

# **Commonwealth Industrial Training and Experience Programme**

Meeting of the Working Group  
London, 31 January-3 February 1978



**Commonwealth Secretariat**

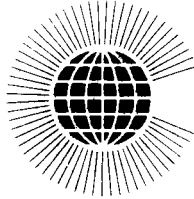
COMMONWEALTH INDUSTRIAL TRAINING  
AND EXPERIENCE PROGRAMME

Meeting of the Working Group, London, 31 January - 3 February 1978

COMMONWEALTH SECRETARIAT

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Marlborough House Pall Mall London SW1Y 5HX



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## SUMMARY OF CONCLUSIONS

1. In view of the long-felt and urgent needs of Commonwealth countries for practical training and experience in industry, essential to development, and of the limitations of existing programmes for this purpose, a Commonwealth Industrial Training and Experience Programme should be established.
2. The Programme should be broadly based, providing job-specific, in-plant training and experience from craftsman to technologist level, and should include the training of instructors and training officers, and supervisory and managerial training.
3. Each Commonwealth country should identify its own areas of priority in which overseas industrial training and experience are essential to its national development.
4. If there is, exceptionally, a need for an educational input into a training programme, a short period spent in an educational institution would be admissible provided it is not specifically for the purpose of preparing a candidate for a formal educational qualification.
5. The programme should provide in the first year for 2,000 training places in all fields; this number should be progressively increased. The duration of the training period will vary according to the needs of the trainees but will not normally exceed twelve months.
6. Each country should be urged to establish, where it does not already exist, suitable machinery to administer the Programme, which will not only identify training places in its own country but also select its nationals for training overseas within established priorities, specify the training required, and make all necessary arrangements for the reception, supervision and assessment of trainees from other countries.
7. A unit should be created within the Secretariat for administering the Programme. This unit should, as far as possible, be manned by persons having a good knowledge of the problems of industrial training in developing countries.
8. The Secretary-General should be asked to establish a central advisory body comprising representatives of industry, education and governments, to advise on the development of the Programme and particularly on placement opportunities in industry.
9. National advisory machinery representing industry, education, and government should be developed in each country, where it does not already exist.
10. The Programme should be implemented through offers from member countries of fully or partially financed training places, and through a central fund to be created for the purpose, to which should be credited additional contributions earmarked for this purpose to the CFTC from member countries, and voluntary contributions from other bodies.

11. The Secretary-General should be requested to take such steps as he may consider necessary to ensure that the above recommendations are commended to member governments and the Programme is implemented without delay.

## BACKGROUND AND ARRANGEMENTS

1. The Working Group whose report is now presented was constituted to consider a Commonwealth Industrial Training and Experience Programme, mainly on the initiative of the Seventh Commonwealth Education Conference held in Accra in March 1977. Recommendations made by other conferences and meetings of bodies whose concern was not primarily with education also contributed to decisions about its composition and terms of reference. The recommendation of the Accra Conference (as summarized on page 6 of its report) was that "proposals for a Commonwealth Exchange Scheme for Industrial Training and Experience be worked out in detail and commended to member governments". (The suggested title was changed after consideration within the Commonwealth Secretariat).
2. The idea of Commonwealth co-operation in industrial training has a long history. Successive Commonwealth Education Conferences, and a Commonwealth Conference on the Education and Training of Technicians held at Huddersfield in 1966, noted the inadequacy of facilities for practical training to complement formal courses of education at technician and degree level, and urged various solutions involving co-operation between Commonwealth countries. The Fifth (Canberra) Conference, 1971, called for every effort by developing countries to utilize and extend local training facilities for practical training and experience in their own industries, and for the help of developed countries in providing such experience where local facilities did not exist. It also recommended that "the Commonwealth Fund for Technical Co-operation (CFTC) should be used to help provide industrial experience for trainees from one developing country in another developing country where more appropriate experience may be available". The Sixth (Kingston) Conference, 1974, made no recommendations in this area. By the time the Seventh (Accra) Conference took place, additional influences were being brought to bear.
3. In July 1976 a seminar was held under Canadian and British auspices at the University of Regina, Saskatchewan, at which the Commonwealth Secretary-General gave the opening address and representatives of Commonwealth developing countries participated. The seminar saw the need for a much wider range of international opportunities to be opened to students, particularly engineering students, to complement their courses of formal education. While it was accepted that complementary training and experience should where possible be obtained in a student's or trainee's own country, it was also recognized that the training capacity in a developing country was often inadequate or non-existent.
4. The seminar endorsed the view expressed by the Secretary-General that Commonwealth co-operation in industrial training is an important component of Commonwealth industrial co-operation generally, and an important medium for the transfer of technology. British and Canadian bilateral programmes for the movement and placement of trainees were noted, as were those of UN Agencies and non-governmental networks such as the International Association for the Exchange of Students for Technical Experience (IAESTE). Without prejudice to these programmes, the participants felt that their countries' ever-growing and diversifying training needs were substantial

enough to require a more general opening-up of traffic, and that a Commonwealth-wide network should be established on a multilateral basis. The following resolution was passed:

Regional and Commonwealth Networks - It is the strong consensus of this conference that representatives of those Commonwealth countries which have not yet established national arrangements for co-ordination and informal clearing-house facilities with respect to international co-operative work activities for post-secondary students, now proceed to develop such arrangements as are appropriate to their own national needs. It is noted with appreciation that the good offices of the Commonwealth Secretariat and the representatives of already existing national co-ordinating bodies have been kindly offered on a continuing basis.

5. Other Commonwealth meetings pointed in the same direction. The Ninth Biennial Meeting of the Commonwealth Science Council in December 1976 recommended a Commonwealth programme of job-specific industrial training for technicians and for science and engineering graduates. Its conclusions were based on a survey conducted on the initiative of the Eighth Meeting to study the feasibility of such a programme. The Ninth Meeting commended its proposed programme to the Seventh Commonwealth Education Conference by means of a paper presented to that Conference setting out the CSC's proposals in some detail.

6. The Commonwealth Experts' Group (the McIntyre Group) in its final report "Towards a New International Economic Order", and the Commonwealth Team of Industrial Specialists in a progress report, also contributed to the thinking that led to the constitution of the Working Group. Both stressed the need for the transfer of new technologies and of entrepreneurial and other management skills to developing countries, and for the interchange of knowledge and experience between such countries as a means of achieving this.

7. Following the Accra Conference and in recognition of the potential importance of a Commonwealth Programme that would fulfil the many-sided needs identified by these authorities, the Commonwealth Secretary-General set up an inter-divisional committee which, between May and December 1977, gave preliminary consideration to a Commonwealth Programme and planned the meeting of the Working Group. Arrangements were made for the Group to meet in Marlborough House between 31 January and 3 February 1978, and the following terms of reference were prepared:

The working group is entrusted with the responsibility of making recommendations to the Commonwealth Secretary-General, for consideration by Commonwealth Governments, on the feasibility and modus operandi of a Commonwealth industrial training and experience programme. In carrying out this task the Working Group will consider, inter alia:

- (a) the detailed proceedings and reports of the Commonwealth conferences and meetings related to this subject including those referred to above;
- (b) existing provisions under bilateral, international and other arrangements to meet the need for increased opportunities for practical training and experience in industry;

(c) methods of financing a Commonwealth programme, including such items as administration, accommodation and transportation;

(d) the national and Commonwealth machinery and facilities required for the implementation of the programme.

8. The meeting of the Working Group opened on the morning of 31 January 1978 with an address by Mr. A.G. Tasker, Commonwealth Assistant Secretary-General and Managing Director of the Commonwealth Fund for Technical Co-operation. The ensuing discussions continued until 3 February, with Mr. E.C. Anyaoku, Commonwealth Deputy Secretary-General being present at the concluding session.

## DELIBERATIONS OF THE MEETING

### OVER-VIEW OF NEEDS AND PRIORITIES

1. After discussing points arising from the Commonwealth Assistant Secretary-General's opening address, the meeting took a general look at the needs and priorities that a Commonwealth Programme would be designed to meet, and in particular at the various levels and patterns to which priority might be given. It first considered a proposition that practical training and formal courses of education might sometimes need to be so closely integrated that a Programme should provide for both elements, and recognized that if academic courses (however job-specific) were to be included, the proposed Programme would be unwieldy and very costly. The meeting agreed that both elements might exceptionally be included, but that the focus should be on practical training and, in particular, on job-specific practical training.
2. The meeting next considered the need for a Programme at levels ranging from craft to postgraduate training and experience, wishing to cover the needs both of those countries where an important contribution to raising economic standards needed to come from the provision of craftsmen and technicians and of those where the need was to provide better-trained high-level manpower for established industries.
3. It was recognized that needs would vary between countries and between different levels of training, and that the right patterns would depend a great deal on the level and character of national industrial development. It was also recognized that language difficulties might sometimes create problems in internationalizing the training, that there were arguments in favour of craftsmen being trained in their own countries as far as possible, and that it might often prove more effective and economical to send trainers to other countries for training rather than the craftsmen and the technicians themselves.
4. Management was recognized as fundamental to the success of all industrial enterprises, and the meeting therefore agreed that there should be a management training content in those areas of any industrial training programme that the Commonwealth might initiate where the management component was needed.
5. Members of the Group illustrated the diversity of the needs from the experience of their own countries. In India, for example, there was an emphasis on training needs for village crafts and small-scale industries, but these needs were met to a great extent in India; African countries with similar needs could not necessarily meet them internally. It followed that each country must identify its own training needs. Each might also with advantage compile some kind of directory or inventory of its own training resources that others could draw upon, and compile, in addition, its own national "wants" list. The difficulty was recognized of making these registers complete and keeping them up to date. The meeting formed the conclusion, while appreciating the value of the Commonwealth Science Council's survey, that it would probably not be desirable to proceed by way of a questionnaire.

6. Job-specific training was agreed to be a priority, but not necessarily an exclusive one. The need of professional engineers and technicians for practical training or experience in industry complementary to their academic education was stressed. It was accepted that their needs were in the first place for generalized training - the normal foundation for job-specific training - and that these were not always being met. Such generalized training should as far as possible be arranged by educational institutions or by programmes other than the one being considered by the meeting.
7. The meeting noted with satisfaction that among the priorities of the CFTC Education and Training Programme was "industrial development, including small-scale industries and work experience". It accepted that industrial development was also among its own priorities, but agreed that the training requirements of such development should not be regarded as being exclusive, since the training that was needed related to all kinds of economic activity and not to industrial development alone.
8. Before proceeding to a review of existing facilities, the meeting agreed that it was an important principle that every effort should be made to avoid duplicating the training programmes of national and international bodies working in this field; therefore a Commonwealth Programme should set out to do things that other programmes were not doing, and should be distinctively Commonwealth in character.
9. The Group agreed that three main guidelines for a Commonwealth Programme were that:
  - (a) it should normally be confined to in-plant training related to specific job requirements in the trainees' countries (but might occasionally include an academic element);
  - (b) it should accommodate all levels of technological and technical training and experience;
  - (c) it should include, where appropriate, training with a management content.

#### REVIEW OF EXISTING FACILITIES

10. The Group received with appreciation the working paper CIT/78/WP 1 "A Survey of Existing Provision", which was introduced by the author. It was noted that, despite the obvious need for industrial training and experience, few of the training opportunities under some of the programmes were taken up. The point was made that the effectiveness of any such training programme was dependent on the efficient use of resources.
11. The Group interested itself in particular in the Commonwealth Scholarship and Fellowship Plan (CSFP) and the Commonwealth Fund for Technical Co-operation (CFTC). The Group was told that the CSFP was a co-operative educational enterprise, not an aid operation. Though some oversight was exercised by the Commonwealth Secretariat and the Association of Commonwealth Universities, there was no central direction and no central fund, awards being funded by each donor country. The terms of reference of the CSFP were such that it could not be extended to embrace a comprehensive programme of industrial training and experience; some of its administrative and financial arrangements might, however, provide models for an industrial training programme.

12. The meeting then turned its attention to the potential relationship of the CFTC to a Commonwealth Programme. It was informed that the Education and Training Division of the CFTC could increase the number of awards for practical training in industry between developing countries provided the CFTC's resources were expanded; otherwise any increase would probably have to be at the expense of other forms of education and training supported by the Division. It was also pointed out that the terms of reference of the CFTC virtually confined the movements it funded to movements between developing countries. However, a very small part of its budget might exceptionally be used to facilitate training and education between developed and developing countries. One reason why the Fund concentrated its education and training activities within developing countries was that many such countries possessed under-utilized education and training facilities. Another reason was that experience gained in another developing country was often more relevant to the needs of a developing country than experience gained in a developed one. While the Fund placed emphasis on this interchange between developing countries, it also recognized the need of the more advanced developing countries for access to sophisticated technologies in developed countries. It provided limited funds to meet these needs, subject to strict conditions that the training was not available in another developing member country and that the opportunity for such training did not exist under existing bilateral or multilateral programmes. Possibly the CFTC could meet industrial training needs involving interchange between developing countries if additional funds were provided for the purpose. As far as developing to developed country flows were concerned, the CFTC could act as an honest broker or catalyst to facilitate arrangements with bilateral donor countries and with international organizations, like UNIDO, which provided such training. In this way the unique role of the CFTC would not be distorted.

13. The meeting took note of these and the other programmes covered by the "Survey of Existing Provision". Information was given about the official British industrial training scheme, ILO fellowships, fellowships tenable at the International Centre for Advanced Technical and Vocational Training, Turin, and the Commonwealth Science Council's questionnaire. The meeting learnt that gathering significant information for the survey had proved very difficult, not least because statistics were presented differently or incompletely by different bodies; for example the Colombo Plan statistics included no classification representing practical training in industry or on-the-job training. The meeting noted from paragraph 130 that the Survey's "statements of the position do not add up to a quantitative or qualitative assessment of all that is going on", but nevertheless regarded it as a very valuable document tending to confirm the needs identified by the Accra Conference.

#### POSSIBLE OUTLINE OF A COMMONWEALTH PROGRAMME

14. The Group concluded from the evidence before it that the needs of Commonwealth countries were sufficiently large to warrant the introduction of a Commonwealth Programme, and turned to establishing the size of the Programme it wished to propose. It considered that the parameters of the Programme should accord with the guidelines already adopted and would be particularly affected by the categories of trainees with which it dealt, which it had been agreed might include craftsmen as well as technicians and professional and managerial grades; and it recognized that account would have to be taken of the need for training and supervision on a large scale.

15. The meeting agreed to propose that the Programme should in the first place provide 2,000 training places in all fields, that this number should be progressively increased, and that it should commence operations in 1979. It appreciated that this number of places might be difficult to find because of a number of factors, including the current economic situation and high levels of unemployment, but it was convinced that, even if a programme of a magnitude corresponding to the needs could not be established at the outset, a start must be made as a matter of urgency, and that the proposed CITEP would grow as the necessary networks and infrastructures developed.

### REQUIREMENTS OF MACHINERY AND FACILITIES FOR SERVICING A PROGRAMME

16. The meeting recognized that both Commonwealth and national machinery would have to be set up for administering the proposed Programme, and that its purposes must include relating training needs (especially those of the developing countries) with the training and supervisory resources available throughout the Commonwealth, and ensuring that incoming and outgoing trainees were properly placed and looked after in the respective countries. The meeting considered that machinery used in Britain for these purposes had features that other countries might copy when planning the administration of their national programmes; for example, the Technical Education and Training Organization for Overseas Countries (TETOC) had the function (among others) of advising upon and monitoring Britain's overseas training programme in this area, and had good working relationships with industrial firms and organizations and with educational institutions.

17. It was noted that some countries already possessed national machinery for dealing with practical training both at home and overseas, and would want the administration and funding of a Commonwealth Programme to be compatible with their own. Nigeria for example had organized its own industrial training programme, within a three-tier system; the higher-level manpower training being provided under the auspices of the National Science and Technology Development Agency, the intermediate level through the National Board for Technical Education, and the craftsman and operative level through the Industrial Training Fund. Because of the problem of funding training attachments, the Government had legislated for a levy on industry to provide money for the ITF and for the provision of training places. It was stated that, while Nigeria hoped to meet most of its vast industrial training needs from within its own resources, it also looked to outside countries for industrial attachments, and would therefore find much value in the proposed Commonwealth Programme. The meeting thought it likely that features of such national programmes could be transplanted beneficially to other developing countries.

18. The Special Commonwealth Programme for Zimbabweans was also considered to have relevant features; though administered by the Secretariat it utilized funds that are not part of the CFTC's budget. The co-ordinating role of the Secretariat in assisting Zimbabwean students by linking them to educational and funding resources in 27 countries might be similar to that of the body needed to administer a Commonwealth Industrial Training and Experience Programme.

19. The meeting recommended that a unit should be established within the Commonwealth Secretariat to assist the implementation of the proposed Programme; and that it should be staffed as far as possible by persons with a good knowledge of the problems of industrial training in developing countries.

The role of the Secretariat would be to administer funds made available to it; to act as a catalyst for bringing into being national arrangements for the placement, supervision and assessment of trainees under the Programme; and, to that end, to initiate procedures for obtaining detailed information about future employers and employment and about individual trainees.

