation as the *sine quo non* for clerical and political bonanzas. At the same time such states continued to employ, in even larger measures, the services of imported skills and technology. Furthermore, these skills have been subject to such vast and rapid changes that coming to grips with them on a day to day basis has been beyond the abilities of many such states. In blunt terms most of the independent developing nations have continued to masquerade in borrowed clothes only justified by political determination. Only the recognition and the eradication of the technological handicap could put any of the developing countries on a path to true independence and to take a respectable place among nations. It has to be recognised that formal education is not an end in itself, but a means to a people's acquisition of technological and vocational competence. This would ensure that they are able to service themselves and satisfy the material, social and moral welfare demanded by themselves as a community.

The Government of the Republic of Zambia in 1968 recognised this important fact as the major, if not the only eventually determining factor, in development and accordingly took an unconditional decision, in addition to the effort already being expended on general education, to concentrate on technical education and trades training. This decision completed the total commitment of Government to the realisation that the only long term solution to our development problems lies in education and training in the fullest possible development and utilisation of our human resources. Thus the Zambian youth and adults, bewildered by the new "moonward"

world, would effectively and genuinely be prepared to enter and perform the multitude of highly skilled jobs available today, and the ever rising opportunities which are on the horizon of our development.

In the development sense it is also a realisation that whilst our natural wealth may be great in the present day world of technology and rapid scientific discovery and change there are even greater riches in the knowledge and skills of men, and in this we must invest heavily in order to safeguard the nation, as well as to wisely exploit our natural resources now and in the future. This new emphasis in the national policy is in the acceptance of change in the world of mankind whose history itself is an unbroken chronicle of change. Without this change human improvement would be virtually impossible, yet such changes must go hand in hand with human knowledge and skills, to ensure that rapidity of technological change does not govern our destiny but is at the bidding and disposal of man.

In Zambia, however, we must take cognisance of our cultural, historical and physiological circumstances in our bid to jump on the technological bandwagon. Without this cognisance the attempt may be futile, even possibly dangerous. Amongst our traditions were those gathered over a long period and circumstances of survival based on elementary techniques. Some of them will of course, find place in the new world, but the majority must give way to the new order. This may be unfortunate, but it is inevitable that cherished traditions and cultures become redundant and is the price that a nation desiring to advance must pay. Those which are inherently inhibitive to scientific and technical advance and change have in the national interests to be ruthlessly eliminated.

Coupled with certain aspects of culture and tradition are the sociological inhibitions gathered over the period of colonial administration. Here are the attitudes of recent history which made the majority of our people demur practical education and employment in preference to white collar jobs and assume that technical and scientific experience was a special preserve of their European counterparts. Historically, also, it was almost established that a choice "to go to a Trade School" was an admission of being a backward student doomed to inferior status. These misconceptions and perverse



V. S. Musakanya

attitudes have to be corrected and the facts be re-established that the trades schools, technical institutes and the Institute of Technology, are part of a national educational system highly respectable and comparable to, if not better than the academic schools at appropriate levels. An important difference exists however in that technical and vocational training prepares a man for the future sustenance, and higher national contribution in a productive capacity.

Zambia's physiological circumstances demand "all hands on deck" and that every man must be trained to the maximum of his capacity, particularly technically, in order to exploit our natural resources with which the land is endowed. It is a large chunk of land, sparsely populated and surviving on the mining industry, accordingly there are certain technical abilities and skills which demand priority considerations, such as communications and mining technology.

By this policy the Government has not only presented a challenge to the youth and adults of Zambia to improve their ability to perform higher and knowledge-demanding tasks to themselves and the Nation but is at the same time the opportunity for them to do so—the challenge must be taken up. It is the prescription for survival.

V. S. Musakanya
Minister of State for Technical Education and Vocational Training.

CHAPTER 1

technical education: the philosophy

Perhaps the most vital challenge that faces Zambia in this coming decade will be how it can best prepare its youth for the ever changing occupational world that it will meet after leaving school. To overcome problems inherent in this challenge will call for a change in attitudes of many Zambians towards the value of formal education to a person's later security in employment. In itself this will call for a radical reappraisal of the approach to education and training. Zambia, with its over-riding intent to cultivate and mould its own true independent character can no longer afford the luxuries of indifferent preparation and use of its manpower resources. Training will have to be achieved through formally organised programmes which will cater for a much higher percentage of manpower resources than ever before. Even though considered as a developing nation, Zambia already has a highly sophisticated industrial sector which cannot continue to rely upon the expertise of the developed world, for it will be as much in competition with the leading nations of the world as they are amongst themselves. Impressive expansion and revision of training programmes have taken place in Britain, France, Germany, Switzerland and Russia. Each has made enormous advances in the field of technical education. Equally so, Zambia must fully own its responsibility in this field and be prepared to accept that the cost, high though it might be, is essential but that it is a sound and necessary investment. Equally important, is the need for greater appreciation of education among all Zambians both in the minds of children as well as in those of parents, some of whom think of educational levels in terms of their own success in life or their own experience, without realising the many and dramatic changes which have occurred since they left school themselves.

The need for this change stems from the incredible technological advances that have been made in our age. To keep abreast with this revolution, industry demands an education of its employee which is often higher than the average

school leaver attains and thereby accentuates the need to raise the education qualifications for entry into training programmes. The tendency to raise the educational standards for jobs is not always an artificial barrier, it is imposed to offer more advanced career opportunities to young workers, and because advances in technology require trainees to have a more intensive knowledge of chemistry, physics, mathematics and languages. The complex industrial processes and specialisation and the fact that industry cannot always afford long term informal training have also worked to raise the level of education required and has resulted in a demand that the trainee enter into the industrial world at a higher level than was the case even ten years ago. These remarks cannot be limited to just the higher levels of technology for there is a need for intensive training of manpower at all levels and at all ages. To ensure training institutes meet the demands of industry it is necessary that there be a close relationship between these two bodies and that a continuing liaison be maintained to ensure the development of adequate training programmes.

Raising the educational standards of the nation and ensuring that they meet the demands of industry is a challenge to all Zambians. Parents must play a greater part in appreciating education for their children and it is their duty to create within the home an early appreciation of its value and future application. The old idea of allowing a child to continue being educated until funds were no longer available or until the child appeared to have reached his limits, cannot be tolerated any longer for the drop out from the educational programme both academic and technical could well include the intelligent but sometimes slow developing. The State must accept its responsibility for every individual and where that individual's resources would exclude him from a training programme, then the State must provide.

There are in Zambia at the present time five trades training institutes. Livingstone, Kabwe, Mansa, Lukashya and Lusaka, which offer trade training. The Northern Technical College and its branches throughout the Copperbelt mainly provide related technical training by way of block courses for apprentices while its branches at Kitwe, Chingola and Mufulira offer courses in the commercial field. The Evelyn Hone College of Further Education, which will in future be known

as the Evelyn Hone College of Applied Arts and Commerce, provides training of a similar kind as well as banking, journalism, home economics and health science and laboratory programmes. Notwithstanding the services provided by these institutes the greatest shortage or deficiency in the field of technical and vocational education in Zambia is that of facilities. Additional Trades Training Institutes must be established and each must be properly equipped to develop the technical skill demanded by industry. Facilities for technical education are expensive and must be so if they are to keep abreast with technological advancement. To try to economise in these facilities would jeopardise the whole programme and have dire and serious consequences upon the economic development of the nation. All training centres and particularly the Trades Training Institutes must therefore be upgraded and extended.

His Excellency the President has always emphasized the need to develop Zambia's human resources. It can build up and produce its own roads and dams by foreign design and expertise but achieve nothing if it does not train its own human resources to conceive, design, implement and maintain such structures. Unless Zambia produces such skilled men of its own it must become a parasitic nation relying upon the skills and wealth of others. This does not mean that the Zambian training programme should be identical to those implemented in other parts of the world. It must, at all times be geared to its own requirements and give emphasis in those areas held to be of importance to the economy. Only thus will it become competitive and make its contribution with the rest of the world.

The acceptance and implementation of a training programme would be meaningless if all Zambia is prepared to do is to wrap that programme up in a parcel of empty words. It must be applied with vigour and resolution, and it must remain viable to meet the changing needs and advances made in the field of technology. Whatever forms or directions the roads to a better education and better training Zambia may take, they will undoubtedly require imagination and initiative, even bold steps if it is to meet the challenges of this decade and those of the future. To despise, restrain or ignore that imagination and initiative can only impede the nation's progress towards prosperity and its ultimate goal of real independence.

Despite the vigour with which we might implement our desires to achieve rapid change, we cannot succeed if the input and the methods are either inadequate, outmoded, or not based upon definable beliefs. We have, therefore, to be clear in our minds as to our basic beliefs in the implementation of the programme. We believe:—

- a. that the potentiality of man's development is infinite and, therefore, the social and class barriers obtaining in the traditional practices of apprenticeship training are unacceptable;
- b. that every human activity and performance is capable of improvement and attaining greater efficiency by training;
- c. that education in general is a means to man's own realisation. This realisation is attained by an efficient combination of both hand and mind when he works and fashions natural forces to his advantage. In recognition of this fact, St. Thomas of Aquinas defined man as "habet homo rationem et manum";
- d. that every citizen is entitled to technical and vocational training to such an extent as his educational background, creativity, and aptitude will allow him, and the opportunity, therefore, must always be provided; and finally
- e. that investment in the educational and human skills does not only deserve the highest priority, but is the only meaningful and permanent form of national development.

At Independence, Zambia inherited from Britain the apprenticeship system as the only form of training for technical and vocational occupations and to have decided to drop this altogether has raised doubt amongst the conservative and older generations of masters who cannot conceive that there is a better alternative. The objection is utterly without consideration as to its appropriateness to Zambia's social and economic conditions; whether the system's capability to produce the desired numbers of skilled workers who are adequately competent both practically and theoretically; whether or not other countries which have achieved skilled manpower self-sufficiently have done so through the employment of the apprenticeship system.

The apprenticeship system has its origins in the role-structured society obtaining in the Middle Ages, further reinforced by the industrial revolution but made more complicated and restrictive by the emergence of the Trade Unions. Crafts emerged as sort of secret or magical organisations restricted to the accepted members of the craft who included the immediate family of the craftsman. In order for the outsider to be trained, he had to be apprenticed (or indentured) to the master craftsman which in fact meant attachment in legalised servitude of a youngster who watched the craftsman at work and did chores mostly irrelevant to the skill he was supposed to acquire. In return he probably got board and lodging and later on paid a very nominal fee for his services. After five years the apprentice was pronounced skilled and set up shop on his own or in partnership with his master.

