

**ORGANIZATION OF  
AFRICAN UNITY  
SECRETARIAT**  
P. O. Box 3243

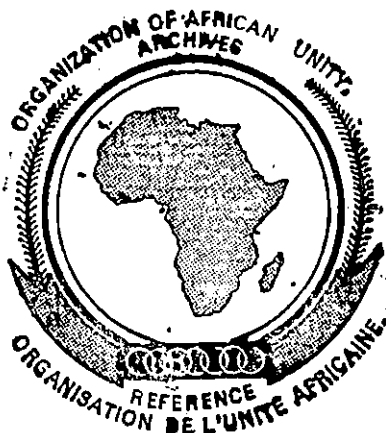
ADDIS ABABA

**ORGANISATION DE L'UNITE  
AFRICAINE  
SECRETARIAT**  
B. P. 3243

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ESTABLISHMENT OF TRAINING  
AND RESEARCH INSTITUTIONS  
(OR CENTRES OF EXCELLENCE)  
IN AFRICA



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Background

1. In keeping with its Charter-given role to co-ordinate and intensify the actions of Member States in various fields, the OAU decided<sup>(1)</sup> in principle in September, 1967, to establish post-graduate Training and Research Institutions (or Centres of Excellence) at which Africans would be given the highest and the best training possible, and at which staff and equipment would be provided to undertake the highest research possible in Africa and to search for new knowledge, in the services of development needs of Member States. The term "Excellence" stems from the fact that it is planned to provide the best African teachers, the best and highest training, the best African research workers that can be secured and the best facilities, equipment, methodology, and services possible. While it is accepted that there are evidences of the negative impact of science and technology on the development of developing countries (for example in the synthetics versus primary products), it is however true and accepted, that on balance, their positive contributions are great, and indeed, a necessary ingredient of accelerated development. But this potential cannot be fully and effectively realised without a growing body of African specialists whose knowledge and skills are directed continuously to the adaptation of modern science and technology and to the search for new knowledge to meet the needs of African States individually and collectively, in terms not only of the natural resources endowment of Africa, but also of environmental and social factors. The fact that adaptation may lead to simplified processes and products means that in many cases the most sophisticated scientific and technological competencies are mastered.

2. The initial fields chosen were eight, and using in some cases the latest more comprehensive titles, these are:

- (i) Geology, Geophysics and Mineralogy (which are  
all included under the Earth Sciences);

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(1) Resolution CM/Res.116(IX)

- (ii) Climatology and Meteorology;
- (iii) Water Resources, Planning and Development;
- (iv) Human Medicine (preventive and social medicine) and Pharmacology (including African medicinal plants);
- (v) Food Science and Technology;
- (vi) Veterinary Science;
- (vii) Applied Science and Engineering;
- (viii) Marine Science and Technology.

That decision to establish Centres of Excellence in these disciplines was taken after it was accepted that accelerated development in economic, social and political fields worked for and aspired to by the citizens of Member States called, among other things, for:

- (a) the effective exploitation of the available natural resources with the best combinations of expert skills, methods and machinery possible. It was noted that these factors of production were not only scarce and expensive, but were mainly imported from abroad - a state of affairs that called for appropriate corrective measures;
- (b) the training of Africans in the required skills, at all levels especially at the highest level in scientific disciplines. Such personnel will not only assist in the effective exploitation and utilization of available natural resources, but also would assist in the process of industrialization within Member States - thus providing employment opportunities which would minimize the "brain drain" from Member States and eventually make the latter producers of their requirements as well as of the machinery needed;
- (c) the general development of higher education and training in Africa, so as to provide local environment to students and scholars; to ensure the orientation of the contents, organization and methods of education and research at the higher levels to local environmental characteristics; and to ensure the effective integration of and maximum contribution from the graduates to their communities; and
- (d) the provision and development of research facilities for assisting to find solutions to problems arising from the development efforts and needs of Member States, and to search for new knowledge that would assist in this process, or which may help to make man more comfortable in, or informed about, his environment.