20. The meeting also recommended that each country that has not already done so should be urged to establish suitable machinery to administer the Programme. This machinery must, on the one hand, locate training places in its own country and make all necessary arrangements for the reception, supervision and assessment of trainees from other countries; and on the other, select its nationals for training overseas, within established priorities, and specify the training required.

21. The meeting further recommended that the Secretary-General should be invited to appoint a central advisory body, including representatives of industry, education and governments, to advise generally on the development of the programme and particularly on placement opportunities in industry. This would also help to ensure that funds, expertise and support were attracted from all interested parties. In addition it was recommended that national advisory machinery representing similar interests should be developed in each country where it does not already exist.

22. The meeting was informed that the Commonwealth Team of Industrial Specialists, after examining industrialization in developing countries, would be suggesting the establishment of a consultative committee on industrial development, which would embrace industrial training. The Team had yet to present its final report, and could therefore take into account any relevant conclusions of the present meeting. The possibility that the proposed consultative committee might serve at least some needs of the proposed CITEP should be borne in mind.

### PROPOSALS FOR FINANCING A PROGRAMME

23. The meeting discussed a number of ways in which the proposed Programme might be financed, and identified two basic models. In the case of the first, expenditure would be entirely from one central fund. Resources would come from member governments making specific contributions, and from voluntary donations from other sources. In the case of the other, expenditure would be entirely by the country providing the training, again derived from either governmental or other sources. It was recognized that combinations within these two basic models were possible. The view was taken that "other sources" from which funds might be attracted might include agencies, organizations, trusts and industry. A central fund could be utilized according to need; for example, trainees from poorer countries might have both their travel and their training paid for from the fund, and trainees from less poor countries their travel alone; while some countries would be able to meet all costs.

24. Further consideration was given to the financial basis of the Commonwealth Scholarship and Fellowship Plan, the Commonwealth Fund for Technical Co-operation, and the other programmes that had been surveyed. One advantage of the CFTC over bilateral agencies was considered to be its greater speed in responding to requests. Its main disadvantage was considered to be its virtual restriction to movements between developing countries, save in exceptional circumstances; and the realities of the present position were such that a flow from developing to developed countries was likely to preponderate for quite a long time.

25. The meeting noted and discussed the following possible financial arrangements:

a CFTC budget enhanced by additional contributions earmarked for the Programme;

awards to individuals analagous to Commonwealth Scholarships and Fellowships;

a central fund to which governments and others might contribute;

an endowment fund to which industrial and commercial firms and other bodies might make voluntary contributions;

the fuller use of existing programmes;

third country training awards offered by bilateral donors;

extended provision by companies and industries for employee and customer training or experience required in other countries.

26. The meeting gave further consideration to the establishment of a central fund. It concluded that this should be created and be administered by the Secretariat; that one way in which governments could contribute to the fund would be through additional contributions to the CFTC earmarked for industrial training; and that the fund should be so constituted that it could be used for a Programme that would accommodate movements not only between developing countries and from developing to developed countries but also from developed to developing countries. The meeting considered that industry in general and international companies in particular had roles to play in the provision of finance, places, and expertise. When considering the proposition that fuller use should be made of existing programmes, the meeting noted with concern that full advantage was apparently not being taken of existing programmes such as the British official scheme and the CFTC Education and Training Programme, and requested that this should be borne in mind by member countries when the proposed Commonwealth Programme begins to take shape. The meeting also concluded that the proposed Programme could be greatly assisted towards financial viability by offers in kind as well as in cash, that is to say, offers of fully or partially funded training places by industry, governments, or any other organizations in a position to make them.

27. The meeting summarized its proposals for financing a Programme by recommending that it should be implemented through offers from member countries of fully or partially financed training places, and through a central fund to be created for the purpose, to which should be credited additional contributions to the CFTC from member countries earmarked for this purpose, and voluntary contributions from other bodies.

## IMPLEMENTATION

28. Some thought was given to ways of stimulating early action on the recommendations of the Group. It was agreed that the Secretary-General should be requested to take such steps as he may consider necessary to ensure that the recommendations are commended to member governments and the Programme is implemented without delay.

## OPENING ADDRESS

Mr. A.G. Tasker, Commonwealth Assistant Secretary-General

First let me say how delighted I am to be able to welcome you on behalf of the Secretary-General, Mr. Shridath Ramphal, to this meeting in Marlborough House to discuss ways and means of improving training opportunities in the field of industry and technology. As you may already be aware, Mr. Ramphal is in the Caribbean at present on other urgent responsibilities, but I know he would have wished to be here with us, if it had been possible.

### Economic Setting

The subject which we have invited you to assist us in examining is one which has concerned many of you over the years in your individual and official capacities, and which has engaged the attention of many previous Commonwealth conferences and seminars. The promotion of development in member states as part of a world community seeking a more just and equitable human society is clearly an important preoccupation of the Commonwealth. In this connection it is recognized that the re-location of some industries as well as the development of new industries in the developing countries is an essential element in promoting the new international economic order, and one which is in the long-term interest of both developing and developed countries alike. It is against this background that the idea of the transfer of technology and management expertise between the more developed and the less developed countries of the Commonwealth must be seen as part of a movement which satisfies the needs of the developing countries for access to technology on self-respecting terms, as well as one which ensures the growth within their countries of a capacity to generate a technology suited to their needs and stages of development.

As the Secretary-General said, speaking at the seminar in Regina University in 1976 on the potential of Commonwealth co-operation in such an expertise:

We must recognize the potential that exists within the Commonwealth for enlarging the technological capability of the developing countries. In saying this I do not mean that the Commonwealth should aim, in any manner, at becoming a closed shop developing programmes exclusive to itself. Equally, however, we should not under-estimate our capacity for promoting, within the Commonwealth, dynamic programmes which harness our inherent potential for co-operation and provide valuable models and guidelines to the rest of the world. The Commonwealth has provided important leads to the rest of the world in other spheres of endeavour. It would be particularly fitting that it should point the way for world action that truly helps the developing countries to achieve and sustain a capability for generating self-sustaining growth. The Commonwealth is representative of both the world's capability in the technological field and the world's needs for technology transfers and technological development. How better can we provide new guidelines to the world than by marrying our capability to our needs!

## Origins

I am sure that all of you here are familiar with the background to our meeting today, but let us briefly refresh our memories. Over the last ten years many Commonwealth conferences have stressed the need for co-operative efforts in the important area of industrial training and experience, especially practical training in the various aspects of industry, technology and managerial skills. In response to the acute awareness of the shortage of facilities in, or available to, developing countries, for providing such practical experience and training for their technicians and technologists, and stemming from a conference in Ottawa in August/September 1964, a special Commonwealth conference on the education and training of technicians was held at Huddersfield, England, in October 1966. That conference laid emphasis on the priority which should be given by the Commonwealth Secretariat to the training and placement problems which member states were experiencing and continue to experience in their efforts to develop their economies rapidly.

The Conference in Regina in July 1976 examined opportunities for practical work experience in an international context, and I am very glad to welcome to your meeting as observers three of the participants at that conference, led by Dr. Lloyd Barber, President of the University of Regina. We are indeed pleased to have them with us here. A seminar on technical education and industry for Commonwealth countries in the Asia and Pacific regions, which was held in Hong Kong also in 1976, considered, among other things, co-operative programmes of student placement in industry. The Commonwealth Science Council which undertook a survey of the problems of student placement for industrial training in order to ascertain the degree of support among Commonwealth countries for such a programme, established two things above all others: first, it confirmed the urgent need felt by Commonwealth governments for practical training, both at the technician level and for newly qualified graduates of science engineering as a supplement to the formal courses of instruction available in member states; second, it established clearly the existence of the desire of Commonwealth governments to assist each other in providing this additional component of job-specific manpower training that will accelerate manpower development.

As evidence of the wide spectrum of the problem, the Commonwealth Experts Group and the Commonwealth Team of Industrial Specialists have both stressed the need for the transfer not only of new technologies but also of entrepreneurial and other management skills to developing countries, and for interchanges of knowledge and experience between them.

The Seventh Commonwealth Education Ministers' Meeting, held in Accra, Ghana, in March 1977, provided the latest spur to action. That meeting called specifically on the Secretary-General to study proposals for a Commonwealth programme for providing industrial training and experience to be worked out in detail and to be commended to member governments for examination and adoption. It will therefore be clear that the need for this programme as an inter-disciplinary effort has long been recognized.

## Existing Arrangements

We are aware that there are in existence, in many of our member states, programmes which provide training and experience on an ad hoc basis. Some of these programmes are on a modest scale, while others involve larger dimensions. What is however indisputable is the great need to examine and define the scope, levels and priorities in this field of industrial and technological training. Such a definition should lead to a more systematic provision within and between member states. It should also improve the relevance of

such training to the needs of the developing countries on the one hand, and on the other hand the benefits which may be derived by the more advanced countries from the transfer of such skills and practical expertise. We in the Secretariat are confident that the Commonwealth is well equipped to devise a means whereby the practical training of students can be effected on a more comprehensive, co-ordinated and beneficial scale than in the past. One of your tasks during this meeting will be to identify the particular fields of special training, the levels of needs, and the priority fields in which such training can be successfully and effectively carried out.

You are no doubt aware of various examples of such development programmes directed towards co-operation among Commonwealth countries. I refer, for example, to the Commonwealth Fund for Technical Co-operation and to the Commonwealth Scholarship and Fellowship Plan, both of which are already playing a major role in Commonwealth development. You have before you, as an information document, a description of the nature and scope of the CFTC, which is essentially a programme of mutual self-help in which the recipient countries are also donor countries. More than one quarter of the resources available to the Fund are contributed by the developing countries; for example, Nigeria is the fourth largest contributor after Canada, Britain and Australia. Nearly one half of the CFTC experts in the field come from developing nations, and the Fund supplements opportunities for training under bilateral programmes in the industrialized countries by concentrating its own programme on training people from developing countries in other developing countries. But the resources of the CFTC are clearly inadequate for the kind of industrial training programme which we have in mind, taking note of the needs of Commonwealth countries. Even in response to national needs, some of our member states are moving thousands of technicians and technologists from their countries through bilateral and multilateral arrangements in their determination to speed their rate of development. Clearly the capacity of member states to make such arrangements varies from country to country. Yet, if there were a clearly defined and well conceived programme which provided a variety of training facilities at the different levels between the various members of the Commonwealth, the opportunities thus available would surely be used more comprehensively and more effectively than through the present ad hoc bilateral arrangements.

You are also familiar with the Commonwealth Scholarship and Fellowship Plan, which assists formal study at tertiary level institutions through awards provided by member states at both undergraduate and graduate levels. Again, in spite of the success of the Plan, the terms of reference of the CSFP are such that it would not be possible to expand the Plan in order to embrace a comprehensive programme of industrial training and experience. The administrative and financial arrangements of the CSFP may, however, provide a model for those aspects of an industrial training programme.

### Existing Constraints

Let me say frankly that we recognize the constraints and problems that are involved in the attempt to develop the kind of scheme that I have described. We know that there are immigration and employment regulations which have the effect of denying even eminently deserving placements; that liaison between government, industry and education authorities is difficult to achieve; that information on training opportunities in industry is frequently lacking; and that the attitude of some governments towards the private sector, where many placements are to be found, may be discouraging or even hostile. We know that some firms are reluctant to provide training for students from "competitor" countries; and that others fear industrial espionage. We know that the machinery of international and bilateral aid is complex, and that

placement of trainees under such auspices is a slow and cumbersome process. We know, too, that some governments, though aware of the need for practical training, cannot obey it because the student is so urgently required to take up a predetermined appointment. And, of course, we know of the all-encompassing need for funds.

In this context, I have read with interest the Macfarlane survey prepared for this meeting. Like him, I am astonished at the range of training facilities available. Like him, I am puzzled as to why, given the urgent needs expressed by developing countries, there are not more nominations for placements under the existing schemes. Is this because, in many developing countries, manpower planning departments are inadequately staffed? Do they lack the expertise to recognize training needs or, when these are identified, to tackle the task of selecting suitable trainees, or locating training resources that will match their needs?

Any programme you may devise will depend on the skills of those who operate it. You may wish, therefore, to consider the types of assistance that could be made available to some of the developing countries to help them operate the programme successfully.

These are among the difficulties that you are enjoined to study, and from your wealth of experience collectively to formulate a programme for the movement of persons which will make it possible to develop, particularly in the less advanced members of the Commonwealth, a technological framework which will generate and accelerate their capacity for self development.

You will be considering ways and means, not only of financing such a Commonwealth programme, but indeed the scope, levels, specific areas and the mechanisms for its operation. We are confident that you will approach your task imaginatively, yet with realism. No doubt you will be considering the question as to whether the expansion of existing programmes through specific pledges made by member states, or the establishment of a completely separate Commonwealth scheme, will provide the surest means for fulfilling the aspirations of member states in this matter. In this task, we place no restrictions on the collective wisdom of your group during the next few days. We trust that there will emerge a clear definition, not only of the areas of need and the priorities of member states in the provision of industrial training and experience, but also the outline of a Commonwealth programme, the nature and requirements of the mechanism, and what facilities may be required for servicing such a programme.

That your task is a complex one is obvious to all of us. Yet, if we are to move to a world of fewer inequalities, and that is perhaps the same as saying a more peaceful world, the need for economic dependence to be minimized between the rich and the poor cannot be questioned; and in this endeavour, a training programme that utilizes the full resources of the Commonwealth in a systematic and substantive manner can make a vital contribution.

Before I close I would like to thank our Chairman, Mr. H.S. Shahani, and to say how fortunate we are that he has agreed to preside over and guide your deliberations for the next few days. I know that he accepted this responsibility at short notice, but he is no stranger to international meetings and his own depth of experience and the collective wisdom of this working group will, I am sure, lead to constructive recommendations.

In conclusion, I wish to assure you that your recommendations will be very carefully studied by the Secretary-General. He attaches, in recognition

of the interest of member states in the subject, a high priority to the development of this programme, and he shares the hope that it will respond in a practical way to the needs which have been so generally and clearly recognized by our member states.

It is now my great pleasure to ask Mr. Shahani to take the chair. I wish all of you frank and fruitful deliberations in the next few days.

## LIST OF PARTICIPANTS

### MEMBERS OF THE WORKING GROUP

- Mr. H.S. Shahani Joint Educational Adviser (T),  
Ministry of Education and Social Welfare  
(Department of Education),  
New Delhi 110001, India.  
(Chairman of the Working Group)
- Sir Sze-Yuen Chung Chairman, Board of Governors,  
Hong Kong Polytechnic,  
P.O. Box 5974, Tsimshatsui P.O.,  
Kowloon, Hong Kong.
- Mr. S. Odera-Oteng Director of Industrial Training,  
Ministry of Labour, P O Box 74494,  
Nairobi, Kenya.
- Mr. M. Dikko Director, Industrial Training Fund,  
1B Naraguta Ave, PMB 2199, Jos, Nigeria
- Mr. P.B. Mramba Director-General,  
Tanzanian Small Industries Development  
Organization, P.O. Box 2476,  
Dar-es-Salaam, Tanzania.
- Mr. I. Hale Programme Director,  
Canadian Bureau for International Education,  
151 Slater Street, Ottawa, Canada K1P 5H3.
- Mr. W. McMullen Canadian International Development Agency,  
122 Bank Street, Ottawa, Canada K1A 0G4.
- Mr. G. Foggon Director, ILO London Office,  
87/91 New Bond Street, London W1.  
(alternate member, Mr. C.C.D. Miller)
- Mr. A. Daniels Director, Institute of Industrial Training,  
Brunel University, Uxbridge,  
Middlesex UB8 3PH.
- Mr. C.W. Perchard Director, Technical Co-operation Training  
Department, The British Council,  
Spring Gardens, London SW1A 2BN.  
(alternate member, Mr. A. Davidson)

### OBSERVERS

- Mr. D.H. MacLaren Education Affairs, Air Canada,  
Place Ville-Marie, Montreal,  
Canada H3B 3P7.

Dr. L. Barber	President, University of Regina, Regina, Canada S4S 0A2.
Dr. O. Ikejiani	Pathologist-in-Chief and Director of Laboratories, Glace Bay General Hospital, Glace Bay, Nova Scotia, Canada.
Mr. E.E. Temple	Assistant Secretary-General, Association of Commonwealth Universities, 36 Gordon Square, London WC1H 0PF.