The continuation of this system became increasingly ridiculous with the advent of specialisation whereby many industries and artisans only produced a small part of the whole and the apprentice, therefore, acquired a very limited knowledge although he was eventually pronounced skilled in the whole trade. Furthermore, with the advent of production geared industries, the apprentice spent a great proportion of his time on a limited line of production and, as often as not, never availed himself of the opportunity to attend the night schools (where they existed) for theoretical background. Despite this and many other shortcomings, the system served certain needs of the now developed countries because their social systems were conducive to it and there were sufficient skilled artisans to whom apprentices were indentured.

Transplantation of this system to Zambia, however, was from the start doomed to failure in that before Independence, and even today, not only were all the artisans Europeans, but they also owned all the industries and all practised social and racial discrimination and debarred Zambians from apprenticeship. Even in the later years, when a few were apprenticed, they could only go into a limited range of trades (see Table X), and never had the social contact with their masters after work which is an essential ingredient in the apprenticeship system. This has had the effect after so many years, of producing only sixty qualified Zambian artisans with limited theoretical and practical competence.

After Independence the situation was worsened by the exodus of a large number of skilled Europeans in industries leaving only a few men to whom the desired number of Zambians may be apprenticed. However, these few masters are too busy ever to pay any attention to the apprentices. The scheme broke down and its continuation is meaningless.

A study of the scheme has proved that in the entire period of apprenticeship of 60 months, the pupil receives a maximum of 23 months of effective training and tuition so that there is even a *prima facie* confirmation that the lengthy period of apprenticeship is not justifiable neither on educational nor technical grounds. It has further been proved that the training provided under the present system could be met more effectively, both educationally and technically, by a full-time pre-employment training in institutions suitably equipped to proximate industrial and workshop conditions.

The rigid pre-conditions of entry to apprenticeship and to several trades in regard to age and education are equally unrelated to the skills and the contents of the trades, but are governed by the restrictive conditions obtaining in role-structured societies where they originate. For example, the requirement that a trainee for a diploma in Mechanical Engineering should, besides having passed Maths and Science at 'O' levels with the use of English, also possess an 'O' level pass in English, is in our conditions unrealistic to maintain as it not only leads to wastage of youths upon whom the nation has spent a fortune to put through full secondary education, but ridiculous in an apparent suggestion that the candidate will be unable to understand English despite the fact that he has done an entire secondary school course in that language and passed several subjects in it except English itself. A diploma candidate need not have a Shakespearean approach to English, but needs to understand it and apply it to his work as he does in his daily life. For this reason, it is our policy that not having passed English at 'O' levels will not be a bar to entry to a Technical Institution for the purpose of acquiring a diploma or technician's certificate in technology. Candidates will, however, besides showing the competence of understanding English be taught more English during the entire period of their training.

Apprenticeship training schemes are also based upon the industry determining the number of people to be trained for a particular trade which also pre-supposes the existence of such industries in required numbers. We have in our circumstances to ask—which comes first, the chicken or the egg? We think that skilled personnel are a prerequisite for the existence of modern industry and, therefore, we train for training's sake and industry will have its choice, but, more important, technically and vocationally trained school-leavers are a better asset than untrained school-leavers thrown on to the streets. It is of interest to note that those technologies and vocations the acquisition of whose skills has not been governed by the prohibitive traditions of Guilds system and apprenticeships, such as in the fields of electronics and aeronautics, are the ones which have made the most striking advancement in the last decade and will continue to do so in the seventies.

For these and a multitude of other reasons, we have decided to dispense with the apprenticeship training schemes and substitute them with full-time pre-employment training except in rare cases.

It must be pointed out, however, that it has not been our privilege to be the first to discover the deficiencies in the apprenticeship training systems as many countries have done so before us, such as Canada, Australia, Japan, etc., who a long time ago embarked upon pre-employment fulltime training in most trades. Britain, too, the mother of the system, has, although belatedly, discovered the suffocating effects of the system upon industry and the acquisition of skills and embarked upon a revolutionary change in training to an extent that the word "apprentice" has been "banned" from the vocabulary of industrial training. In all cases where departure has been made, it has been attended by a rapid growth of the pool of technical skills and consequently productivity.

In the formulation of its policy, the Government has reminded itself that its ultimate objective is the development of initiative and originality in its citizens and not merely to make them menders of the mechanical and other products made by others. Accordingly, all inputs in the system necessary for the development of talent, creativity, and initiative must be injected. It is in this respect that the teaching of art and design, and even music, have got a high priority in the programme.

CHAPTER 2

historical background

Vocational training as such, is not new to Zambia, for as was the case with general education, the missionaries pioneered vocational training some years ago. The missionaries needed hands to build their churches, stations and schools as much as they needed teachers to teach Catechism and religion. As an expediency, therefore, they established, practical training schools for carpenters and bricklayers in the early 20's at Kawimbi, and later on at Mbereshi by the Presbyterians, and Sefula by the Paris Missionary Society. Suddenly aware of the benefits to be reaped by local communities, for example, some reasonably sophisticated house construction as can be seen in the Luapula Valley, the training at Mbereshi became formalised in the early 30's and the older generation of building foreman has had his training there. It will be noted that the missionaries such as Catholics who had skilled workers in the way of religious and lay-brothers did not enter this field of training until much later.

By the 1940's most mission schools had attached to them, carpenters and builders workshops, for which they never received any financial support from the Government which appears not to have catered for such training until 1935 when the training centre at Munali was started, providing instruction in carpentry and trowel trades only. It is interesting to note that even as late as 1962 in the Ministry of Education of the then Northern Rhodesia Government, the view prevailed that training in these two disciplines should be given priority as they were the cheapest courses that could be offered and the ones which the Africans really needed. It was this penny-pinching approach to the subject that made the programme worthless and lacking in balance. Advanced courses or rather longer courses were introduced in the early 40's together with instructor training. In the early 50's Government schools, especially along the line of rail, following the missionary example had attached to them small carpentry and brickwork shops, but in most cases they provided only an introductory course to crafts as part of the primary school

leaving training. All along the standards attained were quite elementary and not geared to industrial practice. In the early missionary schools the entrants had barely spent four years in a primary school and at Munalu the entrance qualification remained for a long time at eight years of primary school.

When, in about the early 1950's carpentry and brickwork instructors began to graduate from Munalu, the Government accepted limited responsibility for vocational training and provided some grants to missionary trade schools, and formally established its own similar schools along the line of rail, such as Mwekera, Luanshya, Mufulira and Kitwe.

Unfortunately, it would appear that the policy was to dampen the desire for practical work and to encourage every African going to school to look to clerical work or teaching as the ultimate desire of every educated African, thus was born that anathema of the present day desire of every literate Zambian to become a white collar worker. The official view was illustrated by the fact that only about the dullest students were considered suitable to enter trade schools and the buildings at the institutions in which they worked were sub-standard to the requirements and inferior even to the primary schools from whence the trainees had come! Although courses were as long as three years, the trainees were introduced only to the very basics of the trades and those who have eventually turned out to be good tradesmen have done so largely through later experience and contact with industry.

Between 1961 and 1962 a few managed to get themselves indentured through Government departments and the number has increased very gradually, so gradually in fact that in 1969 only 68 Africans had passed through their apprenticeship schemes and received trade qualifications and those mainly in rather indifferent fields.

With such sub-standard training, unrelated to the real needs of industry, and the racial discrimination that applied in those days, it is small wonder that few Africans wished to enter any vocation apart from clerical and teaching posts. There was one saving grace however, the Trade Testing system. This system at least provided in its own small way a scheme of service and some

initiative to the worker. Its weakness lay in the fact that it partially served to retain racial discrimination within industry, and was also a paper qualification that guaranteed or provided no methodical training experience on the part of the graduate.

In late 1967 the Government of the Republic of Zambia, noted this deficiency and established the Commission for Technical Education and Vocational Training to re-vamp and formally establish technical education (a) to satisfy existing requirements of industry and commerce; (b) to ensure steady output for the future and (c) to ensure that henceforth Zambia would be technically orientated and that the youth of the country should be trained in initiative, creativity and productive hard work. This awareness was made all the more acute by Mr. W. A. B. Saunders, Principal of the Northern Alberta Institute of Technology, Alberta, who advised His Excellency the President on the general implications of establishing a new Training Programme.

Due to the physical and sociological repulsion of the trades schools, they often found it very difficult to attract entrants especially as opportunities for further academic education expanded. In 1958 there were some 15 trades schools, all of which were under-enrolled, having an average annual entry of 15 students. Not only did these institutions fail to attract students, they could not attract suitable teachers either, so much so that most of those who were in charge were undesirable workmen from the Public Works Department and who themselves were unhappily treated. Indeed, vocational training became more and more the despised Cinderella of the country's educational programme.

In 1962 the colonial authorities decided that they had to build more primary schools and looked upon the unused trades schools as ready made accommodation for the expansion of primary education and therefore several mission and government trades schools were closed and aid withdrawn. After Independence many more were closed leaving only Lukashya, Livingstone and Kabwe.

Under the direction of Mr. Hodgson, Munalu training centre had, in the meantime, made commendable strides in technical education and when

the academic side moved to the new site, courses of City and Guilds standard were introduced and a new and attractive centre was built mostly by the trainees as it exists today. However, due to racial discrimination the Hodgson graduates never found a place in industry and it became a centre of high political agitation and bitterness which did not die out even after independence. Partly because of this, but also partly due to the little regard paid to technical and vocational training by the authorities, the technical training was discontinued and Hodgson was turned into a technical secondary school.

In 1960 as a result of the Keir Report (which was sponsored by the Government of Northern Rhodesia and the Federal Government), the Northern Technical College run as a private organisation sponsored by the Ndola Lottery, had its position confirmed for apprenticeship training and received the backing of industry and Government. The report also established the status of Evelyn Hone College of Further Education. In spite of the subsequent action of the Ministry of Education mentioned above, the Keir report recommended continuation and expansion of Hodgson training college.

The Northern Technical College was organised on the basis of apprenticeship and a block release system aimed at giving trade qualifications according to the standards set by the City and Guilds London Institute. Nominally in 1960 it became possible for Africans to be indentured and become apprenticed, but Africans never managed to get that indentureship as the employers were unwilling, on racial grounds, to take them. In addition the secondary education system was so undeveloped that few acquired the necessary entry qualifications. Consequently, Africans continued to go to Hodgson until it was closed down.

CHAPTER 3

the commission for technical education and vocational training 1968-69

In January, 1968, His Excellency established the Commission for Technical Education and Vocational Training in the Office of the Vice-President, the immediate responsibility being delegated to the Hon. C. H. Thornicroft, M.P., Minister of State who had been previously responsible for the same subject when it was part of the Ministry of Education. The first Commissioner was Mr. J. B. Mwemba, who had previously been Permanent Representative of Zambia at the United Nations in New York. Other senior members of the Commission's staff were Mr. L. Mfula, Acting Deputy Director and Mr. E. K. H. Fundafunda, Head of Trades Training Institutes.

The first task of the Commission was to decide how best the accepted recommendations of Mr. Saunders should be implemented but owing to its lack of properly qualified staff, His Excellency the President set up a Working Party to study the Saunders Report under the Chairmanship of Mr. A. J. F. Simmance, Staff Development Adviser.

Whilst the Government had been provided with a number of recommendations by Mr. Saunders and the Working Party, the Commission still did not have within its staff structure sufficient expert personnel to devise plans and implement a programme as envisaged by His Excellency the President in his speech in Parliament on 22nd January, 1969, when he declared, "My Government is aiming at a complete technological advance in the shortest time possible as a result of which I must warn you that although we may look with nostalgia on our past, we must not expect our children in the next generation to share our outlook; they will be an entirely different breed who, braced with modern technology will face the competitive world in confidence and unassailable pride of black Africa." The Commission made desperate attempts to obtain the services of Professor Dybzeck of Tuskegee Institute of Alabama. This effort proved fruitless however, and being technically unqualified to present a new programme the Commission had to content itself by maintaining the status quo of a most unsatis-

factory training programme but at the same time allowing some movement for possible extensions of training facilities. To this end the Government made provision in its 1969 estimates for extensions to be made to the Livingstone Trade Training Institute, for the re-opening of the Mansa Trades Training Institute and for the building of new Institutes at Chipata, Mongu and Solwezi. However, additional efforts were made to find experts when His Honour the Vice-President visited Canada during September, 1968, but the visit proved inconclusive and had to be followed up in the succeeding year.

Because of the slow rate of progress being made in formulating a new training programme, His Excellency the President, at the time of the political and the administrative changes in Government that took place in late 1968, assumed responsibility for the programme himself and announced that effective from the 1st February, 1969, the then Secretary to the Cabinet, Mr. V. S. Musakanya would become his Minister of State responsible for Technical Education. In mid-January, 1969, Mr. J. D. Mitchell, Assistant Secretary in the Cabinet Office, Lusaka, relieved Mr. Mfula, and once the Minister of State took up his appointment renewed efforts were made in obtaining expert personnel. Contacts were remade with Dean Dybzeck but unfortunately owing to a number of factors his services could not be obtained. In the meanwhile the Minister travelled to Canada where he successfully obtained Technical Assistance by way of personnel from the Canadian Government. It was agreed that in the first instance a team of Curriculum Development Specialists would visit Zambia and draw up curricula for the new Zambia Institute of Technology and to supply at a later date, teaching staff once the Institute was established. At the same time, the Minister of State secured the temporary services of Dr. Ross Ford, a one-time Director for Technical Education of the Canadian Federal Government, to come to Zambia as a Presidential Adviser. He arrived at the beginning of May, 1969, and immediately set about devising and drawing up a new plan.

In late April, Mr. J. B. Mwemba resigned from the Civil Service. At this time Dr. Ford took over as Acting Director and the title of Commissioner fell into abeyance. Advisory committees made up of representatives from Government departments and the private sector of industry were set up to

describe what was required of various levels of skilled men and to develop the curricula to be followed to allow trainees to become qualified to an acceptable standard. By the middle of July, 1969, a definite new plan began to take shape. At the same time and to the fortune of the Commission, Dr. Ford accepted the appointment of Director of Technical Education under Ford Foundation sponsorship. As a result of long standing negotiations initiated by the Minister of State, as early as 1966, as Secretary to the Cabinet, and subsequently pursued by the Director, Dr. Ford, the Canadian International Development Agency (C.I.D.A.) agreed to support the Technical Education Programme as outlined by the Commission for a period of five years. The support amounts to over Canadian \$2,000,000.

CHAPTER 4

the new plan

The Plan for developing Technical Education and Vocational Training services is conceived as a comprehensive service implementing the philosophy which has been enunciated. The scope of the programme includes those services which are required at all levels and may be identified as:

Technologist Education and Training

This programme is designed to provide graduates with an advanced knowledge of the technology of their field, approaching professional level or that of the assistant engineer. This will include a good knowledge of the application of Mathematics and Science principles to technology in their respective field.

The Technologist programme will provide a post Form V technical training for approximately 2700 hours with emphasis on the application of Mathematics and Technological principles rather than practical aspects. The entry requirements to this programme will be Form V with 2 "O" level passes in Mathematics and Science.

Zambia has never provided for the training of high level technologists, and what little training there has been at this level has been attained overseas. Being a comparatively highly industria-

lised society however, the need for such training is obviously apparent; the mining industry which depends almost entirely upon expatriate skilled labour, the railways and General Post Office all warrant provision for such training within the Plan, consequently, a Zambia Institute of Technology is to be established at Kitwe.

Courses will be provided in such fields as electronics, the engineering fields of electricity, mechanical, building, civil, aeronautics, laboratory technology and because of the pressing need of the mining industry it will have as an integral part a School of Mining which will provide courses in all phases of mining technology, including such subjects as metallurgy assaying, chemistry, surveying and other related subjects to meet the requirements of the mining industry.

Technician Education and Training

The Technician may be developed by undertaking approximately 1200 hours additional Mathematics, Science and Technological training after full craft or trade certification or by direct entrance with Form V. Candidate need not have obtained a Certificate at "O" level but must have attended a full Secondary Course which must include Mathematics and Science. The craft-based Technician is qualified to act as a supervisor or direct the activities of craftsmen, operators or semi-skilled workers.

The direct entry Technician programme will have a higher content of practical work and less theoretical than that of the technologist and be developed by a programme of approximately 2700 hours beyond full secondary school education, which includes Mathematics and Science.

For the present, technician training will be provided at the Northern Technical College, Ndola, where plans are already in hand.

The target date for the first full-time technician courses is 1st April, 1970, and the courses will be as follows:—

Technician Level ex. Form V

Telecommunications	Electrical Engineering
Electrical Engineering	Mining Engineering
Motor Vehicle Maintenance	Chemical Engineering
Mechanical Engineering	Surveying
Structural Engineering	Laboratory
Building and	Technology
Civil Engineering	

A team of Canadian Curriculum Development Specialists headed by Mr. W. A. B. Saunders undertook a detailed study of Zambian industries in August, 1969. With the advice and assistance of representatives of local industries this team has prepared a detailed report and programme on which to base the establishment of the Zambia Institute of Technology. Precise syllabuses are recommended for each field of technology as well as space and equipment requirements. Architects have been appointed and will plan the Institute based on the Curriculum Committee's Report. Some courses will commence in temporary quarters probably at the Kitwe Branch of the Northern Technical College in March, 1970, and occupation of the new buildings will begin to take place in the following year.

The Institute is being planned to accommodate up to 2,000 students. It will recruit students from senior secondary schools with holders of the G.C.E. "O" level subjects in Mathematics, and at least one other Science subject, as well as more mature students who have an equivalent educational background and a period of work experience.

To avoid duplication of training facilities and to satisfy the needs of the Mining Industry for technologists and technicians, the School of Mining will provide for both levels of training. As the mining industry is currently providing in-service training, intake into the School of Mines will be drawn from secondary schools.

The department providing training in telecommunications will operate on a similar basis.

Tradesman Education and Training

Consists of programmes designed to develop full occupational competence in a craft or a trade. The students will be trained in all phases of the craft—to an industrial standard—and graduates will be qualified to carry out all craft work with minimum of supervision.

It is planned that full trade competence will be attained by a period of six months basic or induction training to acquaint the students with common materials and processes. This will be followed by formal training in full-time pre-employment classes of 2 years' duration, covering