### COMMONWEALTH SECRETARIAT

Mr. A.G. Tasker	Managing Director of the Commonwealth Fund for Technical Co-operation and Assistant Commonwealth Secretary-General, gave the opening address and attended part of the Meeting.
Mr. E.C. Anyaoku	Commonwealth Deputy Secretary-General, was present to represent the Commonwealth Secretariat at the closing session.
Mr. R.E.O. Akpofure	Director, Education Division
Mr. H.M. Collins	Senior Education Officer, Education Division (Secretary)
Mr. V.C. de Bruyne	Assistant Director, Industry and Economic Co-operation Sub-Division, Economic Affairs Division
Mr. I.R. Thomas	Chief Economic Officer, Industry and Economic Co-operation Sub-Division, Economic Affairs Division
Mr. P.D. Snelson	Director, Education and Training Division, Commonwealth Fund for Technical Co-operation
Mr. C. de Laet	Science Adviser
Mr. D.G. Thomas	Deputy Secretary, Commonwealth Science Council
Dr. M.N.G.A. Khan	Scientific Services Officer
Dr. G. Pingle	Project Officer, Food Production and Rural Development Division

### IN ATTENDANCE

Mr. R.L.O. Macfarlane	Author of "Survey of Existing Provision", c/o Education Division, Commonwealth Secretariat.
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# WORKING PAPER: A SURVEY OF EXISTING PROVISION

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This survey was prepared by Mr. R.L.O. Macfarlane, OBE, on behalf of the Commonwealth Secretariat, with the help of many people in many organizations. Both the author and the Secretariat wish to acknowledge, with grateful thanks, the assistance that was so freely and willingly given.

## Introduction

1. The problem of securing industrial training and experience for people from the developing countries is of long standing. Commonwealth conferences, seminars and working groups have for some years expressed concern that opportunities for practical training and experience in industry were insufficient to meet the growing needs of developing countries.
2. The First Commonwealth Education Conference held in 1959 drew attention to the importance of this provision. The issue of practical training was raised at the Second Commonwealth Education Conference in 1962 and again at the Third Conference in 1964. In 1968 the Fourth Conference considered that little progress had been made in increasing opportunities for practical training. Instead the position was deteriorating. The Fifth Conference in 1971 agreed that studies of the problem should be undertaken by the Commonwealth Education Liaison Committee. The topic was not raised specifically at the Sixth Conference in 1974.
3. A Commonwealth seminar held at the University of Regina, Canada, in July 1976 called for wider international opportunities for students to secure practical experience in industry; the 9th Biennial Meeting of the Commonwealth Science Council, held in December of that year, recommended a programme of job-specific industrial training for technicians and for science and engineering graduates; the Commonwealth Experts Group, in its final report 'Towards a New International Economic Order', compiled in March 1977, and the Commonwealth Team of Industrial Specialists, in a progress report made a month later, both stressed the need for the transfer, diffusion and development of technologies and entrepreneurial and management skills appropriate to developing countries, and for interchanges of knowledge and experience between developed and developing countries and between developing countries themselves as means of achieving this.
4. Most important of all, the 7th Commonwealth Education Conference, held at Accra, Ghana, in March 1977, called for a Commonwealth programme of industrial training and experience to be worked out in detail for consideration by member governments. To that end, the Conference further recommended that the Commonwealth Secretariat should set up a Working Group to explore the feasibility and modus operandi of such a programme, on a basis analogous to that of the Commonwealth Scholarship and Fellowship Plan.
5. Pursuant to that recommendation the Secretariat has established a Working Group with the following terms of reference:
  - 5.1 To make recommendations to the Commonwealth Secretary-General, for consideration by Commonwealth Governments, on the feasibility and modus operandi of a Commonwealth Industrial Training and Experience Programme. In carrying out this task the Working Group will consider, inter alia,
    - 5.1.1 the detailed proceedings and reports of the Commonwealth conferences and meetings related to this subject;
    - 5.1.2 existing provisions under bilateral, international and other arrangements to meet the needs for increased opportunities for practical training and experience in industry;
    - 5.1.3 methods of financing a Commonwealth programme, including such items as administration, accommodation and transportation; and
    - 5.1.4 the national and Commonwealth machinery and facilities required for implementation of such a programme.

- 5.2 The main objectives of the programme would be:
- 5.2.1 the creation of opportunities for students and other trainees to receive practical training and/or work experience in the industries of Commonwealth countries; and
- 5.2.2 the provision to selected individuals of awards, which would also cover costs of travel and other necessary expenses, funded from various sources, including governments and the Commonwealth Secretariat (through the CFTC).
6. The programme would be designed to tap resources additional to those already utilised and to help systematize a sector of education and training for which inadequate provision is being made. It would also have the broader objectives of contributing to the transfer and development of technology appropriate to developing countries and of stimulating industrial cooperation between Commonwealth countries.
7. In defining the dimensions and scope of the proposed programme, the Commonwealth Secretariat has suggested that account should be taken of the following aspects:
- 7.1 Subject area: To be acceptable to governments a Commonwealth scheme should concentrate on a subject area in which practical training or experience complementary to formal courses of education are not only valuable but essential: such an area would be technology in general and engineering in particular.
- 7.2 Industries: For the purpose of the programme, therefore, industries should be those which are engineering-based and technology-based: high priority should be given to manufacturing industries (including allied maintenance and service sectors), but the programme should also include provision for training and experience in the technological content of other industries, e.g. mineral and agricultural production, construction and other infra-structure development activities, including public utilities.
- 7.3 Students and other trainees: These should normally be at either technologist or technician level, be undergoing or have completed formal courses of education at one of these levels, and be preparing for specific jobs or jobs in a specific category.
- 7.4 Training or experience: This should be a process undergone in properly organised and supervised conditions, strictly relevant to the needs of the nominating country, of a specialist or job-specific nature, and complementary to a formal course of education. Where such training and experience cannot be obtained in the student's or trainee's home country it should whenever possible take place in a country with a comparable industrial and social environment. The programme should therefore give a priority to movements among Commonwealth developing countries. However, as the more highly developed countries are sometimes the only ones in which the relevant training and experience can be obtained, they too have a vital role in any such programme. Similarly, two-way movements between Commonwealth developed countries and from developed to developing countries would also be beneficial.

## Commonwealth Secretariat

8. Following the wishes of the Commonwealth Education Ministers, the Commonwealth Secretariat has given a high priority to technical education and industrial training. In 1966 the Secretariat organized a Commonwealth Conference on the Education and Training of Technicians. (1) Taking their lead from this Conference, and endorsing its recommendations, the Fourth and Fifth Commonwealth Education Conferences gave a more specific remit to the Secretariat to develop activities in support of technical education. The practical training of technicians in industry and the training of technical teachers are two areas in which the Secretariat has investigated a generally inadequate provision of facilities.

9. The Fifth Commonwealth Education Conference in 1971 recommended that the Secretariat should study the problems of finding practical training for students. The first part of the study was carried out by Mr. F. H. Woodrow, former Engineering Adviser, Ministry of Overseas Development, (2) and this dealt with the situation in Britain.

10. This was followed by a survey of the countries of Asia by Mr. R. Dasgupta, Deputy Director of Technical Education, Madhya Pradesh. (3)

11. The survey covered Bangladesh, Hong Kong, India, Malaysia, Singapore and Sri Lanka. A section of each country surveys the arrangements for technician training (with reference also to the training of technologists) and includes statistics of output of technicians related to manpower needs. It forms a valuable and up-to-date information source, in relation to CITEP.

12. The Dasgupta survey makes a number of recommendations (pp4 - 5) which include:

12.1 The introduction of sandwich courses for as high a proportion as possible of the admission capacity of technical and technological institutions; which should be sponsored by industry.

12.2 The introduction of an "exchange programme" between the countries of the Commonwealth for technical teachers and industrial experts.

13. In 1974 the Secretariat commissioned Mr. A. MacLennan, former Principal of the Huddersfield College of Education (Technical) and host to the 1966 Expert Conference, to write a book (4) which would develop and up-date the thinking of that Conference.

14. The Secretariat also saw the need to provide key personnel in this area with opportunities to exchange views, examine pressing needs and problems, and identify possible solutions. The Hong Kong Government kindly offered to host a seminar for the Commonwealth countries in the two regions of Asia and the Pacific

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(1) The Education and Training of Technicians - Report of a Commonwealth Expert Conference at the College of Education (Technical), Huddersfield, October 1966 (CELC HMSO).

(2) Industrial Training of Students from the Developing Countries of the Commonwealth - F. H. Woodrow - Commonwealth Secretariat - 1973.

(3) A survey of Technician Training in Commonwealth Countries of Asia - R. Dasgupta - Commonwealth Secretariat 1976.

(4) Educating and Training Technicians - A. MacLennan Commonwealth Secretariat - 1975.

and this Seminar/Workshop "Technical Education Industry" was held in Hong Kong from 28 September to 7 October 1976. (5)

15. In the area of Commonwealth and Regional Co-operation, the following were among the recommendations and conclusions:

- 15.1 Greater provisions should be made for awards for study visits between Commonwealth developing countries in the two regions with reference to industrial training in general and apprenticeship training in particular;
- 15.2 Support should be given to assist staff development and exchange programmes for further training in Commonwealth countries in the regions;
- 15.3 Training and other forms of association between technical institutions in the regions should be encouraged in order to maximise the utilization of expertise and facilities;
- 15.4 A standing conference of persons involved in technician education and training on a regional basis should be established to enable them to meet on a regular basis for finding solutions to common problems.

#### The Commonwealth Fund for Technical Co-operation (CFTC)

16. The CFTC established in 1971 is an inter-governmental, multi-lateral development fund administered by the Commonwealth Secretariat. Through the fund, technical assistance is available to Commonwealth developing countries to assist them in meeting their national development priorities. It is supported by voluntary contributions from all Commonwealth governments. The programme aims to finance education and training of personnel from one developing Commonwealth country in another developing Commonwealth country.

17. The Education and Training Programme - one of the three programmes - has industrial development, including small-scale industries and work experience, as one of its ten priority fields of study. Examples of fields for which awards have been made between 1972 and 1976 for training attachments are: agro-meteorology, artificial insemination, banking, fisheries, industrial hygiene, insurance, logging operations, medical records, mines safety and explosives, museums, pig production, pilotage, price control, seamen's employment, school administration, stored products technology. (6)

18. In a note prepared for the meeting of the Team of Industrial Specialists in November 1977 it is pointed out that to date most of the programme has been directed towards the agricultural, but in future more attention will be given to the industrial sector. The note states that a major element in industrialisation concerns the development of an enlarged and enhanced entrepreneurial capacity in developing countries. It is generally recognised that benefits would accrue from 'exposure visits' or 'study tours' in other countries in order to allow potential entrepreneurs to see industrial development elsewhere, a device which could be particularly useful in the case of small scale industries. The CFTC

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(5) Technical Education and Industry - Report of Commonwealth Regional Semi Seminar/Workshop Hong Kong 28 September - 7 October 1976 - Commonwealth Secretariat 1977.

(6) Information leaflet CFTC - Education and Training Programme - February 1977.

could finance exchanges of personnel for this purpose although in its initial stage any such scheme would have to be of a small size and on a trial basis.

### Commonwealth Science Council (CSC)

19. On the recommendations of the 8th CSC Meeting in Zambia in 1974, the Secretariat of the CSC carried out a survey to study the feasibility of a Commonwealth industrial training programme. The results of the survey were presented to the 9th CSC Meeting in Sri Lanka from 29 November to 10 December, 1976. The Meeting agreed that a programme could meet a vital need and should be commended to the Education Division of the Commonwealth Secretariat. As a result the CSC was invited to present a paper to the Seventh Commonwealth Education Conference (7 CEC/BP/2/1); and the following is the text of the paper:

#### Industrial Training Programme Presented by the Commonwealth Science Council

- 19.1 "There are many schemes in operation to promote and improve training in science and technology. These have tended either to be academic or geared to meet general national manpower needs. Two areas have not received sufficient attention: project-oriented programmes and industrial fellowships.
- 19.1.1 Project-oriented training. With implementation of plans for the establishment of new industries or the construction of some large-scale public works, there is a need for specialist manpower. It ranges from mechanics to maintain sewing machines for the garment industry to the upgrading of the skills of a good Public Works Engineer in order that he can accept Project Management responsibility.
- 19.1.2 Industrial Fellowship. The growth of Faculties of Science and Schools of Engineering in Commonwealth countries has been a significant development over the past twenty-five years. Unfortunately, these young graduates move into an industrial environment where there is lacking a large resource of technological experience. A 'sink-or-swim' attitude develops more often than not, leading to frustration and the inevitable brain-drain. It would appear that a well-organized scheme of industrial fellowships in which selected recent graduates in science and engineering can be exposed to practices and procedures in a more technologically developed environment can have appreciable benefits. Attachments to specific manufacturing, consulting, contracting and utility establishments as well as to research and development laboratories could form the core of such activity.
- 19.2 With these areas in mind, a survey was undertaken by the Commonwealth Science Council to study the feasibility of a Commonwealth Industrial Training Programme. The survey was so designed to elicit information on existing project-oriented courses in developing countries, national coordination of such training, courses and attachments suitable for outside participants, possible topics for ad-hoc regional courses, and the need for expert-level regional workshops to further define the programme. The results of the survey indicated that consideration needs to be given to the following:
- 19.2.1 establishment of infrastructure in member countries to organize and coordinate national training programmes and to liaise with external bodies;
- 19.2.2 mode of financing the Programme, the options being either setting

up a special CSC training fund or incorporating the Programme under existing bi- and multi-lateral assistance schemes e.g. Colombo Plan, Commonwealth Fellowship Programme, technical assistance schemes under the CFTC, ODM, CIDA;

- 19.2.3 convening expert-level regional workshops to define further specific regional training needs and to propose adequate measures to meet these needs;
  - 19.2.4 organizing by the CSC and other external multilateral agencies regional training programmes in specific areas of need identified;
  - 19.2.5 the role of CSC in formulating and implementing the programmes, particularly in liaising with other multilateral agencies;
  - 19.2.6 the geographical extent of exchange of trainees and fellows.
- 19.3 The Council considered the survey report at the Ninth CSC Meeting in Colombo, Sri Lanka, November-December 1976. Council noted with satisfaction the enthusiastic response to the survey questionnaire and the offers of support to the possible Programme. Delegates confirmed the survey findings which show forcibly that a valuable purpose would be served if such a Programme is operated at the Commonwealth level. It was agreed that much would be achieved if stimulation was given to the establishment of machinery in member countries to arrange national training programmes. There is a dearth of information on where non-formal training and attachments could be arranged in different industries, and a worthwhile task would be performed if information from member countries is collated, including the number of trainees that can be accepted. The survey went some way to obtaining this information, particularly from developing countries.
- 19.4. In order to avoid duplication and to make the most effective use of limited resources, the Council commended the Programme to the Education Division of the Commonwealth Secretariat and other national and multi-lateral agencies active in this field.

20. Countries whose replies are summarized in the survey are: Cyprus, Ghana, Guyana, Kenya, Malawi, Mauritius, Nigeria, Singapore, Trinidad and Tobago, Uganda, Australia, Canada, New Zealand and the United Kingdom also replied."

21. The summaries of replies to the questionnaire which provide much useful information relevant to the considerations of the Working Group consist of the following tables (copies of which appear as Appendix D)

Table 2 - National Co-ordination of Non-formal Industrial Training Programmes in Developing Commonwealth Countries.

Table 3 - Present Deficiencies in Existing National Industrial Training Situations in Developing Commonwealth Countries.

Table 4 - Existing Project - Oriented Training Courses in Developing Commonwealth Countries in which Participants from Other Countries in the Region Could be Accommodated.

Table 5 - Suggested Topics by Developing Commonwealth Countries for Organising Courses on a Regional Basis, to Meet Regional Needs by External Multi-lateral Agencies.

## THE COLOMBO PLAN

12 Melbourne Avenue,  
P.O. Box No. 596,  
Colombo (4),  
Sri Lanka (Ceylon).

22. The Colombo Plan for Co-operative Development in South and South-east Asia came into full operation on 1 July 1951. Those Commonwealth countries which are members are: Australia, Bangladesh, Britain, Canada, Fiji, India, Malaysia, New Zealand, Singapore, Sri Lanka and Papua New Guinea.

23. A wide variety of courses is available under the aegis of the Colombo Plan. All arrangements are made on a bilateral basis. In 1975 4,284 new places were provided for trainees by donor countries (Australia, Britain, India, Japan, New Zealand, Pakistan, Singapore, USA), including those in the following sections:

Industry	585	(266 to Commonwealth countries)	
Public utilities	399	(186 to Commonwealth countries)	
Trade	115	(61 to Commonwealth countries)	(7)

24. Examples are: India provided training places for Malaysia in packaging, for Singapore in industrial safety, and for Sri Lanka in sugar technology. Japan accepted trainees from Singapore and Sri Lanka for six months training in ceramic glaze and decoration; and trainees from Bangladesh and Sri Lanka for six-month courses in metal finishing engineering. The Bank of Canada provided facilities for a trainee from Bangladesh to follow a course in banking for one month. India provided training in statistics for students from Bangladesh, Fiji, Singapore and Sri Lanka. An Indian trainee received six months training in Britain in electrical engineering and applied technology at GEC Traction Ltd, Manchester. Canada sponsored four trainees from Bangladesh for eight-month courses of training in electric power and a trainee for a 13-month course in hydro-electric power stations, at the New Brunswick Electric Company. The Department of Civil Aviation, Singapore provided facilities for a leading fireman attached to the Bandaranaike International Airport, Sri Lanka, to follow a three-month course of training in aerodrome fire fighting. A Superintendent from Sri Lanka Port (Cargo) Corporation followed a three-month course in port administration and traffic control under the auspices of the Port of Singapore Authority.

### Evaluation of International Training (8)

25. A Conference on the Evaluation of International Training under the Colombo Plan was held in Sri Lanka from 27 September to 1 October 1976. The

(7) Report of the Colombo Plan Council for Technical Co-operation in South and South East Asia - December 1976.

(8) Report on the Conference on Evaluation of International Training under the Colombo Plan 27 September to 1 October 1976 Sri Lanka Colombo Plan September 1976.

Conference agreed to introduce a new form for the application and nomination of candidates for training; to undertake a pilot evaluation study limited to five countries; and to consider producing compendia of formal training courses in a standard format.

26. The conference also considered the special problems posed by the widespread demand for practical experience. The problems experienced by donor countries in seeking practical attachments were fairly similar. The major problems were:

- 26.1. The high cost, at times prohibitive, involved in arranging attachments with industry, in particular arising from high charges demanded by firms for providing such a service.
- 26.2. Certain trade unions, for various reasons, objected to foreign trainees being given practical attachments in their industry.
- 26.3. Some firms were unwilling to risk revealing their trade secrets.
- 26.4. In general, the standard of English of candidates proposed for practical attachments was lower than that of those proposed for academic courses.

27. There were, of course, other problems. For example, inadequate consultation between donors and recipients had resulted, at times, in the wrong sort of practical training being provided. Reluctance on the part of trainees to undertake manual labour may also create problems for donor governments in arranging future training programmes.

28. Possible ways to tackle these problems were suggested by the delegates. One suggestion was to allocate more resources for building up technical institutions in the region and hopefully thereby reducing the need for practical attachments.

29. As regards practical attachments in third countries, it was suggested that the recipient government and third country organisations should correspond directly with each other, once agreement to the attachment had been reached by all concerned.

30. Whatever the difficulties involved in practical attachments might be, the need for practical attachments was considered of great and increasing importance by recipient countries. Where cost was a problem, then this should be discussed between donor and recipient countries and a decision made on relative priorities.

## EUROPEAN ECONOMIC COMMUNITY (EEC)

Brussels  
Belgium

31. The ACP-EEC Convention of Lomé which came into force in 1976, was designed to establish a new model for relations between developed and developing states, compatible with the aspirations of the international community towards a more just and balanced order. There are now in membership 52 African, Caribbean and Pacific countries (ACP) and the nine Community States. All Commonwealth African and Caribbean countries are members, also Mauritius, the Seychelles, Western Samoa, Fiji, Tonga, and Papua New Guinea. Funds for technical co-operation, including industrial and vocational training, are

provided from the European Development Fund. The Lomé Convention attaches special importance to the industrial development of the ACP states. Projects are concerned with infra-structure (transport, communications, energy), also with the processing of raw materials, establishing factories for finished or semi-finished products, training and promotion. The Committee for Industrial Co-operation and the Centre for Industrial Development - joint EEC - ACP bodies - are concerned to encourage European firms to participate in the execution of specific industrial projects and the development of small and medium-sized firms in the developing countries. (9) (10) (11)

The International Association for the Exchange of Students for Technical Experience (IAESTE)

Ramistrasse,  
8092 Zurich,  
Switzerland. (12)

32. IAESTE is a non-political, non-governmental organization having consultative relationship with UNESCO, UNIDO, ILO and the Organization of American States. The aims of IAESTE are: to provide students at institutions of higher education with technical experience abroad relative to their studies in the broadest sense; and to promote international understanding and goodwill amongst the students of all nations. IAESTE is composed of national committees of 46 member countries which are responsible for exchanges in their own countries. Each member country collects offers from industrial and other organizations for receiving students from abroad for a temporary training period. The offering companies or organizations are expected to make students a payment sufficient to enable them to cover their cost of living during the actual training periods. The offers are exchanged with other member countries on a reciprocal basis. IAESTE is financed by membership subscriptions of S.Fr. 9 for every student sent abroad the previous year. There are at present 46 member countries including the following Commonwealth countries: Australia, Canada, Ghana, India, Malta, Nigeria and the United Kingdom.

33. The following table shows numbers sent and received by those countries in 1977 and between 1948-77:

	1977		1948-77	
	Sent	Received	Sent	Received
Australia	9	8	50	35
Canada	78	71	719	1619
Ghana	12	4	87	18 (1970-77)
India	-	-	120	106 (1955-77)
Malta	1	-	51	30
Nigeria	-	-	-	6 (1976-77)
United Kingdom	191	116	17269	17997

(9) Lomé Dossier - EEC Brussels March 1975.

(10) The ACP-EEC Convention of Lomé. One year after its entry into force Information Note P29 - EEC Brussels March 1977.

(11) The Lomé Convention - A Year's Work - Background Report IS EC/1334/77 - EEC London May 1977.

(12) IAESTE 30th Annual Report 1977 - IAESTE Zurich Switzerland.

34. From Ghana students went to Germany (4), Netherlands (2), Sweden (2), Switzerland (2). Ghana received students from Denmark (1), Netherlands (2), Switzerland (1). Various factors resulted in only 60% of the offers being utilised. Kumasi Breweries Ltd. and the Ashanti Goldfields Corporation were among the co-operating organizations.

35. Even though their own countries are not IAESTE members, some Commonwealth students benefit from the programme because they are studying in a member country. For instance students from Kenya, India, Bangladesh, Sri Lanka and Malaysia were received by Germany in 1977.

International Association for Students of Economics and Management (AIESEC)  
 45 Avenue Legrand  
 B-1050 Brussels  
 Belgium. (13)

36. AIESEC, whose headquarters are in Brussels, is organised on similar lines to IAESTE. Its purpose is to further the education of economics and management students by placing them in management traineeships abroad. The principal difference lies in the high proportions of graduate students (about 80%) selected for AIESEC traineeships. AIESEC has 55 member countries including the following Commonwealth countries: Australia, Canada, Ghana, Hong Kong, India, Kenya, Malaysia, Malta, Nigeria, Sierra Leone, Singapore, United Kingdom.

#### UNITED NATIONS (14)

37. During the biennium 1973-74, organizations and agencies of the United Nations system awarded a total of about 21,500 fellowships at a total cost of a little over 90 million dollars.

38. The breakdown by organizations is as follows:

<u>Organization</u>	<u>Expenditure</u> \$	<u>Number of Fellows</u>
WHO	30,172,600	7,359
UNESCO	11,004,482	2,161
FAO	10,818,000	1,481
UN	10,254,340	3,200
ILO	8,636,242	901
IAEA	4,476,954	1,552
UNIDO	3,917,000	1,334
WMO	2,854,000	538
ITU	2,506,824	1,140
UPU	717,550	235
UNEP	693,000	137
IMCO	223,564	121

(13) AIESEC Great Britain - Annual Report 1976 - 77 and Information Leaflet - AIESEC GB - 43 Dorset Street, London, W1H 3FN.

(14) Report on Fellowships in the United Nations System by C.S. Jha, Inspections Unit, United Nations, Geneva (UN General Assembly 31st Session - A/31/101 June 1976)

39. UN Fellowships fall into three main groups:
- 39.1. for individual academic study;
  - 39.2. for attendance and short individual or group tailor-made practical training courses, seminars, symposia, workshops, in-plant training etc.
  - 39.3. for participation in individual or group study or observation tours, which enable senior officials to examine relevant developments abroad, exchange views and gather information.

40. In general, most fellowships are components of UNDP - funded or similar technical co-operation projects. UNDP funded in the biennium 1973-74 about 50 per cent of all awards.

41. All or most organizations of the system have helped establish or are assisting, in many countries of all regions, national training or research institutions. The organizations concerned principally in industrial training are the International Labour Office (ILO) and the UN Industrial Development Organization (there is however an element of industrial training in the programmes of all or most of the organizations). From the information available it has not been possible to produce statistics on industrial training nor on the numbers of UN fellowships from Commonwealth countries. Some statistical information is provided in the sections which follow on ILO and UNIDO.

INTERNATIONAL LABOUR OFFICE (15)

CH 1211,  
Geneva 22,  
Switzerland.

42. ILO's programmes are essentially employment-oriented, with the emphasis being placed on immediate employment opportunities. Among the training centres established by ILO, and one which attracts a particularly large number of high-level fellows, is the International Centre for Advanced Technical and Vocational Training at Turin (Italy). The Centre's primary activity is to organize advanced training courses at post-experience level for heads and supervisory staff of training institutions, training officers and instructors engaged in vocational activities, middle and senior managers in private and public industrial, commercial, agricultural and service enterprises, and for trade union officials. Since the centre's inception over 11,000 fellows from over 145 countries have participated in its training activities.

43. The number of participants from Commonwealth countries between 15 October 1965 and 31 July 1977 was 1,534 and in 1977 144.

The numbers, by countries, are set out on the following page.

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(15) Information Brochure - International Centre of Advanced Technical and Vocational Training - Turin (EXREL/Ed. 1/1977) and supplementary information supplied by ILO.

	1977	1965/77		1977	1965/77
Antigua	1	2	Mauritius	2	22
Australia	1	8	Montserrat	-	1
Bahamas	-	5	New Zealand	-	2
Bangladesh	8	23	Nigeria	13	162
Barbados	3	5	Papua New Guinea	-	8
Bermuda	1	1	Seychelles	-	24
Botswana	-	26	Sierra Leone	1	38
Canada	1	25	Singapore	5	61
Cayman Islands	-	1	Sri Lanka	16	98
Cyprus	1	58	St. Kitts	1	1
Dominica	1	3	St. Lucia	-	3
Fiji	-	4	St. Vincent	-	1
Gambia	1	8	Swaziland	-	16
Ghana	5	90	Tanzania	8	176
Grenada	1	1	Trinidad and Tobago	3	21
Guyana	3	62	Uganda	33	222
Hong Kong	-	15	United Kingdom	6	102
India	12	185	Zambia	1	56
Jamaica	4	61			
Kenya	6	125	Totals	<u>144</u>	<u>1,534</u>
Lesotho	-	7			
Malawi	-	2			
Malaysia	8	89			
Malta	-	14			

44. Each programme provides for a large number of study visits both to Italian organizations and also to organizations and institutions in other countries, e.g. Britain and France. Participants in course at the Turin Centre may be financed from other sources than ILO e.g. other U.N. agencies and organizations, individual governments, individual organizations - industry, trusts, etc.

## UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

P.O. Box 707,  
A-1011,  
Vienna,  
Austria.

45. The Secretariat of UNIDO was restructured early in 1976. One result was that the capacity of UNIDO to carry out industrial training was strengthened by concentrating the responsibility for all activities in this area in the Training Section of the Industrial Operations Division. The section is thus in a better position to fulfil the mandate for the "intensification of manpower development programmes and the professional training of management staff" that UNIDO was given at the Second General Conference of UNIDO in Peru in 1975.<sup>(16)</sup> In principle the goal of UNIDO training operations is to improve the skills and broaden the experience of high-level technical, managerial or administrative personnel engaged in industry and in agencies, organisations and institutions dealing with its development.

46. The UNIDO Industrial Training Offer Programme (17) addresses itself mainly to personnel at least at engineer level or equivalent. UNIDO does not normally deal with vocational training or with formal education to obtain a degree. UNIDO emphasises practical training (in-plant or on-the-job); upgrading or updating of professional skills; transfer of technological and managerial know-how, with a view to enlarging the capacity for making the right choice of technology and equipment; co-operation among developing countries in industrial training; and assistance to the least developed among the developing countries.

47. Since 1968, approximately 4,650 individuals have been awarded fellowships of whom approximately 4,100 had completed their training by 1976. UNIDO is placing an increasing number of individual fellows in suitable industrial training facilities in advanced developing countries. To this end, UNIDO is prepared - partly with the support of industrialized countries - to assist potential host training countries among the developing countries in identifying local training facilities suitable for trainees from other developing countries and, if necessary, in adapting such facilities to that purpose.

48. UNIDO organizes in-plant training programmes for engineers and advanced technical and managerial personnel from developing countries in co-operation with the Governments of host countries. In 1977 29 programmes each of three months were arranged including maintenance management (Sweden), textile industry (Poland), metal-working industry (USSR), maintenance of buses and trucks and of railroad equipment (Belgium), diesel engineering (Czechoslovakia), production management (Japan). This last named course from October - December 1977 was attended by engineers from 10 countries including Bangladesh, Cyprus, Guyana, Hong Kong, Singapore, Sri Lanka and Tanzania.

49. The UNIDO "Guide to Training Opportunities" is divided into four sections. The first section, "UNIDO in-plant group training programmes", includes such hosts as the Central Food Technological Research Institute, Mysore (the only Commonwealth example), the Ministry of Chemical Industry, Moscow, and Belgian Railways. "Training opportunities offered by institutions other than UNIDO (branch-oriented)" include courses in cement production in Rome,

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(16) Information Paper P1/57 8 November 1976 - UNIDO.

(17) Guide to Training Opportunities for Industrial Development Fifth Issue - UNIDO October 1976.

in ceramics in Stoke-on-Trent, in plastics technology at the Hong Kong Productivity Centre, in the manufacture of heavy electrical equipment at Bharat Heavy Electricals Limited, Bhopal, in meat industry technology and management in Sweden, in sugar cane technology in the University of Mauritius, and in welding at the Welding Research Institute, Bratislava.

50. Examples of "Training opportunities offered by institutions other than UNIDO (function-oriented)" are courses in information storage and retrieval at SENDOC, Hyderabad, in maintenance management and technology at the International Centre, Turin (see ILO, above,), in management services techniques at the Institute of Public Administration, Dublin, and in several areas of small industry at SIET, Hyderabad. The fourth and last section, "Other training opportunities and short courses" includes a 2-week course in textile testing (fabrics) in Alexandria, 4-day management courses with the Hong Kong Management Association, a 1-week materials management course at the National Institute of Management, Sri Lanka, and a 5-day course in timber drying with the Timber Research and Development Association, High Wycombe, England.

#### ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC (ESCAP)

Sala Santitham,  
Bangkok 2,  
Thailand.

51. ESCAP is one of the four regional economic commissions of the United Nations. Its purpose is to assist in the development of 31 member and 8 associate member countries in its region. Its activities include: conducting and supporting research in science and technology; and increasing opportunities for training including the establishment of regional training centres.

52. ESCAP publishes a handbook which provides information on training facilities available in the developing countries of the region with a view to securing their better utilization by other developing countries. (18) It covers training courses at the operational level (but does not include academic courses) in the following countries: Bangladesh, India, Malaysia, Singapore, Sri Lanka; foreign - Afghanistan, Indonesia, Iran, Nepal, Pakistan, Philippines, Republic of Korea, Thailand, Trust Territory of the Pacific Islands.

#### WORLD ASSOCIATION OF INDUSTRIAL AND TECHNOLOGICAL RESEARCH ORGANIZATIONS (WAITRO)

53. WAITRO is an association of non-profit research institutes. Its membership in 1976 covered 50 developing and 25 advanced countries. The WAITRO training programme was set up in 1972, financing being provided by CIDA. In 1976 training had been carried out exclusively in industrial plants in eight training projects; industrial research institutes have been used mainly for the remaining 13 projects. Nine candidates had completed training including one from SIRIM (Malaysia), two from EAIRO (Kenya), and three from FIIR (Nigeria). (19)

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(18) Training Courses Available in Developing ESCAP Countries - ESCAP February 1976.

(19) WAITRO - Proceedings of Third Biennial Meeting - October 1976.

## NATIONAL SECTION

54. The following notes on the provision of industrial training and experience in a selection of Commonwealth countries are by no means comprehensive. They are intended to provide some indication of the present position.

### AUSTRALIA

55. Training for qualified technicians is provided mainly at Government technical colleges and at colleges of advanced education in formal courses. Private industry has no co-ordinating body that provides further training for qualified technicians. Most of this training is specific to a particular company or industry and is usually developed to meet particular needs as they arise.

56. The major thrust of Australia's technical co-operation programme, which is administered by the Australian Development Assistance Agency (ADAA), is directed towards training more highly qualified people who would on their return home train others. In arranging practical training for people from overseas, considerable problems have been encountered in industrial relations and there is a reluctance by employers to accept non-productive trainees.

57. International training courses have for many years been a feature of Australia's foreign aid programme. Most participants are middle-level or senior officers in Government employ in their own countries. Each course lasts approximately three months and is designed for between 15 and 20 participants. With some courses, an opportunity is provided to undertake practical on-the-job training. For instance, a course on industrial relations conducted by the International Training Institute, Sydney, from September to December 1977 includes two separate attachment periods to allow course participants to observe the current industrial relations environment and to relate techniques, where relevant, to operations in their home countries. A course on export development for private businessmen from September to November 1977 (to be held also in 1978) aims to train 16 to 18 executive businessmen from South and South-East Asia in the overseas trade developed by Australian industry and trade. The course includes visits to industrial, commercial and Government organizations. A course on minerals exploration from August - October 1977 was designed for exploration personnel at the senior technical level, including mining engineers, geologists and geophysicists. The course included extensive travel throughout Australia for the purpose of examining the practical aspects and operations of the industry in Australia. (20)

58. In 1976 there were 2,552 students and 1,443 trainees (average stay about five months) from developing countries in Australia financed under official programmes. There were also 7,500 private students; most of them came from developing countries. (21)

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(20) Special Group Courses 1977-78 and for 1978-79 - Australian Development Assistance Bureau.