TABLE I

ZAMBIA'S TECHNICAL AND VOCATIONAL TRAINING PROGRAMME

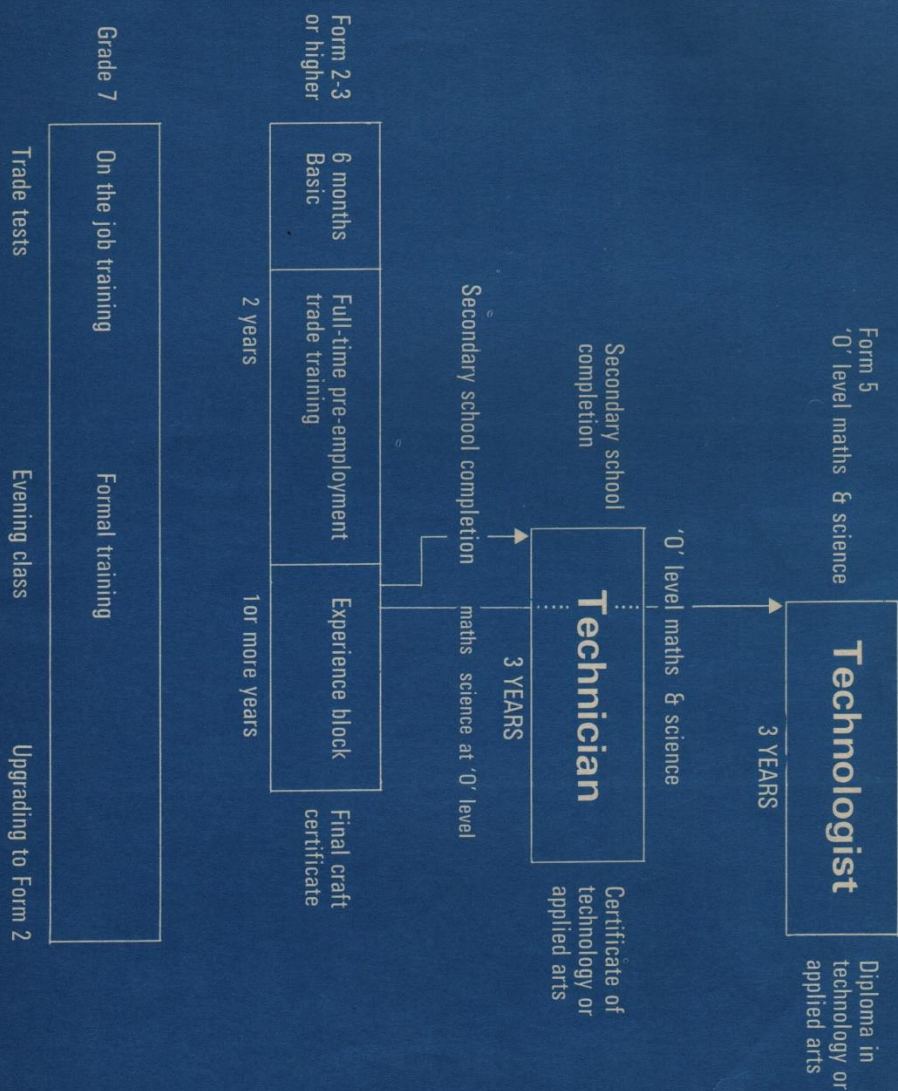
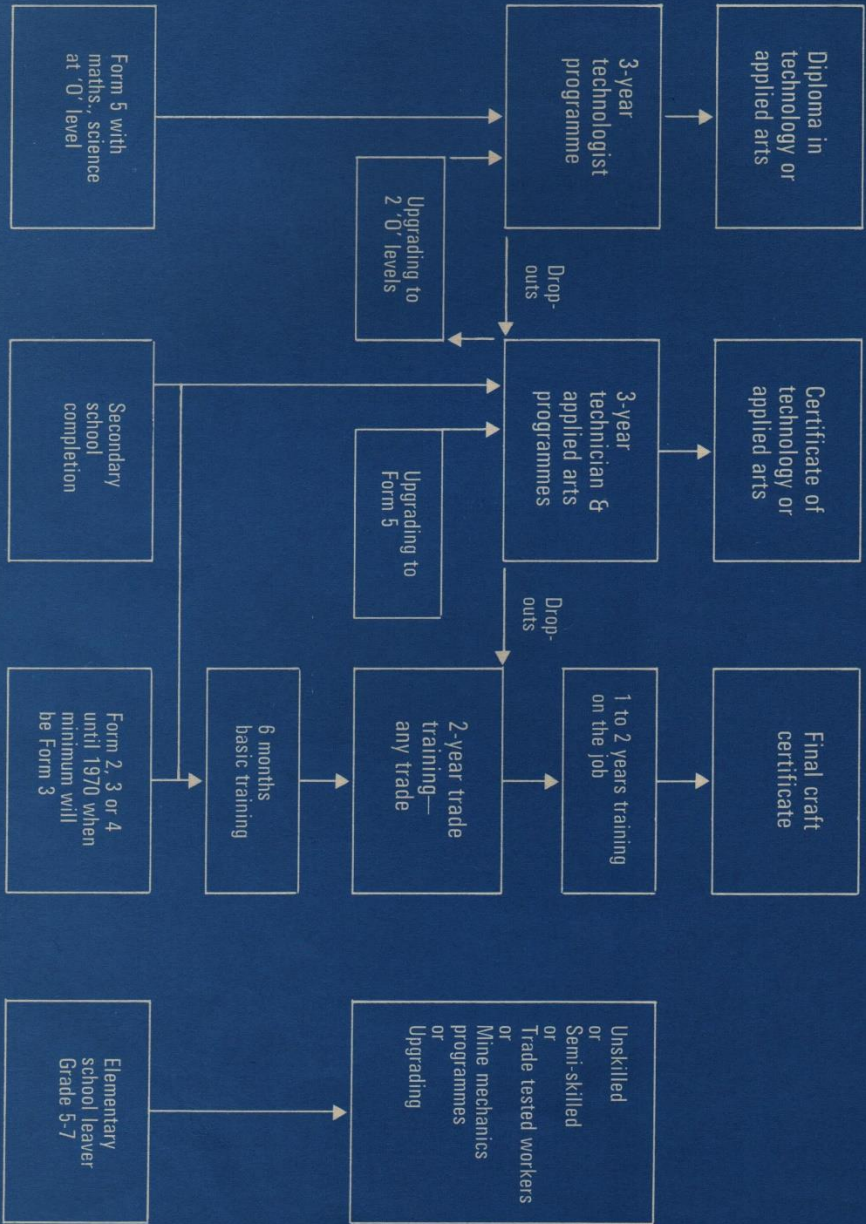


TABLE II

LADDER OF OPPORTUNITIES FOR TRAINING IN ZAMBIA



the skills, technical knowledge and craft practices of a trade. After the two years of such training, and successfully completing a Commission examination, he will be prepared to enter industry and will be awarded the Interim Craft Certificate. To obtain the Full Craft Certificate the trainee will complete a minimum of one year of practical on the job work experience as recommended by Trade Advisory Committees and approved by the Commission.

Until 1970 Form II will be required for entry into this programme after which it will be for Form III. For carpentry, and trowel trades lower qualifications may be accepted after a period of pre-vocational training.

In the new programme all trade training whether at Trades Training Institutes, Northern Technical College, the former Mine Training Schools, or those managed by religious orders, will be based on the revised syllabus. Courses will be of two years duration covering the skills and knowledge required by industry. New syllabuses have been drawn up in consultation with employers in Government and the private sector. These syllabuses are based on current practices in each industry. The present Trades Schools are being upgraded with new facilities, new equipment, the new syllabus and a reorientated and strengthened staff.

A strong feature of the Northern Technical College has been its craft section. The trade standards in the new programme will in no way differ from those at the Trades Training Institutes and as the new pattern is implemented it will become possible for students with the required educational background and standing from the Trades Training Institutes and the craft section of the Northern Technical College to progress to the craft based Technicians courses.

The continuation of craft courses at Northern Technical College will ensure the maximum use of the existing expensive equipment and the removal of some technician courses to Zambia Institute of Technology will leave spare capacity. The first full-time craft courses planned are as follows:—

Craft Level ex. Form II/III

Electrical Trade;
Motor Vehicle Repair (Mechanical);

Fitter Machinist, Craft;
Fabrication Craft;
Refrigeration, Air Conditioning;
Heavy Duty Mechanics (Diesel).

Operator Training

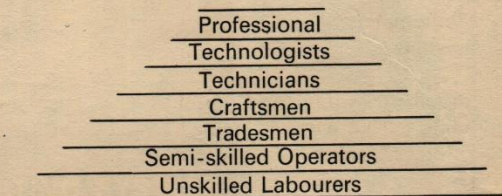
This part of the plan will provide programmes to train workers to develop the skill and competence to perform a segment or a craft or a number of the tasks of a trade or occupation.

Skill may be developed by on the job training or through periods of formal training ranging from a few weeks to a year. The entry requirements to this programme will vary with the occupation or level of competence required.

Up-grading Training

Many levels of competence are represented in the nation's labour force. The lower skill levels have the greatest numbers in their ranks, and the number at each level decreases as the requirements become more sophisticated.

A graphic representation of the labour force would be in the shape of a pyramid, with the unskilled labourer being greatest in number represented by the broad base. The number at each level tends to decrease as the level of the professional or engineer is approached.



In the labour force there is a continual movement upward in the direction of the next higher level of skill and competence. The majority of persons entering the labour force do so at a level below their potential and below the level which they strive to attain and which many eventually reach. Many entering or in the labour force at the unskilled or semi-skilled level have a low level of education, few skills and little technical knowledge, chiefly because of a lack of opportunity.

This situation identifies the urgent need for an upgrading service as an important part of the

total programme. The service required is of two basic types—

- (1) Basic Educational Upgrading in Language, Mathematics and Science.
- (2) Instruction in more advanced practical skills and theory or technology of the trade or occupation.

These services are for the trade tested workers and for any employed person who wishes to upgrade his skills or technical knowledge.

Instruction will be provided either on a part-time basis by way of evening classes, or classes will be organized on a full-time basis for short periods of time ranging from a few days to several months, when numbers warrant and resources permit.

Each Trade Training Institute will organize and offer part-time instruction in basic education and theoretical training in response to viable requests or demands in keeping with their resources.

Short courses will become a special feature of the Trades Training Institute's work. The courses designed to raise the level of trade or occupational competence to more advanced levels.

The Course in Basic Education will feature :
Language
Mathematics
Science

Should the demand warrant it, a special upgrading centre will be established to speed the upgrading process.

Training in Occupations and Applied Arts

This segment of the total programme develops the skill and competence required in any of a wide variety of occupations or jobs in Commerce, primary or secondary Industry, in other services such as Health and other forms of social welfare. These may be characterized by varying mixtures of technical or practical content yet all are viable payroll jobs.

Full competence may be developed by periods of training varying from 6 months to 2 years. The basic education required for entry will be Form II

or as required by the occupation. These occupations may range from cookery to accounting. Training in this wide spectrum will be provided at the Evelyn Hone College of Further Education and in other centres on the Copperbelt which have previously been branches of Northern Technical College. It is expected these will become independent Institutes.

To date many Business, Commercial and Health courses have been geared to meet the requirements of foreign examinations, even though at times they had little relationship to the needs of Zambia. A typical example is that of Health Inspectors, who, working to a British examination have to travel to Dar es Salaam at least once during their course to receive practical demonstration on harbour health facilities which have no relevance in Zambia. Frequently, entry requirements for courses prescribed by professional societies in other countries demand such unrealistic high entry qualifications that the poor enrolment figures of the past have resulted.

Two new departments will be established at the Evelyn Hone College namely the School of Music and the School of Art and Design. If Zambians are to be trained to produce, they must also be creative. It would be an incomplete programme if we were to neglect the development of the creative ability, and for this reason it is essential that students should also be given the opportunity and training to appreciate, conceive and design. It is intended that these two Schools will stimulate Zambians to develop and learn those techniques whereby they can interpret and communicate their own aesthetic material feelings, enough to develop a sound channel for Zambian expression.

Two areas of technical training that will be catered for at The Evelyn Hone College of Applied Arts and Commerce in Lusaka are in the fields of Printing and Health Science and laboratory work. A new School of Printing and laboratories are presently under construction and will begin to accommodate students in 1970.

CHAPTER 5

trades training institutes

Owing to Zambia's history of racial and social discrimination, a two-tiered level of Tradesman has been tolerated, i.e. the more "superior" type being those who completed an organized apprenticeship programme, and the "inferior" being the product of the Trades Training Schools and the trade tested workman programme.

Originally, it had been intended that new Trades Training Institutes should be established at Chipata, Mongu and Solwezi, but to have undertaken this programme would have delayed the new training plan until 1971. Instead, it has been decided that the Commission's resources should be concentrated on upgrading and extending the existing Trades Training Institutes at Livingstone, Lukashya, Mansa, Kabwe and Lusaka and a new institute which is being built at Choma under the auspices of the Jesuit Fathers. These expanded institutes will in 1970 take about four times their present enrolment.

The training facilities for Chipata, Mongu and Solwezi are being planned for 1971 and 1972. In addition the Trades Training Schools of the Mining Companies will act as an agency of the Commission and in effect become additional Trades Training Institutes offering the same pre-employment courses planned for the Trades Training Institutes.

CHAPTER 6

conversion of the apprenticeship system

At the present time there are only 626 apprentices under training in Zambia in the following fields:—

Trades	Years					Total
	1st	2nd	3rd	4th	5th	
Automobile Electrician	1	1	4	1	3	10
Automotive Fitter/Machinist	4	1	1	—	2	8
Blacksmith	—	—	1	—	1	2
Boilermaker	10	21	11	23	23	88
Bricklayer	—	—	—	—	1	1
Carpenter	—	—	1	3	—	4
Compositor	—	1	5	1	1	8
Diesel Fitter	—	1	2	4	—	7
Electrician	8	29	32	39	29	137
Fitter	61	40	25	10	9	145
Fitter and Turner	—	1	2	20	20	43
Instrument Mechanic	—	—	1	—	2	3
Lithographer	—	—	1	—	—	1
Motor Mechanic (All Trades)	8	36	16	40	25	121
Moulder	—	—	1	—	—	3
Office Appliance Mechanic	—	2	2	—	—	4
Printer and Signwriter	—	—	—	1	1	2
Panel Beater	—	—	—	2	—	2
Patternmaker	—	1	—	—	—	1
Plumber	—	2	2	2	—	6
Printer's Engineer (General)	—	—	—	—	54	11
Process Engraver	—	—	—	1	1	2
Radio Serviceman	—	—	—	—	1	1
Rigger and Rigger/Ropeman	—	2	9	—	1	12
Sheetmetal Worker	—	—	—	1	1	2
Signal Technician	—	—	—	—	2	2
Toolmaker	—	—	1	—	—	1
Turner Machinist	—	1	2	3	2	8
Welder	—	—	—	—	1	1
Totals	92	139	119	151	125	626

The new programme plan will be a pre-employment period of training of approximately 2 years followed by an appropriate block of experience in industry.

Although the change from apprenticeship would appear to present an insuperable problem, in fact, it is not envisaged that there will be too many difficulties; for it will be seen from the chart that in the present distribution of apprentices

TABLE III

ROUTES TO CRAFTSMAN OR TRADESMAN STATUS

Full craft trade competence	Grade five test (old system) or 'First Class' (new system) Completed indentures with successful passing of final qualifying examination Successful passing of mines final trade test Successful completion of trade training institute programme plus one or more years' experience	Trade or craft certificate 'First Class'
TRADE TRAINING INSTITUTION		
Minimum of one year experience. May be extended to two	Full-time training	Full-time training
Entrance Form II		
GOVERNMENT TRADE TESTING SYSTEM		
Grade 5 trade test	Grade 6 trade test	Grade 7 trade test
Experience	Experience	Experience
Grade 8 trade test	Experience	Grade 9 trade test
Experience	Experience	Experience
NATIONAL TRADE TESTING SYSTEM		
First class training and test	Experience	Second class training and test
Experience	Experience	Third class cert. training and test
Experience	Experience	Experience
MINES TRADE TESTING SYSTEM		
Final test Training & test	Experience	Leading mechanic Training & test
Experience	Experience	Mechanic I Training & test
Experience	Experience	Mechanic II Training & test
Experience	Experience	Mechanic III Training & test
Experience	Experience	Experience

Persons may enter the trade testing system at any level of education

Minimum entrance Grade 7

CHAPTER 5

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Panel Beater	—	—	—	2	—	2
Patternmaker	—	1	—	—	—	1
Plumber	—	2	2	2	—	6
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The new programme plan will be a pre-employment period of training of approximately 2 years followed by an appropriate block of experience in industry.

Although the change from apprenticeship would appear to present an insuperable problem, in fact, it is not envisaged that there will be too many difficulties; for it will be seen from the chart that in the present distribution of apprentices

amongst the Trades, there are only five trades which have more than 20 apprentices, and would therefore require special teaching facilities and accommodation.

During the phasing out of the apprenticeship training programme, it will nevertheless receive the full attention of the Commission and will not be relegated to a position where its standards are unacceptable.

The Inspectors will be increased in number to cover all major industries and each employing establishment will be inspected frequently throughout each year. When the new training programme at the Northern Technical College and the Trades Training Institutes is established in March, 1970, no further indentures will be accepted or registered. Would-be trainees will have the choice, depending upon their qualifications to attend the Northern Technical College or a Trades Training Institute.

However, with the imposition of an intensive pre-employment training, those indentured apprentices who have yet to complete their training will be provided for at those training centres of the Copperbelt which will be staffed by itinerant teachers from the Northern Technical College, and thus permit the careful phasing out of the system.

Broad Classification of Apprentices

Trades	Location	Years					Total
		1st	2nd	3rd	4th	5th	
Automotive Engineering	All over Zambia	13	39	22	47	28	149
General Engineering	Ndola, Kabwe, Lusaka.	71	66	53	56	57	303
Light Engineering	Lusaka, Ndola.	Nil	2	3	1	7	13
Construction Industry	All over Zambia	8	31	35	45	32	151
Printing	Ndola, Lusaka.	Nil	1	6	2	1	10
Totals		92	139	119	151	125	626

CHAPTER 7

teacher training

Perhaps the most critical problem to be faced and overcome in the introduction of an intensive programme of technical education development is adequate staff. While there are numbers of well educated and technically trained Zambians in Industry and Commerce, they have become established in responsible posts and it is doubtful if many can be attracted into the teaching profession.

However, every attempt will be made to do so and a series of Technical and Vocational teacher training courses have been arranged, starting with the first group of 15 students in September, 1969 at the National Institute of Public Administration in Lusaka. The second course will be for the present staff of the Trades Schools who will be given reorientation courses in January and February, 1970. These classes will be based at the Natural Resources Development College off the Great East Road.

Time is vital and it will not be possible to train adequate numbers to man the extra Trades Training Institutes being planned. Numbers are not the only criteria. It is recognized wherever technical programmes are in operation and accepted in Zambia that teaching staff employed either full-time or part-time in institutions for technical and vocational education should receive special training to include the theory, methods and practice of teaching; class management; new instructional techniques and, when necessary, the upgrading in technical qualifications.

Persons with full occupational competence and with industrial experience of at least three years are the candidates being sought. Teachers of general technical or specialized subjects should have received specialized training at a level higher than that in which they are teaching. In view of the greatly extended programme and additional levels of technical education, now being planned, inadequate numbers of teachers and lecturers may be recruited in Zambia and for a time

additional expatriate assistance may be required.

Teacher training, especially for technical teachers, must continue throughout their teaching career and therefore teachers will need to be released periodically in order that they may keep abreast of technological developments both within their field of specialization but also in pedagogy. In the new pattern of Technical Education, there will be no differentiation between related subject matter nor between Teachers and Trade Instructors in status although the basis of the training will of course differ.

To tide over the immediate problem, urgent requests have been made to International Agencies to provide teachers and lecturers to supplement Zambian resources. It is hoped that these expatriates will be recruited for a minimum of 2 years in sufficient numbers from Holland, Denmark, Sweden, Britain and Canada whilst Zambians are being trained. In view of the possible increase in the whole programme it is probable that such assistance will be needed for several years. It is planned that these volunteers will attend teacher training courses with their Zambian counterparts.

It is proposed that the facilities, equipment and staff resources of the Zambia Institute of Technology be utilized to assist in meeting the demand for Science teachers in Zambian Secondary Schools. A programme of Science Technology is planned to train young persons in those fields of science for which there is a shortage of teachers.

The programme will emphasize the application of physics, chemistry and biology and their contribution to national life and economic development. The emphasis will be upon the encouragement of interest in things of a scientific nature and Science as a field of employment.

The graduates of this programme will have an approach to Science and its theories and applications which is inquiring and inquisitive and will contribute very materially to the development of student interest and knowledge of the field.

With an appropriate programme in professional pedagogical training, a new source of qualified teachers for an area of short supply, will be developed.

CHAPTER 8

standards and certification

It is somewhat unfortunate that both student and sometimes employers too readily accept a paper qualification without really examining the appropriateness of training and the standard leading to the qualification. In the current Trade Testing System, for example, the production of a particular Trade Test certificate in no way guarantees that a person has undergone any formal and methodical training. The new training programme, will, instead be designed to ensure that examinations denote a standard and therefore the awards of the Commission will be kept simple but will describe the holder's achievement in meaningful terms.

A feature of the total programme at all levels will be that opportunities will be provided and the requirements clearly indicated for students who show marked ability and interest to transfer or progress from one level to more advanced levels of competence and skill.

Diploma Awards

The advanced category of award will be the Diploma of Technology, or the Diploma of Applied Arts.

The Diploma of Technology will be granted to students who have successfully completed a three year course of approximately 2700 hours of study beyond Form 5 with "O" level in Mathematics and one science subject at the Zambia Institute of Technology or at such places where courses can be offered meeting the standard of requirements for Diploma courses. This Diploma award will be granted by the Commission in the following technologies:—

Architecture	Mechanical Engineering
Building	Mining Engineering
Civil Engineering	Instrumentation
Electrical Engineering	Chemical
Electronics	Computer Science

The list will, of course be extended as new areas of technology are included in the programme. The courses of study will be the subject of continuous scrutiny by the Commission and the Technical Education and Vocational Training Advisory Committees to ensure that they incorporate the latest development in their respective fields and may have application in the Zambian context. At a similar level in the non-technical fields the Diplomas of Applied Arts will be awarded to graduates of programmes requiring a similar entrance qualification and approximately 2700 hours of specialized training. The fields for which Diplomas of Applied Arts may be awarded would include Accounting, Business Administration and a variety of Arts courses.

Certificate Awards

The second category of award will be the Certificate of Technology which will be granted to students having completed Secondary School and who have successfully completed a course of study, approximately 2700 hours or of three years duration, and designed to develop technicians. These may contain a substantial practical element where the need for this type of training is identified. The Certificate of Technology will be awarded in the following disciplines:—

- Architecture
- Building
- Civil Engineering
- Aeronautical Engineering
- Electrical Engineering
- Electronics
- Mechanical Engineering
- Automotive Engineering
- Structural Engineering and Fabrication

In non-technical fields and at approximately the same level as the Certificate of Technology the Certificate of Applied Arts will be awarded to graduates in non-technical studies such as Secretarial work, Accounting, Art and Design.

Proficiency Awards

Proficiency Certificates will be awarded in those occupations and disciplines which are often but not always identified as vocations—Typing, Secretarial and Book-keeping, for example. The feature of these programmes will be the progressive development of skill and proficiency in the

various disciplines leading to identifiable advancement.

Trade Awards

The most difficult category and possibly the most involved is that of trade or craft certification. It has been used to identify the degrees or level of occupational competence in any one of a multiplicity of trades. It will be replaced by a national unified system of National Examinations and certification of achievement.