(21) Australia's Official Development Assistance to Developing Countries 1977-78 - Budget Paper No. 8 - Australian Government Publishing Service, Canberra 1977. Commonwealth Science Council Survey.

## BANGLADESH

59. The Dasgupta Survey (pp 8-13) (3) describes the organization of technician education and training in Bangladesh. On future needs it states: it is apparent that the Apprenticeship Rules now in force in Bangladesh are inadequate. The country requires as many training places for practical training in industry as the number of graduates and technicians admitted annually, i.e. 560 and 3,300, or failing that, at least half that number. This is considered necessary in view of the need for practice-oriented courses and experienced personnel.

## CANADA

60. The Canadian International Development Agency (CIDA) is responsible to the Canadian Parliament through the Secretary of State for External Affairs for the administration of the Canadian Government's programme of assistance to developing countries. CIDA places trainees in a wide variety of training programmes. Such programmes include engineering, business administration skills, mechanical trades, construction trades, and may involve both a formal component (placement in training institutions) and in an informal component (practical training attachments to industry). The programmes may also consist of "in-house" training in a private or public enterprise.

61. Specific requests are channelled through CIDA which acts as a co-ordination point for the placement of trainees from developing countries. The placement service offered by the Human Resources Division of CIDA are:

61.1. Assessment of the qualifications of candidates and discussion of candidates' training requirements with advisors (in relevant government departments, industry, universities, training institutes) to establish programme possibilities;

61.2. Identification of Canadian organizations with regard to their potential and ability to provide training required (in both public and private sector);

61.3. Carrying out of administration necessary to ensure optimum training environment for trainee (e.g. negotiation of admission, arranging accommodation, advising institution of travel plans, etc);

61.4. Planning and arrangement for summer training programmes and practical training attachments, as appropriate;

61.5. Review of progress of trainees during duration of their training so as to make any necessary programme changes required to optimize the utilization of the Canadian training facilities.

62. In 1976 there were 1,540 students and 146 trainees (with an average stay of about eight months) from developing countries in Canada financed under official programmes. In 1973 there were 54,453 foreign students including part-time students enrolled in institutions of higher education in Canada. (22)

Source: Commonwealth Science Council Survey.

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(22) Statistics of Students Abroad 1969-1973 UNESCO, Paris, 1976.

## CYPRUS

63. In their reply to the CSC survey, Cyprus stated that it would be of great assistance if Cypriots were exposed to an advanced industrial experience for a period of 6-12 months; but that it was very unlikely that similar opportunities could be granted in Cyprus to fellows from abroad. Most of the industrial units in Cyprus are small-scale.

Source: Commonwealth Science Council Survey.

## GHANA

64. There is no national co-ordination of non-formal industrial training programmes in Ghana. Although the training requirements of the public sector industries are looked after by training inside the country, there is little or no provision for training personnel of the private sector industries. Industrial areas in which placement could be offered by Ghana are wood technology and management (2-year postgraduate course); one year post-graduate courses in various aspects of road-building and building construction.

65. Ghana is a member of IAESTE and of AIESEC.

Source: Commonwealth Science Council Survey.

## GUYANA

66. There is stated to be a need for more co-ordination in the provision of technical education at the national level in Guyana. Individual industries do not normally provide in-house training. Some placements might be made available to trainees from other countries, e.g. for joinery, logging and saw-milling, by the Guyana Forest Industries Corporation. The Guyana Sugar Corporation might also be able to provide training facilities.

Source: Commonwealth Science Council Survey.

## HONG KONG

67. Practical training is the concern of the Hong Kong Training Council and ten industry training boards have been set up under the umbrella of the Training Council. There is a close relationship between industries and technical education in that the technical educational institutions are constantly reviewing their curricula and syllabuses to cater for the needs of industries, which are rapidly changing and advancing and becoming more sophisticated. At the same time industries take on undergraduates from these institutions during the summer vacations to enable them to obtain industrial experience.

68. The Hong Kong Air Craft Engineering Co Ltd (HAEC) runs a training centre which provides training at both craft and technician level. The school is one of the biggest establishments in the South Asia region, and perhaps the only one of its kind.

69. Where facilities and other related studies are considered to be locally inadequate the Hong Kong Government will undertake to send scholars overseas to acquire appropriate training and skill.

70. In 1975/76 there were 4,434 Hong Kong students in Britain, all with the knowledge and many with the sponsorship of the Hong Kong Government. The same year about 4,000 Hong Kong students went to Canada - three times as many as to Britain - and about 2,600 to the United States. It can be deduced from UNESCO

and British Council statistics that between a quarter and a third of these totals were studying engineering or technology. A high proportion of such students in Britain probably, in one way or another, received some practical training or experience in British industry, but most of it will have been basic or general.

71. Dr The Hon. S.Y. Chung, Senior Unofficial Member of the Hong Kong Legislative Council, in his opening address to the 1976 seminar stressed the importance to his country of improving its industrial productivity through mechanization of its existing industries as well as the development of more sophisticated and technologically advanced industries. There was still a lack of training facilities and technical education opportunities in Hong Kong. He described technical education without industrial training as "just like a half-baked potato".

## INDIA

72. India is a major provider of education and training for students and trainees from other countries. Statistics issued by the Ministry of Education and Social Welfare (23) show that in 1974-75 there were 7,793 students from other countries studying at Indian universities and institutions. About half (3,615) were from other countries of the Commonwealth as follows:

<u>Africa</u>		<u>America</u>	
East Africa (countries not specified)	50	Canada	14
Ghana	9	W. Indies	11
Kenya	433	<u>Asia</u>	
Malawi	77	Sri Lanka	323
Mauritius	535	Malaysia	1,450
Nigeria	53	Singapore	51
Rhodesia	1	<u>Oceanic</u>	
Tanzania	238	Australia	3
Tonga	16	Fiji	2
Uganda	15	<u>Europe</u>	
Zambia	75	U.K.	249
Zanzibar	10		

73. Numbers of foreign and Commonwealth students by subject are shown on the next page.

834

(23) Studies in Educational Statistics - No. 4 - 1977 Indian Students going abroad and Foreign Students in India - 1965-66 to 1974-75. Statistics and Information Division, Ministry of Education and Social Welfare, Government of India - New Delhi 1977.

Agriculture and Forestry	463
Commerce/Business Management	834
Education/Teacher training	101
Engineering and Technology	1,056
Humanities/Arts	2,123
Law	28
Medicine/Denistry/Nursing/Veterinary science etc.	1,313
Science	1,553
Others	322

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7,793

74. In India there are 284 polytechnics offering a variety of courses for the preparation of middle-level technicians and operatives required for various duties in industry, construction work, design and overall development. Specific job-oriented courses have come into being in a number of polytechnics. The aim of the technician education is, therefore, to relate theory with practice, to relate teaching to industrial experience and to highlight the need of co-ordination between the technical institutions and industry. A sandwich programme has been introduced in 44 of the 284 polytechnics. There is agreement about the effectiveness of this programme in equipping technicians with the general technician functions expected of them by industry and with the specific and particular functions required by those industries that collaborate with the polytechnic running the sandwich programme. There are, however, some polytechnics with no industries in the neighbourhood with which useful collaborative arrangements can be made, and some place where industrial development exists but no polytechnic.

75. Practical training is distributed into two periods of three months each in the first and second year and a period of six months after the final year examination. The training is supervised both by experts and training officers of the industry and by teachers of the technical institutions concerned. A regular assessment of training is made and due credit given to the students for purposes of final examination leading to the award of the Diploma in Engineering. In the state of Maharashtra all the diploma courses are being run as sandwich programmes. In-plant training for a period of twelve months is an integral part of the course. Out of the 44 polytechnics conducting sandwich programmes in India, 25 are situated in the Western Region (comprising Maharashtra, Gujarat, Madhya Pradesh, Goa, Daman and Diu). Out of the remaining 19, only three are situated in the Northern Region (comprising U.P., Punjab, Rajasthan, Haryana, and Jammu and Kashmir), which is the most important industrial belt and most densely populated area of the country.

76. Under the Indo-Soviet Credit Agreement, the Government of India initiated measures to identify specialized fields of technician training. This approach was part of massive efforts directed towards a meaningful diversification of diploma courses. High-level teams of Indian and Soviet authorities visited a number of polytechnics and held discussions with major industrial projects in this country. They identified the following main areas of specialization for which technician programmes should be developed: machine building; metallurgy of ferrous metals; oil and gas processing equipment; and electrical machine building. For further specialization and emerging technologies they listed: technology of machine building; mechanical working; welding techniques; metallurgy of ferrous metals; production of castings; production forgings and stampings; oil and gas field equipment; oil and gas processing industry, electrical machine building.

77. Model technician diploma courses were, therefore, started in four institutions. The programme of such courses envisages practical training in important industry in each of the regions in which these courses are being run. The duration of the course is therefore 3½ to four years. (During the practical

training of students in industry, they are paid a stipend of 150 rupees a month. The number of hours of training during the three-year institutional training is 3,456. Out of this, 1,190 hours, roughly 35% of the total work load, are for theoretical training, and the remaining 65% (2,266 hours) are for practical training.) The scheme has been found useful, and it is proposed to extend its scope so as to include in it a number of emerging technologies. A technical assistance agreement exists between the Government of India and the U.S.S.R.

78. India has also developed training facilities (18) which are relevant to the needs and problems of developing countries and embrace almost every branch of economic activity, many of which include periods of practical training. Examples of subjects covered are: boat building foremen course (Central Institute of Fisheries Operatives, Cochin and Madras), mines safety and mines development (India Bureau of Mines); plastics engineering/technology (Central Institute of Plastics Engineering and Tools, Madras); railway signal engineering and telecommunications (Indian Railways Institute of Signal Engineering and Telecommunications, Andhra Pradesh),

### KENYA

79. Co-ordination of non-formal industrial training is at an early stage in Kenya. It is the responsibility of the National Industrial Vocational Training Council (NIVTC) (Directorate of Industrial Training, Ministry of Labour) and the Management Training and Advisory Centre. The organization of small-scale industry is one area in which training might be given for trainees from other countries.

80. The Kenya Polytechnic has a system of employer-sponsorship for technicians which has many advantages, including the advantages of reducing or eliminating the problems of placement for practical training and experience and of integrating the academic and industrial elements of the course. One disadvantage may be that the system does not produce a "pool" of qualified technicians available to employers other than sponsors and another that it does not readily cater for non-nationals because these have no sponsors, or none on the spot; but these disadvantages may not be insuperable. The Polytechnic's description of the system reads as follows:

"To obtain full benefit of most of the courses offered at the Kenya Polytechnic, it is essential that a student should be in relevant employment.

Unlike most educational institutions, attendance is so arranged that a student continues in employment undergoing a programme of in-service training at his place of employment which is complementary to his course of training at the Kenya Polytechnic. Most courses of training are therefore on a 'sandwich' or 'day-release' basis, and for such courses employer-sponsorship is an essential entry requirement.

Employers become sponsors of students at Kenya Polytechnic by:

- (i) agreeing to release employees to attend scheduled classes at the Polytechnic
- (ii) by providing facilities for in-service training at the place of employment. In most cases employers also accept financial responsibility for tuition fees, books and equipment and, in some cases, for boarding fees."

81. The University of Nairobi has, in a different way, dispensed with part of the need for placing engineering students in industry by setting up its own production workshops in which industrial conditions are to some extent simulated.

## MALAYSIA

82. In Malaysia, preparation for employment begins with a two-year upper secondary course which is divided into vocational, technical and general education. Students in the upper secondary vocational courses are intended to fill the need for skilled labour while many of those from the upper secondary technical courses proceed to one of the two polytechnics, established in 1969 and 1976, or the University of Technology which provides 3-year courses as well as 5-year degree courses. Higher grade technicians for architecture and the building industry are among those also trained at the MARA Institute of Technology. Technologists are also trained at the University of Malaysia, the University of Technology and the University of Science in Penang. Few private companies have industrial training programmes, but the public sector has well-established programmes. The colleges of technology find it difficult to arrange practical training facilities for students.

Sources: (3) Dasgupta Survey (5) Hong Kong Seminar Report.

83. A country paper presented to the Hong Kong Seminar by MARA Institute of Technology on behalf of the Ministry of Education, Malaysia, contains the following significant section:

### 'Existing Co-operation Between Educational Institutions and Industry

Co-operation requires two-way communication. Industry needs skilled and trained manpower with sound educational qualifications. Educational institutions are supposed to provide the necessary education whereas industry is given the task of providing the more practical aspects of training.

Although educational institutions and industry has been working together for some time in Malaysia, the amount of co-operation that has so far taken place is minimal.

### Industrial Training

Private sector involvements in industrial training is negligible. Industrial training of any significant proportion is carried out in public sector establishments such as the Malayan Railway, the Public Works Department and the Department of Telecommunications.

Industrial training has been an integral part of the Diploma requirement for the first technical institution in Malaysia, the Technical College (now the University of Technology, Malaysia) since the 1950s. The students were required to complete at least one year of industrial training, either at the end of the second year or after the final examination of the three year full-time diploma course. In those early years the majority of the students were sponsored by government departments and efforts were made to provide industrial training for them. Private students on the other hand found it difficult to get industrial training in the private sector. This category of students in general, did not participate actively in industrial training. They were awarded a diploma at the end of the three year academic course and they used this to seek employment in the private sector or to go for further studies abroad.

As the years went by, the student population grew, but participation from the private sector remained minimal. Only those sponsored by firms were given industrial training.

Later more institutions providing technical education were set up. These institutions also required industrial training as part-fulfilment for the award of their diplomas or degrees. The problem was aggravated as these institutions had more non-government-department sponsored students, and the condition for the award applied to everybody.

The University of Technology (formerly the Technical College) has dropped its practical training requirement for its diploma course students. But the University of Malaya and the MARA Institute of Technology still maintain the practical training requirement. The period is however, shorter than that required for the University of Technology diploma.

The University of Malaya and the MARA Institute of Technology manage to provide practical training for all their students. This is achieved with the help of the public sector which absorbs most of the students. Although firms have come forward to offer places for practical training the number is still small. Surveys have shown that only thirty percent of the firms responded favourably to the institutions' request for placements.

Generally, industry is quite reluctant to participate in the industrial training programme because:

- (a) it is unable to provide proper supervision for trainees;
- (b) it is reluctant to accept responsibility and liability for accidents involving trainees;
- (c) it fears the breakdown or damage to expensive machines operated by trainees;
- (d) it is unable to provide allowances to the trainees; and
- (e) it receives no incentives from the government in terms of tax reduction.

Nevertheless, the private sector in Malaysia is beginning to feel the advantage of practical training. They find it to be one way of assessing their would-be employees. They also benefit directly from good trainees who give them productive work and positive suggestions for improvement of the company's work."

## NEW ZEALAND

84. In New Zealand the Vocational Training Council has statutory responsibilities for training and development in all sectors of the economy and at all levels. Twenty-five industry training boards have delegated authority for all training and development in their respective industries. The Vocational Training Council has come to be regarded by authorities as the "voice of industry" in educational matters and represents industry on national educational organizations and the like.

85. Practical work is a requirement of degree courses in engineering in the

University of Canterbury, normally 120 days in approved workshops and approved industries. (25) Among the courses organised in 1975/76 by the Christchurch Technical Institute for 15 participants from Colombo Plan countries was a woodwork teachers' course which included a period of individual experience in local industry.

86. The number of foreign students from developing countries who studied in New Zealand under the official aid programme in 1976 was 794. The number of trainees was 339 (with an average stay of six months). The total number of foreign students in New Zealand in 1973 was 2,624. (22)

87. There are several schemes operating in New Zealand which provide opportunities for industrial training and experience for students or trainees from other Commonwealth countries. They fall into three broad categories:

- (i) those involving sponsorship of the New Zealand Government;
- (ii) those whose programmes have been arranged by the Vocational Training Council; and
- (iii) those arranged privately between the student and the place of employment or institution.

Because training in the last category is arranged on a random basis there is no information available about these trainees or the training they are undertaking in New Zealand. There is a Directory of Advisory Services, prepared by the Productivity Centre of the Department of Trade and Industry. It lists training boards and authorities which are able to provide industrial training and experience. (24)

88. The New Zealand Government sponsors students and trainees from some 35 countries (including Commonwealth countries). Training programmes are arranged on the basis of requests from aid-recipient countries. Industrial training is available in three different areas:

- (i) at universities;
- (ii) technical institutes;
- (iii) private industry.

There are two universities in New Zealand - Canterbury and Auckland - which offer the Bachelor of Engineering degree. Agricultural engineering is a field of study provided by Lincoln College and the Universities of Canterbury and Auckland. This four-year course involves a combination of academic and practical work. A 5-year Bachelor of Architecture degree is available at both Auckland and Victoria Universities.

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(24) Directory of Advisory Services - Productivity Centre - Department of Trade and Industry, Wellington - June 1975

(25) University of Canterbury School of Engineering - 1978 Prospectus.

(22) UNESCO Statistics.

The Food Technology degree course which is offered at Massey University encompasses industrial and applied training and experience.

89. All technical institutes in New Zealand offer a number of industrially-related diploma courses. The prospectus for the Petone Technical Institute gives an indication of the variety of courses offered at NZ technical institutes. The NZ Certificate of Engineering results from a diploma course involving three years of practical work experience as well as academic study.

90. There are at present two technical courses arranged in New Zealand exclusively for foreign students under the Bilateral Aid Programme. A third has a high proportion of foreign students. A woodwork course at the Christchurch Technical Institute is held from February till November each year. At Petone Technical Institute, a metalwork teachers' course runs for the same period. The Timber Industry Training Centre in Rotorua offers a variety of courses in forestry.

91. Industrial training and experience in private industry is arranged under the Bilateral Aid Programme on request from foreign governments. Usually it is possible for the New Zealand Government to provide the requested training. Recent examples of specifically requested training courses are earthquake engineering, pharmaceutical manufacturing, and canning and food processing.

92. Aside from training schemes operated under the Bilateral Aid Programme through the Ministry of Foreign Affairs and those organised privately between employers and prospective trainees, the Vocational Training Council operates as a co-ordinating agency. The Council does not however have statistics available; it merely meets requests as they arise. The Technicians Certification Authority of New Zealand gives detailed information on trade training.

## NIGERIA

93. The Industrial Training Fund, a national agency for the manpower development in Nigeria, was established in 1971. The Fund is financed by contributions from employers of labour throughout the country (one per cent of this total pay-roll) and by subscriptions from the Federal Military Government.

94. A survey undertaken by the Fund showed that the areas of engineering and technology at all levels were severely starved of skilled manpower. These shortages were found to be more acute at the technician, craft, and semi-skilled levels. The findings also showed that in many cases the engineering and technology products of Nigerian universities was looked upon by employers as unsuitable and inexperienced.

95. The Fund therefore established a number of development programmes designed to meet these needs. One such programme is the "Train-the-Trainer" programme started in 1974 under which more than 1,000 training officers, managers, foremen, chargemen and other classes of industrial and commercial personnel drawn from organizations throughout the country have benefited. The Fund organizes a number of courses, including two-day seminars for training officers, 3-week Development of Personnel courses (DOTP), 4-day Salesman Trainers' Courses (ST) and industrial safety courses.

96. A major activity of the Fund is the Students' Industrial Work Experience Scheme (SIWES) started in 1973. The scheme is a co-operative effort to help students of engineering and technology to do three months practical internship in industry. The attachment programmes are now becoming part of the participants' requirements for graduation.

97. ITF has sponsored a group training scheme for the textile industry designed to help the smaller firms to establish group training centres. Similar schemes are being planned for other industries such as: construction, paper and pulp, food and drinks, road transport, electrical and electronics, mechanical and automotive engineering. (26), (27), (28).

Nigeria is a member of IAESTE and of AIESEC.

## SINGAPORE

98. The Dasgupta survey reported that with the coming of more and more precision engineering and machine building industries to Singapore, a pilot scheme for overseas industrial training was evolved. Under this scheme, apprentices were attached to reputable companies in Germany and Switzerland for long-term training to reach the respective national apprenticeship standards.

99. The Science Council Survey lists a number of project-oriented training courses in which participants from other countries could be accommodated, covering: seamanship, engineering, wood, building and construction, printing, hotel and catering, fashion and applied arts.

100. The Government of Singapore offers hundreds of places to foreign students for training under the Colombo Plan and ASEAN awards. The total number of foreign students in Singapore in 1973 was 3,599. (3), (5), (18), (22).

## SRI LANKA

101. The Dasgupta survey states that Sri Lanka has now a fair degree of self-sufficiency in regard to engineering graduates in civil, mechanical and electrical engineering. Technicians, supervisory personnel and skilled workers are also available to meet current requirements. In other fields of engineering, there are shortages of chemical engineers, production engineers and some specialized technical-cum-managerial personnel, but these shortages are likely to be overcome with the return of a significant number of Sri Lankan engineers now studying abroad. It is considered that technical education and training facilities at the technical level are adequate to meet the needs of the nation in most fields.

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(26) Industrial Training Fund in Perspective - The Director, ITF, Alhaji M. Dikko

(27) Industrial Training Fund Progress Report 1976-77 - The Director

(28) Industrial Directory of Training Facilities and Resources for Manpower Development at Formal Training Industries - Industrial Training Fund.

102. Both the technicians' and engineers' courses include a whole year of practical training in industry. There have been difficulties in implementing this scheme. There was no tradition to build on, no legislation to support it and a general absence of extensive or versatile industries to receive the trainees, except in the field of civil engineering. Practical training is nevertheless considered to be an essential ingredient of the courses.

103. Training facilities for trainees from other countries exist in Sri Lanka in the following fields: coconut agronomy, management, public administration, rubber research, rural development, and social welfare work. For instance, there are UNDP/ILO assisted courses in business management organized by the National Institute of Management, which include periods on-the-job.

### TRINIDAD AND TOBAGO

104. In the general sense there are no project-oriented training courses as such in Trinidad and Tobago. The large industrial organizations, in particular the oil companies, conduct internal training courses for employees in specific fields for their own requirements.

105. The University of the West Indies has its engineering department (chemical, civil, electrical, and mechanical) on its St. Augustine campus in Trinidad. The John S. Donaldson Technical Institute and the San Fernando Technical Institute offer full-time technician courses in a variety of subjects related to industrial activity. Three technicians from the Technicians' Training College in St. Lucia completed their training in specific areas of industrial activity in Trinidad because there are no facilities for such training in St. Lucia. Trainees for other countries could be accommodated on the petroleum engineering assistant course organized by the Ministry of Petroleum and Mines. Other project-oriented training might be arranged on a government organization basis.

Source: Commonwealth Science Council Survey.

### UNITED KINGDOM

106. Britain is contributing to the increase of the world's supply of trained workers, not only through technical and financial aid programmes in overseas countries but also by accepting students and trainees for study and experience in Britain, through a number of official and voluntary schemes. (29) Many students are financed privately or by their own governments. Awards are

107. British policy in general is to offer training in Britain only where adequate facilities are not available locally. The Ministry of Overseas Development's Technical Co-operation Training Programme (TCTP) is designed to provide the type of training likely to contribute significantly to the economic and social development of the countries concerned within a reasonable time, and in particular, involves courses planned to qualify the recipients for positions of greater responsibility, to increase their efficiency or to enable them to train provided by the Ministry of Overseas Development, mainly under regional aid programmes (including the Colombo Plan), the British Council, United Nations agencies and some overseas governments.

(29) Manpower and Employment in Britain - Industrial Training - Prepared for British Information Services by the Central Office of Information - R5777/77 - due to be published 1977/78. It contains sections on training in industry, training in further education, the European Community and training of students and trainees from overseas.

others. Wherever appropriate, therefore, training is concentrated at post-graduate or senior professional level. To ascertain and increase the TCTP's contribution to the training of essential manpower in developing countries, Britain is increasingly undertaking systematic discussions with individual countries regarding their training requirements and how Britain can best help to meet them.

### Industrial Trainees from Overseas

108. A comprehensive spread of training resources, represented by both nationalised and private industries, Government and private training organizations, professional bodies, research associations and local authorities, is made available by arrangement to technicians, technologists, instructors, supervisors and managers from overseas seeking to complement their professional, academic or trade qualifications by practical training directed toward particular jobs. These training resources fall into four main categories:

- 108.1 those arranged by companies with overseas subsidiaries or associates, for their overseas staff;
- 108.2. those offered by exporting companies, recognizing the value of providing training in the use and maintenance of the goods and service they produce;
- 108.3. those available under sponsorship by the Ministry of Overseas Development (ODM), the International Labour Organization (ILO), and in particular, the Confederation of British Industry (CBI), whereby selected trainees nominated by their own governments or employers are enabled to receive training in Britain at no cost to themselves;

and

- 108.4. those sponsored and funded by the trainees' home governments or employing organizations.

109. Sponsorship by the ODM is normally confined to trainees nominated by their home governments who require a type and level of training that their own country requires in the cause of development but cannot yet provide. Such trainees are usually key individuals for each of whom a 'tailor-made' programme is constructed by the Technical Education and Training Organization for Overseas Countries (TETOC) - a specialist unit of the ODM - designed to fit them for the task which they will undertake on their return home. Programmes are arranged annually for some 200 individuals of whom about 70% come from Commonwealth developing countries, and these are administered by the British Council. TETOC acts similarly on behalf of trainees in Britain sponsored by the ILO.

### Technical Education and Training Organization for Overseas Countries

110. In its annual report for 1976-77 TETOC states that for the first time since TETOC assumed in 1974 professional responsibility for the programming, placing and monitoring of sponsored overseas nationals for practical training in British industry the numbers fell, though only slightly. One reason was the decline in the number of ILO trainees, reflecting cash problems in the United Nations Development Programme. Possibly another was the diminishing impact of the publicity drive undertaken overseas in 1975/76. Whatever the reasons, they did not lie in British industry. Given that they were not, nor were they, required to subsidise overseas trainees themselves, British firms, organizations,

agencies and industries, public and private alike, continued to display their readiness to receive and provide tailored training for key people from the developing world. At the end of the year ODM had measures in hand to revive the publicity that seems necessary if developing countries are to utilise adequately, in their own interests, the training capacity of British industry - and its willingness to be so utilised; for the commercial advantages are as clear as those that accrue to the trainees.

111. An innovation was the introduction of mini-group practical training programmes in industry for small groups of trainees with similar needs at comparable levels: training staff from thermal power station training institutes, power station operators and maintenance engineers, and coal mining engineers from India. This device not only simplifies administration, but more importantly facilitates the forward planning of training programmes related to capital aid projects.

112. By the end of the year plans were well advanced for the first practical evaluation overseas of the benefits derived by a sample of trainees, their sponsors and their employers from industrial training programmes arranged in Britain during the quinquennium.

### The British Council

113. The British Council, which is funded almost entirely from public funds, is incorporated by Royal Charter under which it has the task of promoting a wider knowledge of the UK and the English language abroad and of developing closer cultural relations between the UK and other countries. The Council plays an important part in the placing in educational institutions and others, in this country, of students and trainees from overseas whether paid for by their own countries, funded under the British technical co-operation programme, or sponsored by United Nations or other multi-national organizations. For this purpose the Council has an extensive network of contacts with academic and other institutions and with many other organizations throughout the UK. The Council is also represented in 78 countries.

### Statistics

114. In 1975-76, over 114,000 students and trainees attended courses in Britain. (31) Of this number 31,831 (12,734 Commonwealth) were studying in universities; 10,706 (6,621 Commonwealth) in polytechnics; 35,523 (14,342 Commonwealth) in other further education establishments. Approximately one quarter of the total were studying engineering or technology; or nearer to one third if students taking GCE courses at further education establishments are excluded. (31)

115. There are no comprehensive statistics on the numbers of trainees from overseas or from Commonwealth countries who receive industrial training in Britain. The best estimate in recent years was made as a result of a survey conducted by a Working Party on Industrial Training in 1963, which estimated that at least 6,000 overseas people, (from all countries including Western Europe) were receiving training at that time.

116. Some recent figures are available covering England, Scotland and Wales from the Department of Employment. The DE Gazette for May 1977 states that in 1976 there were 1,181 issues of permits to Commonwealth trainees. This figure cannot be fully analysed but the breakdown by subject shows that more than half of the issues were for commercial/professional training e.g. accountancy, and that the biggest single country in this category was Malaysia. (209)

Issues to trainees in the manufacturing and construction industries and in public utilities were headed by India (39) followed by Australia (24), Malaysia (20), Nigeria (17) and Canada (10).

117. This section of DE statistics does not encompass all categories of on-the-job training. It does not include those who enrol on sandwich courses at universities and polytechnics. For this category DE issues a letter giving permission for the student to undertake employment as an integral part of the course. In 1974 there were 901 letters issued to Commonwealth students out of a total of 1,928 to all overseas students. By far the biggest subject was engineering (595) followed by business studies (101), computer technology (49), accountancy (45), food technology (30), building (16), architecture (15). No analysis by country is available. In 1975, 1,571 Commonwealth sandwich students were given approval to take employment in accordance with the requirements of the course. Detailed breakdown by countries or by subject is not available but the Department of Employment estimates that the increase is largely accounted for by Malaysian and Sri Lankan students. Since most sandwich courses are for four years and assuming an average of one year's practical training within that period, it can be estimated that in any one recent year the number of Commonwealth students undergoing practical training is at least 1,000.

118. DE also publishes in its Gazette statistics on issues of work permits and permissions (permissions may be issued to people already in Britain (such as visitors), In 1976 work permits and permissions were issued to 224 Commonwealth citizens for employment in manufacturing and construction industries and public utilities industries. Greatest numbers by country were : Australia (86), Canada (51), India (51), Hong Kong (24), Malaysia (24), West Africa (countries not specified) (14). DE statistics (apart from sandwich course students) do not indicate the level of training/employment nor the period. Permits and permissions are for a maximum of 12 months. In cases where there is no payment of wages, there is no need for a permit and there are therefore no statistics available of the numbers of such cases. (Except for the ODM bilateral programmes)

119. In 1976, 7,337 students and trainees came to Britain on courses of study or training under British Government financial programmes (32). Of this number, 2,745 (1,463 from developing countries of the Commonwealth) were trainees in the following fields of training:

Renewable natural resources	163
Economic infrastructure	245
Industry and Commerce	364
Public administration	1,265
Education	413
Health and Social Welfare	292
Mining	3

(31) Statistics of Overseas Students in Britain 1975-76 - The British Council 1977

(32) British Aid Statistics 1971-75 - Ministry of Overseas Development, 1977 (information for 1976 provided by ODM in advance of publication of 1978 edition)

## Sandwich Courses in Polytechnics and Universities

120. There has been a rapid growth in Sandwich Course degrees in the United Kingdom from 1966 to 1972 due to the establishment of nine technological universities and 30 polytechnics. In 1974 a Joint Working Party was set up between the universities, the polytechnics and industry to study the situation and its associated problems. They quoted a total of 33,720 i.e. 35% of the total of 96,290 students. It was anticipated that this figure would rise to approximately 17,300 by 1981.

121. Sandwich course students may be either industry-based or university-based. For industry-based students the problem of obtaining an industrial placement presents no problems since it is provided by the sponsoring firm. However the percentage of university-based students is tending to increase (e.g. in Brunel it has increased from 56% of the total in 1971 to over 80% in 1977). For this category the onus on finding industrial placements rests on the university or polytechnic. This presents special problems in the case of overseas students.

122. One of the principal advantages to industry in providing training for sandwich students is the opportunity to observe the potential recruit under work conditions. In the case of overseas students there is normally no such advantage to industry since the student will in due course return home and obtain employment in his own country. A further disadvantage is that, whereas for British students in most cases the receiving firms/organization can claim a grant from the appropriate Training Board, for overseas students normally they cannot. Section 14 of the Industrial Training Act, 1964, which is now incorporated in the Employment and Training Act 1973 provides for the training of people from overseas under Training Board arrangements, provided the cost is met from other sources. There seems little doubt that sandwich courses are particularly appropriate to students from the developing countries. By combining work experience with the planned university degree programme, theory and practice are closely integrated. Study within the college and training outside are closely supervised. Welfare arrangements, and in particular the arrangement of suitable living accommodation are re-inforced by the services which colleges are required to provide for all their students.

123. The special problems and considerations of arranging sandwich training for overseas students have received particular attention recently by several organizations and their activities are continuing:

The organizations concerned are:

The Universities Committee on Integrated Sandwich Courses (UCISC)

The Polytechnics Committee on Sandwich Courses (PCS)

The Overseas Students Advisory Bureau (OSAB)

The Standing Committee on Overseas Placement and Experience (SCOPE)

The UK Branch of the International Association for the Exchange of Students of Technical Experience (IAESTE)

The United Kingdom Council for Overseas Student Affairs (UKCOSA)

124. The Polytechnics Committee on Sandwich courses has set up a sub-committee on the placement of overseas students. The sub-committee take the view that overseas students who present the greatest problems are private students

who require work experience/training in order to earn money to continue their studies. The least difficulty occurs with those who require no pay e.g. those who are sponsored by a company, an overseas government, or come under bi-lateral or multi-lateral programmes and are normally administered by the British Council and TETOC. Because of the lack of precise information about the scale and nature of industrial training in the UK, SCOPE is planning to conduct a survey which will involve the issue of a questionnaire to firms and organisations. This questionnaire was in advanced draft form in November 1977. It seeks to obtain information on the extent and nature of placements provided, from where they come and by what means or sponsorship. The scale of distributions of the questionnaire had yet to be decided. To help meet the more immediate needs Mr. David Grantley, Director of the Overseas Students Advisory Bureau, with the support and co-operation of UCISC and PSC and under the aegis of UKCOSA is drafting a letter addressed to multi-national companies. The letter will draw attention to the needs of overseas students from the developing countries and to the benefits which may accrue to companies both in trade terms and in recruiting indigenous personnel for subsidiary or associated companies overseas.