The purpose of the revised certification system is to remove the multiplicity of certificates at present in circulation, and replace them with a simple national system which will be applied to both the private and Government sectors.

The national system in crafts or trades will apply to the examination and certification of any, or all, persons at or below craftsman or tradesman status to include:—

- a. graduates of the Trades Training Institutes;
- b. those apprentices still under indentures;
- c. the large number of trade tested workmen now in employment throughout the country; and
- d. the mechanic training programme of the mining companies.

The national craft or trade standards examination and certification will be the official standards and certification system at this level in Zambia. This system will identify three classes or levels of trade or craft competence up to, and including, full craftsman/tradesman status with the exception that 5 levels will continue to be specified in the Mine Mechanic Training Programme, until the programme can be completely integrated into the national system. The courses of study which will prepare for examinations and lead to certification at each level will be based on an analysis of each trade or craft, identifying the skills and practices in that trade in Zambia. Certificates which are awarded will be countersigned and sealed by the Commission to give them national validity.

Classes of Trades Certification

a. Trade Examinations and Certification, 3rd Class

Those units of skill and knowledge which are of basic economic importance, the

knowledge of which are necessary for an individual to be readily acceptable in the industry will be the basis of the trade examination, 3rd Class. (This level will equate with the trade tested workman's examination and Certificate 9 and 8.)

b. Trade Examinations and Certification, 2nd Class

The basic knowledge of the examination 3rd Class, plus units of skill and knowledge specified as necessary in the branch of industry in which the craftsman is employed, will be the content of the examination, 2nd Class.

c. Trade Examinations and Certification, 1st Class

The tradesman, 1st Class, will be a person who by examination and practical experience has indicated that he has the knowledge, skill and ability to carry out any task within his craft with a minimum of supervision. This person will have successfully completed a course of training or demonstrated equivalent competence through extensive experience covering all relevant blocks or units of the trade, and been employed in industry for sufficient time to gain adequate practical experience.

Establishment of the standards for which relative certificates will be awarded will be the work of the Trade Advisory Committee of each trade, in co-operation with a central examination unit of the Commission.

Mobile teams to administer the National Trade Test will be based at each Trade Training Institute, to ensure standardization. These teams will administer tests to workers (whole applications for tests are accepted) to establish their standing or level of competence in the trade, in relation to full occupational competence. Examiners will have the regular task of administering qualifying examinations to graduates of the Trades Training Institutes.

To expedite the introduction of the system of national standards examinations, all existing trade tested workmen will be encouraged to replace existing certificates with the equivalent grade of the national system.

CHAPTER 9

staff

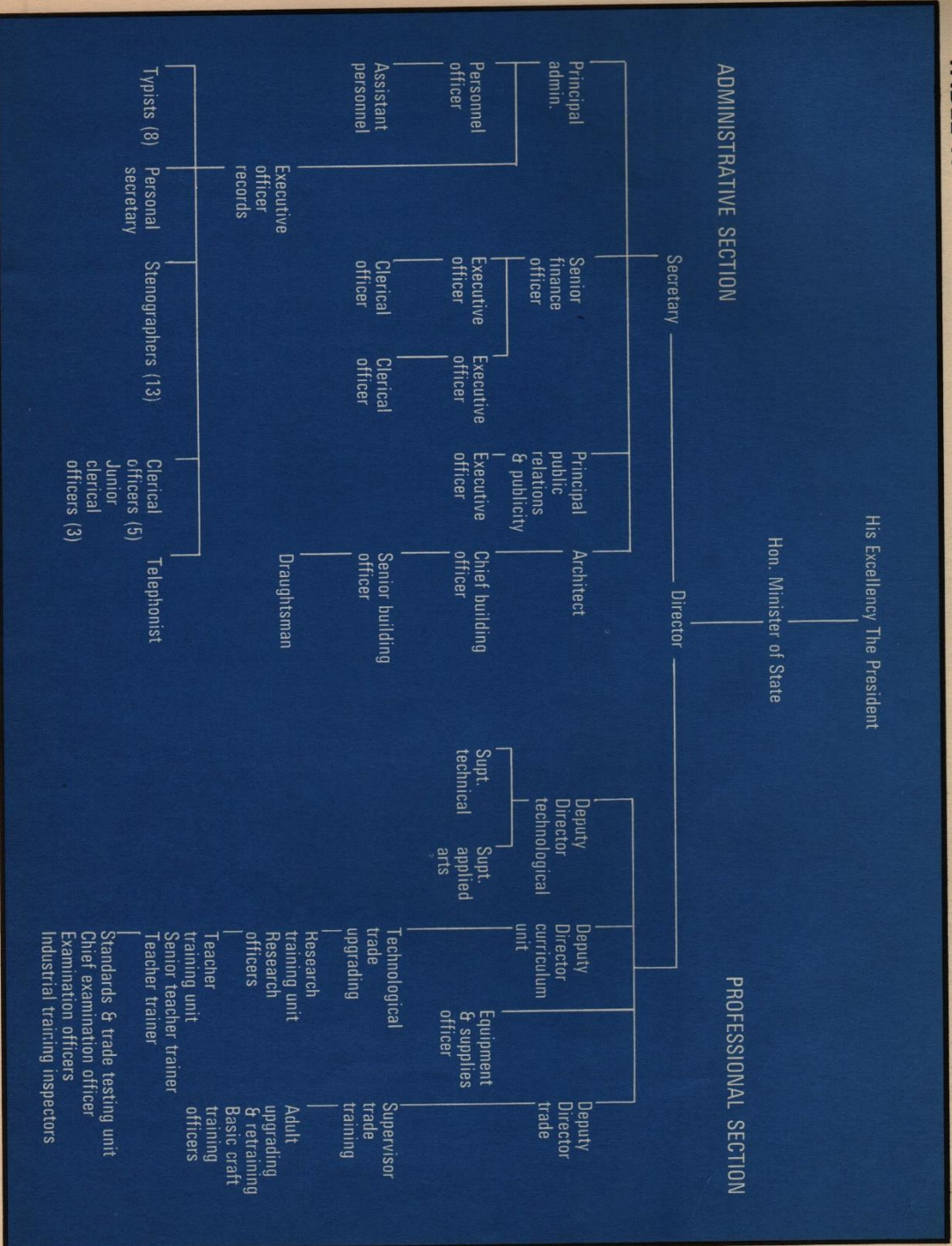
One of the main contributory causes for the Commission not having presented a plan earlier has been the lack of properly qualified staff in suitable numbers. It has already been recounted how difficult it was to recruit a Director and a close examination of staff recruitment at the Northern Technical College and the Evelyn Hone College of Applied Arts and Commerce would reveal that this case was no exception. The difficulties experienced in obtaining suitably qualified staff cannot only be linked to the world shortage of such personnel but also to the rates of pay and the slow and cumbersome procedures of recruitment condoned by the Government system, presently in force. If the training programme is to be properly manned then the present system must change, and it is to be hoped that the establishment of the Commission as a statutory corporate body will achieve this.

The headquarters of the Commission headed by the Director will consist of two sections; the professional group, which will be responsible for control of institutions, their planning and curriculum construction and liaison with industry, whilst the other section will provide administrative support.

The professional group will be divided into two main streams each headed by a Deputy Director and a third unit which will provide professional support. One stream will be responsible for the more advanced technological and applied arts programmes, such as will be carried out at the Zambia Institute of Technology, the Northern Technical College and the Evelyn Hone College of Applied Arts and Commerce. The Deputy Director will have working for him two Superintendents, one responsible for technological programmes and the other responsible for the Applied Arts.

The other stream will be responsible for the direction and supervision of training at trade level and its Deputy Director will be supported by a Supervisor of Trade Training and three officers

TABLE IV



The overall staff establishment of the Commission for 1970 will be as follows:—

Headquarters

Post	Scale	Establishment			
		'69	'70	Increase	Decrease
Minister of State		1	1	—	—
Commissioner	S/1	1	1	—	1
Director	S/3	—	1	1	—
Director	S/5	1	—	—	1
Secretary	S/5	1	1	—	—
Deputy Director	S/6	—	3	3	—
Chief Inspector of					
Trades Training and					
Vocational Education	S/7	1	—	—	1
Senior Finance Officer	S/8	1	1	—	—
Architect	Z/4/2	1	1	—	—
Inspector of Trade					
Training and					
Vocational Education	Z/4/2	6	—	—	6
Principal	A/2/1	1	3	2	—
Chief Buildings Officer	A/1	1	1	—	—
Senior Buildings Officer	A/3/2	1	1	—	—
Personnel Officer	A/3/2	1	1	—	—
Draughtsmen	A/5/3	1	1	—	—
Assistant Personnel Officer	A/5/4	1	1	—	—
Executive Officer	A/5/4	3	3	—	—
Assistant Accountant	A/5/4	—	2	2	—
Accounts Assistant	A/6	—	2	2	—
Clerical Officer	A/7	5	5	—	—
Junior Clerical Officer	A/8	3	3	—	—
Personal Secretary	F/2	1	1	—	—
Stenographer	F/3	5	13	8	—
Typists	F/4	4	8	4	—
Telephone Operators	A/7(spl.)	—	1	1	—
Superintendents	E/2	—	2	2	—
Supervisor, Trade Training	E/4	—	1	1	—
Basic Craft Training					
Officers	E/4	—	3	3	—
Inspector (Industrial)	E/9/5	2	—	—	2
Curriculum Construction					
Officers	E/3	—	5	5	—
Research Officers	E/4	—	2	2	—
Senior Technical					
Training Officers	E/3(spl.)	—	1	1	—
Teacher Training Officers	E/3	—	3	3	—
Chief Examinations Officer	E/2	—	1	1	—
Examinations Officers	E/3(spl.)	—	3	3	—
Industrial Inspectors	A/3/2	—	10	10	—
Totals		42	85	54	11
Net Increase				43	

responsible for Adult Up-grading and Re-training and basic craft training.

The supporting professional unit will be responsible for maintaining the viability of the training programme and will be made up of four sections. The first, the Curriculum Development, will consist of five officers, two responsible for up-dating curricula for higher forms of training, two for trade training and one for up-grading training. The second section will be made up of two research officers whose full-time task will be to keep the programme closely in touch with new technical developments and to advise and liaise with the Curriculum Development Unit.

Teacher training will be the responsibility of the third section which will provide the source needed to ensure that Zambia becomes self-sufficient in its supply of technical teachers in the briefest possible time. There will be one Senior Teacher Training Officer and three Teacher Training Officers.

This section will be completed by the Standards and Trade Testing Section which will be responsible for developing standards of the programmes and promoting national standards by way of examination and inspection of all places of training. Its complement of officers will be: one Chief Examination Officer, three Examination Officers, ten Industrial Inspectors and one Executive Officer.

In addition to these streams there will be an Equipment and Supplies Officer working direct with the Director.

As has been remarked elsewhere, the services of highly qualified technical staff are too expensive and hard to come by to allow them to be weighted down by petty and mundane administrative matters, and it is essential that the Commission be supported by a strong and efficient administrative arm. It will be headed by the Secretary to the Commission who will have working for him, four sections. The first will deal with general administrative matters and personnel, the more senior officers of which will be a Principal, a Personnel Officer and Assistant Personnel Officer. Office management will be supervised by an Executive Officer. The second section will be responsible for the finances of the Commission and

will comprise of a Senior Finance Officer assisted by two Executive Officers and two Clerical Officers. Responsibility for the Commission's Publicity and Public Relations (the need for which was stressed by Mr. Saunders) will lie with the third section which will have a complement of one Principal supported by an Executive Officer. The last section will be responsible for the construction and maintenance of all buildings and will be staffed by an Architect, a Chief Buildings Officer, a Senior Building Officer and a Draughtsman.

Each training institute besides having the necessary complement of teaching staff will have administrative support also, as well as ancillary staff such as matrons, cooks and an estate officer which has been a neglected area of staff complements in the past.

CHAPTER 10

finance

It must be accepted that implementing and servicing a training programme of this order is a costly exercise. It calls for the use of high quality equipment, facilities and services. Penny-pinching by using antiquated equipment can only jeopardise the success of the plan, for it must always be remembered that training standards should be adjusted as far as is possible to meet the future needs of industry as well as those of the present.

The best accommodation, the best available equipment and the most carefully prepared programme will not meet with success unless the training staff is also of the highest quality. There is throughout the world, both in the developed and developing nations, a critical shortage of technologists, and industry is in very keen competition with governments in obtaining the services of this cadre. Teaching staff will, therefore, have to be paid at rates competitive with industry.

Where then are these funds to come from?

His Excellency has already stated that industry must be prepared to meet the training cost of its employees. In Britain, a special levy for training purposes has been imposed which helps to provide

proper training for young men and spread the cost over all industry. In that sophisticated society, it has been found necessary for funds to be established for each industry, and those employers providing training are reimbursed from those funds; in one industry alone the private sector contributes more than £80,000,000 each year. The weakness of this system is that employers can cover their contribution to the fund by an increase in the price of their product, and therefore lose the incentive to provide proper training facilities. In Zambia, however, it is intended that a central fund should be established to provide for all industries and training will be provided by the Commission. Contributions will be calculated on a percentage of an employer's pay roll.

It is recognised that there are some sections of industry that are already undertaking training programmes to suit their own purposes, and the Commission will expect these programmes to continue but meeting the standards required by the Commission, until such time as the Commission is in a position to assume direct responsibility for them. Such employers will still pay the training levy, but will be reimbursed from the Central Fund to meet the cost of the approved training programmes. Authority for making this levy will be provided for in the Technical Education Training Act.

With the establishment of the Central Training Fund, it is accepted that all training recognised by the Commission will be free to both employer and trainee. Trainees will, however, be expected to meet subscription fees to the various student bodies, although these costs will be offset by allowances made to students. It is only by paying students an allowance that they can be expected financially to enter and complete their training programmes. Too often in the past students entered the Trades Training Institutes and did not go beyond the first year because they had been attracted to industry before completion of their course, which in itself has led to a lowering of standards. Where mature students enter the training scheme and have family commitments scholarships will be awarded where warranted, to offset such liabilities.

CHAPTER 11

legislation

To ensure that the new training programme has an immediate impact upon the nation, it is necessary to introduce legislation that will proscribe any deviation from the intended course and high standards to be imposed by the Commission, and will give statutory authority and support for the new programme, thus guaranteeing its integrity.

In his report, Mr. Saunders stressed that the Commission should be responsible for the hiring and firing of staff, levels of salary, purpose of equipment, buildings, mortgages etc., and let contracts without having to go through the long and time-consuming normal tender procedures. To meet this requirement it is proposed that the Commission should become a corporate body which is so essential to permit that flexibility necessary to keep abreast with the latest technological advancements and so be capable of meeting the changing needs of Zambia's industry. As such the Commission will not be burdened by the cumbersome machinery of a normal Government department, although it will be responsible to the Minister of State to ensure that at all times its actions are in accord with Government policy. The Commission will be given wide powers in order to allow it to determine national standards and curricula in the fields of technical education; to determine the remuneration and allowances of persons undergoing courses of instruction; to require employers to make use of educational training institutions, provided they are approved by the Commission. It will also be empowered to award grants or bursaries to meet the cost of courses of instruction whether they be available in the Republic or overseas. It will also have the power to raise or make loans and acquire or alienate land.

The Commission will be headed by the Director of Technical Education and Vocational Training and will be supported by one or more Deputy Directors who will be responsible for the various levels of training, liaison with industry and continual process of up-dating courses.

It is intended that a Technical Education and Vocational Training Advisory Board will be established to comprise the members of the Commission and other members who will be appointed for their special knowledge of matters relating to technical education and vocational training and others to represent the interests of the employees thus ensuring that all interested parties in this field of training are adequately represented. The function of the Advisory Board will be to advise the Minister upon all matters appertaining to technical education and vocational training in the Republic as it may think fit and upon any questions referred to it by the Minister or the Director. It will also be deemed to constitute the National Apprenticeship Council as provided for in Section 5 of the Apprenticeship Ordinance.

One of the most important recommendations of Mr. Saunders was that the training programme and all its facilities should come under one central control, and for this reason provision will be made for the abolition of the Board of Governors of the Evelyn Hone College of Further Education (to become the "Evelyn Hone College of Applied Arts and Commerce") and the Northern Technical College. By this measure it is hoped to eliminate any form of parochial influence and to ensure that these institutes meet the nation-wide requirements.

There will be provision for Inspectors of the Commission, who will be empowered to inspect all forms of technical training being undertaken throughout the country. The Commission will also be empowered to register private training institutes providing that their standards and programmes are in accord with the Commission's overall programme.

The financing of the training programme was referred to in the chapter entitled "Finance" and the new legislation will provide for the charging of the training levy upon all employers other than those of domestic workers.

Work on the proposed Bill is almost completed and it is planned that it should be presented to Parliament early in the new year at the latest.

CHAPTER 12

physical development

The sad image of technical training in the past has already been referred to, and much of this can be blamed on to the poor and often sub-standard conditions of accommodation and training facilities that were found at the Trades Schools. This is an image which the Commission must quickly dispel. Fortunately, the Northern Technical College has a different image, mainly due to the social discrimination that existed in the days of its early planning. Nevertheless, the College does need considerable upgrading and extension, and these will be provided for in parallel with the planning of the Zambia Institute of Technology whose physical outlook will be second only to the University.

Due to the past neglect of the Trades Schools the Commission has concentrated its efforts on devising plans for their upgrading and extension, and the principles for planning are outlined as follows:—

Educational Objective

The construction of additional facilities at each of the existing Trades Training Institutes will be undertaken as the initial part of the development of the total trade training programme for Zambia. The Trades Training Institutes will be designed to provide both practical, theoretical and related instruction, and thus the programme in school must cover all the operations and activities which a tradesman will be expected to carry out on the job. He must be given the related theory and technology of the occupation at the level at which he will be working. Generally these two phases of training will be carried out in the workshop area, or in classrooms provided in or adjacent to the workshops.

Approximately 30 per cent of the student's time will be spent in related studies of English, Mathematics, Science and Recreation. The site of the related classes will probably be more formal and the classroom will accommodate somewhere between 20 and 36 students. The workshop spaces, as indicated in the table over, will be

relatively large, as they are intended to provide space where the actual work of the trade may be carried out.

Link with the Community

Each Trade Training Institute, though located in a particular community, will not exclusively provide for training the young people or adults of that community. It is expected that it will be a residential centre catering for people from a much larger area. However, insofar as possible, any special training needs of the community will be met by the school. Since each Institute will be a residential centre providing housing for the students and staff, it will be relatively an independent unit as far as facilities of the community are concerned.

An effort will be made to create facilities which in themselves are attractive. There is a long history which has tended to create the impression that the trade training centres are of second-rate status, and this will be eradicated by every possible device, such as attractiveness of the facilities, quality of programme and competence of staff.

The Total Environment

The buildings, function, cost, aesthetics and instructional techniques will be considered in parallel.

The landscape, natural features, the existing buildings, and pattern of movement will be integrated, and the overall planning of each centre will be based around a central skeleton providing for the movement of students between personal and educational accommodation.

Provision for Growth and Change

The list of trades to be provided for and the subjects to be provided for each discipline give the best estimate that can be made today of the training requirements. However, these may change and alterations will be required in the services which are to be provided as time goes on, therefore the planning and buildings will be as flexible as possible. Permanent supporting walls will be provided only on the outside of the buildings, although provision will be made for forming openings between supports for future extensions. The inside of buildings will be so designed to allow for re-arrangement to provide larger or smaller instructional areas as needs are identified.

New buildings will be designed for possible change of function, and provision will be made to ensure that such changes are not bound to complexities of design inherited from a first major construction. Building designs will be simple so that extensions are obvious and future decisions are not inhibited.

Physical Objectives

It is intended that there should be approximately 10 to 12 Trades Training Institutes when the total programme is fully implemented, but, as a first stage, the facilities at the existing locations are receiving first priority, and thus allow for the initial implementation of the training programme by the end of the first quarter of 1970.

The Existing Institutes

In each and every location, facilities of some standard or other exist at the present time. These are being given special examination, with a view to using those which are suitable for the purposes of the programme; this exercise is currently in hand, and the development sketches and plans for the Lusaka Trades Training Institute and the Lukanshya Trades Institute are to be found in the Annexures.

Development Plan

By producing a development plan for the ultimate size of each institute, the architects will ensure that the institute can grow in a rational and coherent manner until they reach their ultimate size. This may take some years however, the new buildings will form a nucleus for the future, which may be expanded to meet new needs and accommodate technological and economic change.

Standards of Planning

Subjects, standards and teaching equipment and requirements for each discipline are set out below.

Generally, classrooms will also be required for teaching such related subjects as English, Mathematics and Science; for these normal secondary school standards will be adopted. Some classrooms will need to provide for up to 36 students, whilst in other instances the classes may be only half that size, and a number of rooms should be larger in size as indicated below.