125. There is evidence that the recession of recent years has forced companies to look at training programmes from an increasingly cost-conscious viewpoint and this has operated potently against students from the lesser developed countries where the benefit to the company even in the long-term may be difficult to discern. There are however indications that recently there has been some improvement in the willingness of companies to take overseas trainees, though the assessment of advantage to the company remains crucial. In the longer term it is the policy of UCIS and PCS to promote a greater degree of co-ordination in industrial placements by universities and polytechnics. At present contacts with firms and organisations are frequently regarded as confidential by individual members of the staff and there is a reluctance to share them. The UCIS and PCS view is that a more open approach would make it easier to identify particular deficiencies and would facilitate action on remedying them.

Sources: The section on Sandwich courses is derived from information obtained from officers of the organizations mentioned. It consists of a number of unpublished papers (e.g. a paper on Sandwich courses by Alan Daniels, Director of the Institute of Industrial Training, Brunel University and the Chairman of The Universities Committee on Integrated Sandwich Courses) and information obtained from discussions.

### CBI Overseas Scholarships

126. The Confederation of British Industries' Scholarship scheme was started in 1950 with the support of the British Government and with the object of bringing to Britain for training in British industry graduate engineers from countries overseas. It was visualised that this would be to the advantage of the scholars and to the countries from which they came, and it was hoped also that trade between their countries and Britain would increase as a result of the ties formed between the scholars and the firms giving them training.

127. In all, 1,733 scholars have come to Britain including 575 from Commonwealth countries, e.g. Australia (182), India (82), New Zealand (72), Hong Kong (47), Nigeria (35), Malaysia (35), Bangladesh (29), Sri Lanka (19), Jamaica (16), Rhodesia (14), Kenya (9), Ghana (7), Trinidad and Tobago (7). In 1977, 35 awards were made to trainees from the following Commonwealth countries: Australia (13), Canada (1), Hong Kong (4), India (2), Kenya (1), Malaysia (10), New Zealand (13), Singapore (2).

Source: CBI Overseas Scholarships - 22nd Annual Report, 1976, CBI December 1976.

128. Under the CBI scheme, no reimbursement is made to the firms accepting scholars; most firms, therefore, tend to look at any potential commercial benefit which might result from accepting scholars for training. The number of applications for scholarships has increased which indicates that there is no shortage of enthusiasm from overseas engineers for training in the UK.

Standing Conference on Overseas Placements and Exchanges (SCOPE)

(Secretariat - Central Bureau for Educational Visits and Exchanges)

129. Membership of SCOPE is open to organizations concerned in the placement abroad for industrial experience of British students and the placement and reception in Britain of overseas students. Its purposes are to provide a forum for discussion; to assemble relevant data and provide advisory services; and to make collective representations at influential members on matters of common concern. Its constitution was adopted and officers were elected at a plenary meeting in November 1977. The Chairman is Mr. D. Mumford, formerly Principal, Cambridgeshire College of Arts and Technology. A seminar on the sandwich mode of higher education and the potential for exchanges of work placements was organized under the auspices of SCOPE in January 1977.

## Conclusions

130. The foregoing sections of this survey show that a great deal is going on in the provision of practical training and experience in industry for engineers, technologists and technicians. However, these brief and in some cases impressionistic statements of the position do not add up to a quantitative or qualitative assessment of all that is going on. The writer's experience in assembling information suggests that a basis for such an assessment is virtually unattainable. As the New Zealand and UK sections show, an unknown amount of training and experience is provided outside the framework of specific schemes and within the framework of the regular national education and industrial arrangements of host countries. Moreover, if and when all the training carried out could be identified, it would have to be evaluated in relation to a number of different objectives. Not all providers of training have the same objectives; for example, some schemes like that of UNIDO are specifically oriented towards industrialisation, other like of the ILO towards national manpower requirements, and others like that of UNESCO more towards the professional development of the individual; others again, like the British official aid scheme, have mixed objectives.

131. From the various authoritative sources, there seems to emerge a consensus that not enough is going on. Successive Commonwealth Education Conferences have identified serious short-falls in the available opportunities for practical training and experience, and called for remedial measures. Most of the countries responding to the Commonwealth Science Council's questionnaire appear to subscribe to the view that not enough is being done. A number of problems and constraints are identified, especially in the Colombo Plan and New Zealand contributions. The problems of providing for trainees are clearly greater than the problems of providing for students.

132. One feature of the picture is that the private sector appears somewhat neglected under official schemes, perhaps partly because much of it is concerned with manufacturing which is not wide-spread in many developing countries and partly because, under formal schemes of assistance, nominations have to be made by governments and the majority of those nominated tend to be employees of governments; though most schemes provide that, if governments wish to nominate trainees from the private sector, they are perfectly free to do so. It is not clear from the information why, given the urgent needs voiced by the authorities referred to, there are not more nominations than there are for placements and training under existing schemes. For example, the number of requests to the CFTC is very small indeed in the area of practical training in engineering or technology-based industries.

133. Because of the ambivalent nature of the evidence - a big alleged demand on the one hand and few specific requests on the other - it is difficult to identify directions in which programmes need to be developed. One obvious line of development is sandwich courses. These are dealt with mainly in the UK section, but in the form of "co-operative courses" they are equally common in Canada. They have been launched successfully in India and other Commonwealth Asian countries, and a comparable alternation of academic study and practical experience achieved by the Work Experience Scheme operated by the Industrial Training Fund of Nigeria. Placement in sandwich or co-operative courses at least ensures that some training or experience in industry is packaged with courses of education; though training in these circumstances is mainly basic and general rather than specific and job-related.

134. Little evidence emerges about movement between developing countries, the advantages of which have been pointed out by the Commonwealth Experts Group (of Economists) and the Team of Industrial Specialists. The constraints operative in the case of movements from developing to developed countries may be even stronger in the case of movements from developing to developing countries;

for example accommodation and welfare and the provision of the right training, properly supervised by qualified staff, may present even greater organizational and financial problems. It may be that this is an area in which guidelines might be laid down for co-operative arrangements between developing countries. It may also be that some kind of a centralised clearing-house is needed as an aid to matching the required training or experience with the industrial enterprises and organizations that are able to provide it; the systematic and continuous development of data of the kind brought together for the first time by the survey and by the CSC questionnaire could be a useful beginning. Finally, it may be worth considering whether appropriate educational institutions in host countries could assume, on a co-operative basis, the roles of supervising, accommodating, and even placing selected trainees from other Commonwealth countries in firms or industrial organizations in their immediate neighbourhood. These roles feature to some extent in the IAESTE and IAESSEC schemes. Progress could perhaps be assisted through the good offices of these Associations, of the Association of Commonwealth Universities, and of any regional association of polytechnics.

# Responses to Commonwealth Science Council Questionnaire

TABLE 2

## National Coordination of Non-formal Industrial Training Programmes in Developing Commonwealth Countries

Country	National Coordination of Industrial Training
Cyprus	<p>1. Board of Governors of the Higher Technical Institute, Higher Technical Institute, PO Box 2423, Nicosia.</p> <p>In this Board there are representatives of:</p> <ul style="list-style-type: none"> <li>- Government</li> <li>- Employers Association</li> <li>- Workers Association</li> <li>- Professional Associations</li> </ul> <p>2. Ministry of Labour, Nicosia.</p> <p>The Ministry organizes the Apprenticeship Scheme Training Courses and various Technical Colleges undertake the teaching.</p> <p>3. Productivity Centre, Nicosia.</p> <p>Follows closely the industrial and other developments in the country and in identifying a gap provides the necessary short training courses.</p> <p>All the above mentioned bodies can organize and finance fully or partly short training courses.</p>
Ghana	<p>There is no national coordination of non-formal industrial training programmes.</p>
Guyana	<p>There is no national coordination of non-formal industrial training programmes.</p>
Kenya	<p>1. National Industrial Vocational Training Council, PO Box 74494, Nairobi.</p> <p>The NIVTC is under the Directorate of Industrial Training of the Ministry of Labour and is governed by the Industrial Training Act (Cap.237).</p> <p>2. Management Training and Advisory Centre, PO Box 42079, Nairobi.</p> <p>Coordination is still at a very elementary stage.</p>
Mauritius	<p>At present there is no national body responsible for the coordination of non-formal industrial training programmes in the country. It is however expected that the National Training Office proposed to be set up during the 1975-80 Plan period to coordinate all vocational training in the country will assume responsibility for non-formal industrial programmes also.</p>

TABLE 2 (contd)

## National Coordination of Non-formal Industrial Training Programmes in Developing Commonwealth Countries

Country	National Coordination of Industrial Training
Nigeria	<p>In order to encourage local industries to offer industrial training generally, so as to build up rapid local technical expertise and promote transfer of technology into Nigerian industries, the Government established an Industrial Training Fund (ITF) which requires all manufacturing industries to make a contribution into the fund for use in paying for training in any industry with appropriate training facilities. Although the impact of the ITF is yet to be assessed, the present indications are that whereas private industries are willing to contribute to the fund, they are not so willing to get involved in training, even when the training is to be paid for from the ITF, except for their employees.</p> <p>The lack of facilities for general acquisition of industrial skills, and the reluctance of existing industries to offer general practical training has led to a proposal presently being canvassed in Nigeria for the establishment of industrial centres linked to universities, to undertake a number of manufacturing activities on a limited scale, as a basis for providing practical training for qualified scientists, engineers and technicians.</p>
Singapore	<p>Industrial training at the vocational level is coordinated by the Industrial Training Board (Kay Siang Road, Singapore 10). Productivity, industrial management and related courses are coordinated by the National Productivity Board (Off Corporation Road, Singapore 22). The Science Council of Singapore coordinates an orientation programme on a national basis for technical college and university students during their main vacations.</p>
Trinidad and Tobago	<p>There are no institutional facilities for the coordination of non-formal industrial training programmes. In Trinidad, however, there are two institutions, financed by Government, which offer full-time courses of training at day and evening classes, in a variety of subjects related to industrial activity. They are the John S Donaldson Technical Institute in Port-of-Spain and the San Fernando Technical Institute in San Fernando.</p>
Uganda	<p>National Industrial Training Council c/o Directorate of Industrial Training P O Box 20050, Lugogo Kampala, Uganda.</p>

TABLE 3

Present Deficiencies in Existing National Industrial  
Training Situation in Developing Commonwealth Countries

(New Zealand has been included in this Table for the purpose of comparison only)

Country	Present Deficiencies in Existing National Industrial Training Situation
Cyprus	<p>Individual industries do not normally provide in-house training.</p> <p>There is no provision to release people employed in the industry for attending courses.</p> <p>No training is arranged by professional bodies.</p> <p>International coordination and cooperation is inadequate and should be strengthened.</p>
Ghana	<p>There are not sufficient numbers of existing industrially-oriented training institutions for technicians.</p> <p>There is no provision to release people employed in the industry for attending courses.</p> <p>Although the training requirements of the public sector industries is looked after by training inside and outside the country, there is little or no provision for training personnel of the private sector industries.</p> <p>No training is arranged by professional bodies.</p> <p>There is no national coordination of post-academic training efforts.</p> <p>International coordination and cooperation is inadequate and should be strengthened.</p> <p>The absence of a national body responsible for industrial training at various levels is a very serious gap.</p>
Guyana	<p>There are not sufficient numbers of existing industrially-oriented training institutions for technicians.</p> <p>Individual industries do not normally provide in-house training.</p> <p>There is no provision to release people employed in the industry for attending courses.</p> <p>Although the training requirements of the public sector industries is looked after by training inside and outside the country, there is little or no provision for training personnel of the private sector industries.</p> <p>Training arranged by professional bodies are inadequate and non-existent.</p> <p>There is no national coordination of post-academic training efforts.</p> <p>International coordination and cooperation is inadequate and should be strengthened.</p> <p>There is need for more coordination as regards technical education at the national level. Training programmes for professionals, technicians and craftsmen need to be established.</p>

TABLE 3 (contd)

Present Deficiencies in Existing National Industrial  
Training Situation in Developing Commonwealth Countries

(New Zealand has been included in this Table for the purpose of comparison only)

Country	Present Deficiencies in Existing National Industrial Training Situation
Kenya	<p>There are not sufficient numbers of existing industrially-oriented training institutions for technicians.</p> <p>Individual industries do not normally provide in-house training.</p> <p>There is no national coordination of post-academic training efforts.</p> <p>International coordination and cooperation is inadequate and should be strengthened.</p> <p>There is a lack of competent trainers in industrial management.</p>
Mauritius	<p>Although the training requirements of the public sector industries is looked after by training inside and outside the country, there is little provision for training personnel of the private sector industries.</p> <p>Training arranged by professional bodies is inadequate.</p> <p>There is no national coordination of post-academic training efforts. But in future, coordination of all vocational training will be carried out by the Central Training Office which will be set up during the 1975-80 Plan period.</p> <p>International coordination and cooperation is inadequate and should be strengthened.</p>
New Zealand	<p>Industries and firms do not normally provide in-house training.</p> <p>Training arranged by professional bodies are inadequate.</p> <p>Regarding national coordination, the Engineering Industry Training Board coordinates training in this sector, but there is little coordination in other sectors.</p>
Singapore	<p>Individual industries do not normally provide in-house training.</p> <p>There is no provision to release people employed in the industry for attending courses.</p> <p>Although the training requirement of the public sector industries is looked after by training inside and outside the country, there is little or no provision for training personnel of the private sector industries.</p> <p>Training arranged by professional bodies are inadequate.</p> <p>There is no national coordination of post-academic training efforts.</p>

TABLE 3 (contd)

Present Deficiencies in Existing National Industrial Training Situation in Developing Commonwealth Countries  
(New Zealand has been included in this Table for the purpose of comparison only)

Country	Present Deficiencies in Existing National Industrial Training Situation
Trinidad and Tobago	<p>Apart from the courses by the Ministry of Petroleum and Mines only two institutions*in the country provide industry-oriented training for technicians.</p> <p>The large industrial concerns, mainly the oil companies, do provide in-house training courses for their employees to meet their own specific manpower requirements. With the exception of these, there is little or no activity in this field.</p> <p>It has happened on rare occasions that persons employed in industry have been released by their respective organizations to attend courses of training at the JSD or the San Fernando Technical Institute in some desirable skill. This practice might be described as ad hoc and is pursued exclusively with the interest of the organization in mind. In special cases some local organizations secure attachments to their principals or other organizations abroad, again for their own benefit.</p> <p>There is a partial lack of organized training facilities in both the public and private sectors, and wheresome training does exist it is felt that the system can be improved.</p> <p>The professional associations are not at present geared to provide any form of training on their own, but interest is high and there is no doubt that their voices will be heard in time.</p> <p>There is no coordination of post-academic training activity at the national or international level. Facilities for training abroad do come our way occasionally through fellowships offered by such organizations as UNESCO, CIDA, and OAS, to mention a few.</p>
Uganda	<p>Individual Industries do not normally provide in-house training. There is no provision to release people employed in the industry. Training arranged by professional bodies are inadequate. International coordination and cooperation is inadequate and should be strengthened.</p> <p>The number of existing training institutions is adequate but certain areas need expansion and additional technologies. There is provision for training but industrial participation is inadequate.</p> <p>* John S Donaldson Technical Institute and San Fernando Technical Institute.</p>

TABLE 4

Existing Project-Oriented Training Courses in Developing Commonwealth Countries in which Participants from Other Countries in the Region Could be Accommodated

Country	Details of Courses			
	Title of Course	Level	Duration	Institution running the course
Cyprus	Longer courses in Engineering of an "endorsement" to the Diploma nature		3 years	Higher Technical Institute
	Regular full-time courses for Technical Engineers in the fields of: - Civil Engineering ) - Electrical Engineering ) - Mechanical Engineering ) - Electrical Technician ) - Electronic Technician ) - Mechanical (Fitter and turner) ) - Automechanics technician) - Cabinet making ) - Sheet metal and welding ) Most of the above courses are of long duration (up to 3 years) but shorter intensified courses could be organized.			Higher Technical Institute  Technical School Nicosia
Ghana	Scientific glass blowing ) Repair and construction ) of laboratory glassware )			Glass Instruments Unit
	Instrumentation			Proposed Ghana/UNDP Scientific and Instrumentation Centre, CSIR
Guyana	Owner Drivers course			Government Technical Institute
	Household Electricity Course			Government Technical Institute
	Joinery			Guyana Forest Industries Corporation
	Logging and saw-milling			Guyana Forest Industries Corporation
	The Guyana Association of Professional Engineers, the Guyana Industrial Training Centre; the Ministry of Labour and Social Security;			

TABLE 4 (contd)

Existing Project-Oriented Training Courses in Developing  
Commonwealth Countries in which Participants from Other  
Countries in the Region Could be Accommodated