It is proposed that workshop buildings should be of two different widths, which will be determined by the best conditions of lighting and

Space Standard for General Teaching Accommodation, Libraries and Halls and Administrative Accommodation					
Space No.	SUBJECT	Area per Student	No. of Students	Area of Room	Area of Teaching Storage *
(a)	General Classrooms	30 sq. ft.	20	600 sq. ft.	20 sq. ft.
			25†	750 sq. ft.	50 sq. ft.
			30	900 sq. ft.	60 sq. ft.
			35	1050 sq. ft.	70 sq. ft.
(b)	Drawing Offices	30 sq. ft.	30	900 sq. ft.	50 sq. ft.
			35	1050 sq. ft.	55 sq. ft.
(c)	Laboratory General Science	30 sq. ft.	30	900 sq. ft.	250 sq. ft. (x)
		40 sq. ft.	30	1200 sq. ft.	250 sq. ft. (x)
(d)	Libraries		0-250	1200 sq. ft.	100 sq. ft.
			250-500	1500 sq. ft.	100 sq. ft.

NOTES

* Teaching storage is for storage of books, apparatus and materials not in students' personal possession, generally there should be between 10% and 12% of teaching area as teaching storage.

† This room can accommodate 30 for elementary

work and will accommodate 25 for more advanced level work.

(x) To include preparations and other ancillary space. These could contain a reading room area which may also be used as a classroom base, a book storage area and reference area.

Schedule of Areas required for each discipline.

DISCIPLINE	Area Per Student Sq. Ft.	Storage Area Per Student Sq. Ft.
Trowel Trades	90	10
Carpentry and Joinery	100	10
Plumbing and Pipe Fitting	90	10
Sheet-metal Working		
Construction Electrician	80	10
Painting and Decoration	60	10
Machine Woodworking	100	10
Furniture Making	125	5
Boat Building	100	10
Motor Vehicle Repair		
Mechanic	125	10
Auto Body Repair	200	24
Heavy Duty Equipment & Repair "Diesel"	90	
Machinist	90	10
Electronics Maintenance & Repair of Radio and Television	35	5
Electrical Appliance & Repair	50	10
Refrigeration & Air Conditioning	75	10
Tailoring Cutting and Power Sewing Machine Operation	50	5
* Barbering		
* Hairdressing		
* Chef Training		
* Baking		
* Meat Cutting		
* Tool Making		
Agricultural Mechanics	100	10
Commercial	30	2
Related English	30	1
Related -athematics	30	1
Related Science	30	1
Pre-Vocational Carpentry	75	10
Pre-Vocational Metal Work	90	10

Note: * Yet to be decided upon.

Study space is provided in the dormitory arrangement. Common rooms are to be provided for both informal and quiet study areas.

Additional space will be provided for sanitary accommodation, sick room, or dispensary, and a box room and bedding stores.

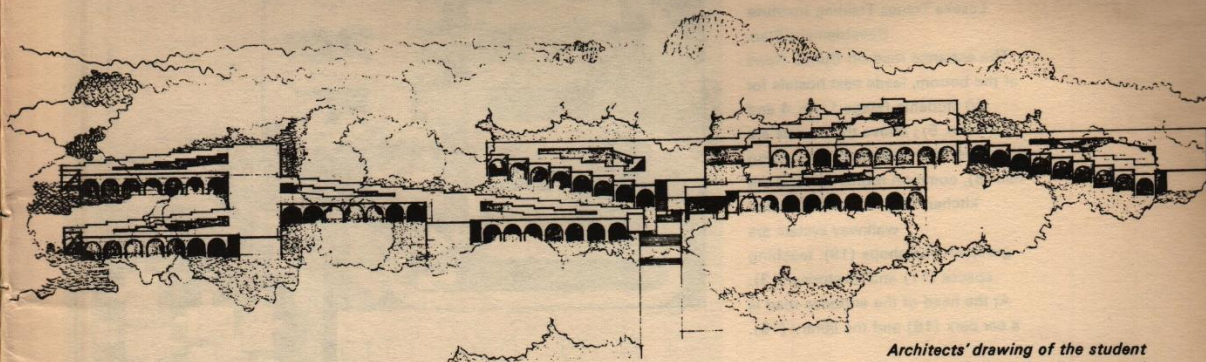
ventilation, as well as a detailed study of the equipment and activities involved in each discipline. The aim will be to standardize space as much as possible. It is hoped that this could be a floor space without pillars supporting the roof so that the roof constructed will be covered by the pillars and posts in some manner by the outside wall. In planning for the shape, an effort will be made to provide a rectangular space of dimensions in either a ratio of 1:2 or 2:3. Storage and classroom space provided in the workshop complex will also be provided for. This will provide for a quiet place adjacent to the workshop for the trade instructors to give theoretical instruction for their discipline to a group at any time during the day. This particular facility may be reconsidered if other methods of providing such a service can be suitably devised.

CHAPTER 13

conclusion

With the foregoing guidelines to its new training programme, Zambia must now ensure that the Plan is implemented without further delay. While there are still many detailed problems to be resolved, to allow the programme to be delayed until these have been resolved could well upset the whole programme for the sake of minor points of detail. As Mr. Saunders said in his report, "If, however, action is delayed because it is felt necessary to resolve every minor point before anything is done, the minor points may well be disastrously big points." In addition, the guidelines must meet the ever changing needs.

Nevertheless, the details are sufficient to permit a healthy programme to get off the ground. The Commission on its part has shown good faith in its approach to industry, and has wherever possible consulted it on most points. It is to be hoped that the goodwill that has been developed will continue by a demonstration of confidence and co-operation between the two parties.

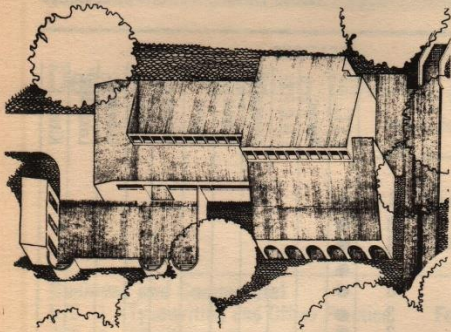


Architects' drawing of the student
hostel wings for the proposed
Trades Training Institute at Lukashya

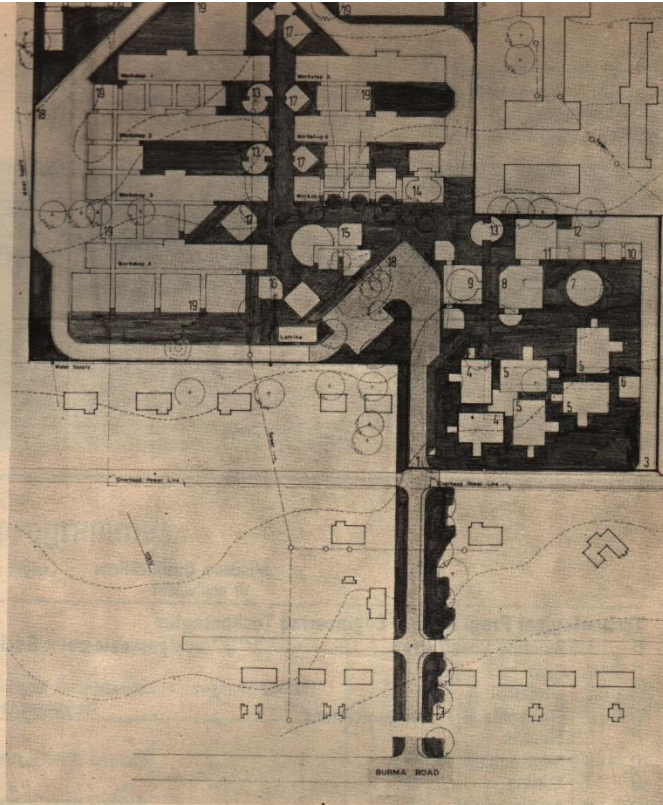
						LOCATIONS												
						Minimum Qualifications or equivalent	Length of Course Yrs.	Z.I.T.	Nortec	E.H.C.F.E.	Livingstone	Kabwe	Choma	Mansa	Lusaka	Luanshya	Lukashya	Kitwe
Technological Programmes Engineering Technologies																		
D	1	Building Construction	2 "O" level passes in maths & science			3	●											
D	2	Civil	"	"	"	3	●											
D	3	Chemical	"	"	"	3	●											
D	4	Electronic & T/Communications	"	"	"	3	●											
D	5	Electric	"	"	"	3	●											
D	6	Mechanical	"	"	"	3	●											
D	7	Mining	"	"	"	3	●											
D	8	Architectural	"	"	"	3	●											
D	9	Public Health Inspectors	Form V			3½			●									
D	10	Surveying	2 "O" level passes in maths & science			3	●		●									
D	11	Science	"	"	"	3	●											
D	12	Instrumentation	"	"	"	3	●											
Technician Programmes																		
C	1	Aeronautical Engineering	Full sec. including maths & science			3	●											
C	2	Architectural	"	"	"	3	●											
C	3	Automotive Repair	"	"	"	1		●										
C	4	Building	"	"	"	3	●	●										
C	5	Civil Engineering	"	"	"	3	●											
C	6	Electrical	"	"	"	3	●											
C	7	Electronic and T/Communications	"	"	"	3	●											
C	8	Mechanical Engineering	"	"	"	3			●									
C	9	Medical Laboratory	"	"	"	1½				●								
C	10	Science Laboratory	"	"	"	2				●								
C	11	Structural Engineering Fabrication	"	"	"	3			●									
C	12	Chemical	"	"	"	3	●											
C	13	Mining	"	"	"	3	●											
C	14	Surveying	"	"	"	3	●											
C	15	Computer	"	"	"	3	●											
C	16	Instrumentation	"	"	"	3	●											
C	17	Printing Courses	"	"	"	3	●											
C	20	Flying Training	"	"	"													
Applied Arts Courses																		
AA	1	Dispensing	"	"	"	2				●								
AA	2	Dressmaking & Fashion Design	"	"	"	1				●								
AA	3	Food Service Catering	"	"	"	1				●								
AA	4	Journalism	"	"	"	1				●								
AA	5	Photography	"	"	"	1				●								

Lusaka Trades Training Institute
Development Plan.

The entrance road off Burma Road at the bottom, leads past hostels for 50 students (stage 1, no. 4 and future no. 5); above the hostels are the round swimming pool (7), dining hall (8), common rooms (9) and the kitchen (11). Around a central walkway system are grouped workshops (19), teaching spaces (17) and lavatories (13). At the head of the entrance road is a car park (18) and the library (15).



Above: dining block of the Lukashya Institute



Below: Lukashya Trades Training Institute development plan. Main buildings (A) are in the top left hand corner of plan; underneath (B) is accommodation for students; most of the other buildings are for staff accommodation