Country	Details of Courses			
	Title of Course	Level	Duration	Institution running the course
Guyana (contd)	the Guyana Sugar Corporation (formerly Bookers Sugar Estates) do not offer non-formal training, but have indicated their willingness to make their existing training resources available			
Kenya	Familiarization and exposure to the work that has been done in the establishment and organization of small scale industries in Kenya			Kenya Industrial Estates Ltd.
	Post-graduate course in Public Health Engineering			University of Nairobi
	Technical Courses in Mechanical Engineering, Electrical Engineering Building; Laboratory Technology and courses in Public Accounts and Public Secretaryship Industrial Management			Kenya Polytechnic and Mombasa Polytechnic  The Management Training and Advisory Centre
Nigeria	No details as to the available courses have been provided but it has been indicated that the limited facilities in Nigeria for training of technicians particularly in the public sector can be shared with other developing countries particularly in the Africa region, on a bilateral basis.			
Singapore	Day courses for:			Singapore Polytechnic
	Master (foreign-going) Certificate		16 weeks	
	First Mate (foreign-going) Certificate		16 weeks	
	Second Mate (foreign-going) Certificate		16 weeks	

TABLE 4 (contd)

Existing Project-Oriented Training Courses in Developing  
Commonwealth Countries in which Participants from Other  
Countries in the Region Could be Accommodated

Country	Details of Courses			
	Title of Course	Level	Duration	Institution running the course
Singapore (contd)	Day courses in English or National Language for:			Singapore Polytechnic
	Master (Home-Trade) Certificate		12 weeks	
	Mate (Home-Trade) Certificate		12 weeks	
	Evenings only courses in English or National Language for:			
	Master (Local Trade) Certificate		12 weeks	
	Mate (Local Trade) Certificate		12 weeks	
	Helmsman (Local Trade) Certificate		12 weeks	
	Short special courses for:			
	Radar Observer's Certificate		3 weeks	
	Radio Telephony		4 weeks	
	Marine Radio Officers Conversion Course		6-8 months	
	Marine Radio Officers Revalidation Certificate		variable	
	Radar Simulator Courses Pt 1 Radar Plotting and Interpretation Pt 2		5 days	
	Simulator Training		5 days	
	Correspondence course leading to the Second Mate course		3 years	
	First Aid at Sea Certificate course		6 lectures and practicals	
Shipmasters' Medical Training Certificate course		9 lectures and practicals		
Short courses for Engineer Officers in Merchant Navy				
Part A or Part B of either 2nd Class or 1st Class Certificate of Competency		3 months		
<u>Mechanical Engineering</u>			Industrial Training Board	
Mechanical Engineering	Industrial Technician	2 years		
Mechanical Engineering Drawing and Design	Industrial Technician	2 years		

TABLE 4 (contd)

Existing Project-Oriented Training Courses in Developing  
Commonwealth Countries in which Participants from Other  
Countries in the Region Could be Accommodated

Country	Details of Courses			
	Title of Course	Level	Duration	Institution running the course
Singapore (contd)	Automotive Engineering	Industrial Technicians	2 years	Industrial Training Board
	Industrial Plant Engineering	Industrial Technician	2 years	
	Metal Machining	Tradesman Grade 3	1 year	
	Motor Vehicle Mechanic	Tradesman Grade 3	1 year	
	Motor Vehicle Mechanic	Tradesman Grade 2	1 year	
	Heavy Duty Diesel Mechanic	Tradesman Grade 3	1 year	
	Heavy Duty Diesel Mechanic	Tradesman Grade 2	1 year	
	Maintenance Fitting Mechanic	Tradesman Grade 3	1 year	
	Marine Fitting Mechanic	Tradesman Grade 3	1 year	
	<u>Electrical/Electronic Engineering</u>			
	Electrical Engineering	Industrial Technician	2 years	
	Electronic Engineering	Industrial Technician	2 years	
	Air-conditioning and Refrigeration Engineering	Industrial Technician	2 years	
	Electrical Fitting and Installation Mechanic	Tradesman Grade 3	1 year	
	Electronic Servicing Mechanic	Tradesman Grade 3	1 year	
	Refrigeration Mechanic	Tradesman Grade 3	1 year	
	<u>Metal Fabrication Trades</u>			
	General Welding	Tradesman Grade 3	1 year	
	Metal Fabrication	Tradesman Grade 3	1 year	
	<u>Wood, Building and Construction</u>			
	Furniture Design and Production	Industrial Technician	2 years	

TABLE 4 (contd)

Existing Project-Oriented Training Courses in Developing  
Commonwealth Countries in which Participants from Other  
Countries in the Region Could be Accommodated

Country	Details of Courses				
	Title of Course	Level	Duration	Institution running the course	
Singapore (contd)	Building Drafting	Tradesman Grade 3	1 year	Industrial Training Board	
	Furniture and Vehicle Upholstery	Tradesman Grade 3	1 year		
	Furniture Making	Tradesman Grade 3	1 year		
	Machine Woodworking	Tradesman Grade 3	1 year		
	Plumbing and Pipe Fitting	Tradesman Grade 3	1 year		
	<u>Printing Trades</u>				
	Letterpress Printing Processes	Industrial Technician	2 years		
	Offset Printing Processes	Industrial Technician	2 years		
	Composer's Work	Tradesman Grade 3	1 year		
	Letterpress Printing	Tradesman Grade 3	1 year		
	Offset Lithographic Printing	Tradesman Grade 3	1 year		
	<u>Hotel and Catering</u>				
	Accommodation Operations	Tradesman Grade 3	1 year		
	Food and Beverage Operations	Tradesman	1 year		
	<u>Fashion and Applied Arts</u>				
	Fashion Arts	Industrial Technician	2 years		
	Advertising Arts	Industrial Technician	2 years		
	3-Dimensional Art	Industrial Technician	2 years		
	Interior Design	Industrial Technician	2 years		
	Dressmaking	Tradesman Grade 3	1 year		
	Men's Tailoring	Tradesman Grade 3	1 year		

TABLE 4 (contd)

Existing Project-Oriented Training Courses in Developing  
Commonwealth Countries in which Participants from Other  
Countries in the Region Could be Accommodated

Country	Details of Courses			
	Title of Course	Level	Duration	Institution running the course
Singapore (contd)	<p>Various port-related topics, eg</p> <p>(a) Civil Works - including wharf maintenance and major projects</p> <p>(b) Cargo handling equipment-repair and maintenance</p> <p>Possibly in future</p> <p>Topics ranging from oil processing to environmental conservation</p>		<p>Variable duration lasting up to six months</p> <p>at least 2 months</p>	<p>Port of Singapore Authority</p> <p>Singapore Airlines</p> <p>Shell Companies</p>
Trinidad and Tobago	<p>No formal procedure exists to accommodate participants from outside the country but it is not unreasonable to assume that special arrangements can be made to grant assistance in any field of activity in which the competence exists and adequate arrangements can be made on a Government/Government Organization basis</p> <p>Petroleum Engineering Assistant Course</p>		<p>25 lectures</p>	<p>Ministry of Petroleum and Mines</p>
Uganda	<p>Motor Vehicle Mechanics</p> <p>Office &amp; Domestic Appliances</p> <p>Armature Winding</p> <p>Welding and Fabrication</p> <p>Machining Fitting</p> <p>Carpentry &amp; Joinery</p> <p>Electrical Installation</p> <p>Plumbing</p> <p>Mining Technology</p>			<p>Directorate of Industrial Training and the Vocational Training Centre, Ministry of Labour.</p> <p>Kilembe Mines Limited.</p>

TABLE 5

Suggested Topics by Developing Commonwealth Countries for Organizing Courses, on a Regional Basis, to Meet Regional Needs, by External Multilateral Agencies

Country	Topic	Duration	National Agency To Take Part	Mode of National Input
Cyprus	Maintenance of Medical Laboratory Equipment	9 months	Higher Technical Institute	Participation of Higher Technical Institute, Technical College and Productivity Centre in resource personnel
	Maintenance of Agricultural Processes	8-9 months	Higher Technical Institute and Technical College	
	Laboratory Equipment			
Ghana	Basic Industrial Engineering Production Control and Management	6-12 months	Food Research Institute	Help formulate the course programme; provide resource people and a venue
	Preventive Maintenance in Plant Engineering	3-6 months	Accra Polytechnic	Help formulate the course programme
	Instrumentation and Electronics	6-12 months	Ghana/UNDP Scientific and Instrumentation Centre	Provide venue; help formulate the course programme; provide resource people; and run the course
	Geophysics	6-12 months	UST, Kumasi	Help formulate the course programme
	Scientific Glass Instruments Making	1-2 years	Glass Instruments Unit, CSIR	Provide venue; help formulate course programme; and run the course
Guyana	Heavy Duty Vehicles Maintenance	6 months	Guyana Gajraj Ltd	Provide resource people
	Industrial Management	3-6 months	Guyana Rice Board	
	Work-study Techniques	3-6 months	Guyana Rice Board	
	Mobilization and Organization of persons with indigenous skills	1 year	Ministry of Regional Development	
	Printing		Guyana Printers Ltd.	
	Good Manufacturing Practice	2 weeks	Guyana Pharmaceutical Corporation	Provide resource people; help formulate the course programme

TABLE 5 (contd)

Suggested Topics by Developing Commonwealth Countries for Organizing Courses, on a Regional Basis, to Meet Regional Needs, by External Multilateral Agencies

Country	Topic	Duration	National Agency To Take Part	Mode of National Input
Guyana (contd)	Food Technology/Science		Guyana Agricultural Products Corporation	Provide resource people
	Training of Technical Teachers	10-12 weeks	Guyana Association of Professional Engineers	Provide venue and resource people; help formulate the course programme
	Land Surveying	3 years	Government Technical Institute	Help formulate the course programme; and run the course
	Industrial Management	6-12 months	Ministry of Labour and Social Security	Help formulate the course programme
Kenya	Agriculture	7 terms	Mombasa Polytechnic	Run the course
	Marine Engineering	7 terms	Mombasa Polytechnic	Provide venue; resource people and take part in formulating programme
	Industrial Training for Mechanical and Electrical Engineers	1-2 years	University of Nairobi	Provide venue and take part in formulating programme
	Tour of factories sponsored by the Kenya Industrial Estates as an example of industrial development		Kenya Industrial Estates	Provide participants
	Secondment of key technical personnel to Kenya Industrial Estates and related industries		Kenya Industrial Estates	Provide participants and physical facility
Mauritius	Textile machinery maintenance, including sewing machine	3 months		
	Precision Engineering	6 months		
	Sheet metal work	3 months		

TABLE 5 (contd)

Suggested Topics by Developing Commonwealth Countries for Organizing Courses, on a Regional Basis, to Meet Regional Needs by External Multilateral Agencies

Country	Topic	Duration	National Agency To Take Part	Mode of National Input
Singapore	<u>Topics for Workshops</u>			
	Training systems and certifications for craftsmen and tradesmen in this region	1 week	Industrial Training Board	Provide venue and help formulate the course programme
	Craft teachers/ Instructors recruitment and training system	1 week		
	Trade science and Mathematics in craft and trade courses			
	<u>Topics for Courses</u>			
	Manpower planning in relation to industrialization	2-3 months		
	Industrial training project analysis and evaluation	2-3 months		
	Personnel management and development in relation to staffing in industrial training organization	2-3 months		
	Port-related matters - e.g. containerization, wharf development, wharf equipment etc.		Port of Singapore Authority	Provide resource people (depends on nature of programme)
Air transport	2-3 weeks	Singapore Airlines	Help formulate the course programme	
No specific topic suggested		Ngee Ann Technical College	Provide venue; resource people; help formulate the course programme and run the course	

TABLE 5 (contd)

Suggested Topics by Developing Commonwealth Countries for Organizing Courses, on a Regional Basis, to Meet Regional Needs by External Multilateral Agencies

Country	Topic	Duration	National Agency To Take Part	Mode of National Input
Singapore (contd)	Depending on training needs		Shell Companies	Provide venue and resource people and help formulate the course programme
Trinidad and Tobago	In the course of an elementary survey completed sometime ago certain organizations in both the public and the private sectors signified the need for training for the benefit of their personnel. They were not specific. A deeper national survey would be necessary for provision of a complete answer to this question			
	Petroleum Industry Management	6 months - 1 year	Ministry of Petroleum and Mines	Help formulate the course programme
	Petroleum Industry Supervision (Technical)			
Uganda	Tool and Die Maker Instrument Fitters Registration and Air Conditioning. Typewriter Mechanics. Industrial Electronics.	12 months	Directorate of Industrial Training	Provide venue and resource people and help formulate the course programme
	Mining Technology	6 months	Kilembe Mines Ltd	- do -
	Road Construction and Maintenance	6-12 months	National Housing Corporation	- do -
	Heavy Equipt. and Plant Maintenance			- do -
	Lift Maintenance			- do -
	Sugar Technology	12 months	Karira Sugar Wks	- do -
	Textile Technology	12 months	Nat. Textile Board	- do -

## APPENDIX II

Numbers of students and trainees from developing countries financed under official programmes of members of the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OEC)

	Students		Trainees		TOTAL	
	Nos	Man-months	Nos	Man-months	Nos	Man-months
<b>EEC Members</b>						
Belgium	6910	57606	1596	3375	8506	60981
Denmark	226	1447	97	441	323	1888
France (1)	9443	113316	5114	39808	14557	153124
Germany	4789	37488	23080	115147	27869	152635
Italy	895	5162	1313	8424	2208	13586
Netherlands	1574	7799	387	1164	1961	8963
UK	12194	88854	3876	16116	160701	104970
<b>TOTAL EEC</b>	<b>36031</b>	<b>311672</b>	<b>35463</b>	<b>184475</b>	<b>714941</b>	<b>496147</b>
<b>Other DAC Members</b>						
Australia	2552	24584	1443	6758	3995	31342
Austria	3685	33111	181	1172	3866	34283
Canada	1540	13856	146	835	1686	14691
Finland	62	573	129	191	191	764
Japan	856	10026	5497	20476	6353	30502
New Zealand	890	8758	336	1973	1226	10731
Norway	391	2039	118	360	509	2399
Sweden	34	345	8	39	42	384
Switzerland	403	2976	452	2435	855	5411
USA (1)	9596	86364	5032	15096	14628	101460
	<b>20009</b>	<b>182632</b>	<b>13342</b>	<b>49335</b>	<b>33351</b>	<b>231967</b>
<b>ALL DAC MEMBERS</b>	<b>56040</b>	<b>494304</b>	<b>48805</b>	<b>233810</b>	<b>104845</b>	<b>728114</b>

(32) British Aid Statistics 1971 to 1975  
 Ministry of Overseas Development 1977  
 (Figures for 1976 made available in advance of 1978 edition)

APPENDIX III

Numbers of Foreign and Commonwealth students enrolled  
in institutions of higher education  
in Commonwealth countries in 1973

<u>Country of Study</u> <u>Africa</u>		<u>Country of Study</u> <u>North America</u>		<u>Country of Study</u> <u>Europe</u>	
Botswana	40	Barbados	193(1971)	Malta	17
Ghana	242	Canada	54,453	United Kingdom	29,946
Kenya	571	Jamaica	992		<u>(1972)</u>
				Total Europe	<u>29,963</u>
Lesotho	214(1971)	Trinidad and Tobago	370(1970)	<u>Oceania</u>	
Malawi	17	Total America	<u>56,008</u>	Australia	7,672
Mauritius	4			Fiji	157
		<u>Asia</u>			
Nigeria	238(1972)	Bangladesh	150(1971)	New Zealand	2,624
Sierra Leone	303	Cyprus	21	Papua	
				New Guinea	<u>438</u>
Tanzania	282	India	7,804(1970)	Total	
				Oceania	10,891
Zambia	341	Malaysia	59(1972)		
		Singapore	3,599		
		Sri Lanka	<u>41</u>		
Total Africa	<u>2,711</u>	Total Asia	<u>11,817</u>	Grand Total	111,390

Source: (22) Statistics of Students Abroad 1969 - 1973- UNESCO, 1976

APPENDIX IV

Numbers of Commonwealth students enrolled  
abroad in 1971 studying engineering

(by country of origin)

<u>Africa</u>		<u>America</u>		<u>Asia</u>	
Botswana	4	Antigua	22	Brunei	29
Gambia	13	Bahamas	20	Cyprus	662
Ghana	193	Barbados	26	Hong Kong	2,895
Kenya	325	Belize	9	India	5,813
Lesotho	3	Bermuda	10	Malaysia	1,184
Malawi	20	Canada	850	Singapore	425
Mauritius	77	Cayman Islands	8	Sri Lanka	<u>225</u>
				Total Asia	<u>11,263</u>
		Dominica	1		
Nigeria	696	Grenada	30		
Seychelles	2	Guyana	144	<u>Europe</u>	
Sierra Leone	50	St. Lucia	2	Malta	8
Rhodesia	43	Trinidad & Tobago	163	United Kingdom	496
Swaziland	8			Total Europe	<u>504</u>
Tanzania	168	Total America	<u>1,285</u>		
Uganda	137				
Zambia	42	<u>Oceania</u>			
Total Africa	<u>1,781</u>	Australia	151		
		Fiji	42		
		New Zealand	56		
		Papua New Guinea	25		
		Tonga	9		
		Total Oceania	<u>283</u>	Grand Total	15,116

Source: (22) Statistics of Students Abroad 1969 - 1973 - UNE SCO, 1976

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