Consultations(a) With Member States:

3. The OAU has continued to consult Member States on this subject of establishing Centres of Excellence in Africa, either through the fully established organs, that is the Specialized Commissions and the Scientific Council of Africa, or by inviting comments on proposals. When it met in its first session in 1964, the Educational and Cultural Commission called in resolution EDC/28/Res.11(I) for the formulation of programmes for the "accelerated development of scientific and technological education". Also in its first session in 1964, the Scientific, Technical and Research Commission included in its Terms of Reference appearing in resolution STR/35/Res.1(I), an item to enable the OAU "to establish training and research institutions and information centres". Prior to that, and a conference<sup>(2)</sup> jointly sponsored by ECA and UNESCO, in Lagos, Nigeria, in July 1964, it was recommended<sup>(3)</sup> the establishment and development of "a network of national and international scientific institutions of the highest possible standard for training and research in natural resources in Africa.

4. Early in 1967, the General Secretariat circulated proposals<sup>(4)</sup> in preparation for the meetings of the Commissions in May of that year calling for the establishment of Training and Research Institutions (or Centres of Excellence) in four scientific disciplines. The Scientific Council of Africa (CSA) was convened to give scientific advice on this, and on other relevant items that were to be presented to the Commissions. It was the CSA, after accepting the proposals in principle<sup>(5)</sup>, that recommended the increase of the disciplines from four to eight, mainly in order to provide a balanced foundation for scientific and technical training and for research to ensure accelerated development in Member States. Also in its advice, "the CSA agrees that creating these facilities will assist in the problem of training scientific and technical personnel in these disciplines and improve the present desperate shortage of scientific manpower. It observes, however, that these centres are not available in most existing universities and institutions of higher learning in Africa at present, because they are expensive to establish in terms of both capital and recurrent costs".

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(2) International Conference on the Organization of Research and Training in Africa in relation to the study Conservation and Utilization of Natural Resources - 28 July to 6 Aug. 1964, Lagos.

(3) Recommendation 5.B.3

(4) Document ESCHC/4

(5) Recommendation III in document ESCHC/25

5. The Commissions that were to meet in May 1967 did not meet due to unforeseen circumstances. However, the proposal to establish Centres of Excellence in Africa, together with the advice of the CSA, was presented to the Council of Ministers in September of that year, which considered it important enough to require an immediate decision. Accordingly, the Council of Ministers adopted a resolution accepting the proposal in principle, and instructing the Administrative Secretary General "to assemble all the relevant information of the proposal, including details of its costs and possible external aid and report to the Council of Ministers". Immediately after the Assembly of Heads of State and Government approved that resolution, the General Secretariat embarked on, and has continued to carry out, the tasks required of it by that resolution.

6. In the meantime the joint UNESCO/OAU Conference on Education and Scientific and Technical Training in Relation to Development in Africa, was being organized in Nairobi Kenya from 16th to 27th July, 1968. The OAU placed on the agenda of that Conference an item dealing with the establishment of the Centres of Excellence in Africa. Firstly in order that "Ministers of Education and others in Africa who are closely concerned with this matter, should be given a chance to make their views at this early stage<sup>(6)</sup>", and so as to compensate for the gap, resulting from the failure of the relevant Commissions to discuss it. The discussions held, and the comprehensive recommendations made by that Conference amply justify that step of putting that case before the African Ministers of Education, other Ministers and officials connected with national educational services of Member States. A summary of the discussion on this topic which appears in this report as Appendix I, is taken unabridged from the Final Report of that Conference.

7. The Conference confirmed the urgency of the needs, some of which are outlined in paragraph 2 above, which led the OAU into deciding to establish Centres of Excellence in Africa. It, however, observed that there were many problems that would need to be taken care of before and after the proposed Institutions are established. Since the Centres are to serve the development needs of Member States, the Conference called for close and continuing consultations between the Member States and OAU.

As the report on sources and methods of financing the project had not been drawn up (it is expected to be made by a team of experts), the Conference regretted that it could not discuss the financial aspects of this project. Among its other recommendations, the Conference asked the OAU to continue to co-operate closely and effectively with the United Nations and its Agencies and also with individual non-African States which are in a position to assist in any way the early and effective establishment of the required post graduate Training and Research Institutions. The full recommendations of the Conference to the OAU are quoted below:

- "1. The Conference congratulates the OAU on having proposed the the establishment of Centres of Excellence in Africa.
2. The Conference recommends to the OAU:
  - (a) That the initial fields of study mentioned in OAU resolution CM/116(IX) should include the basic sciences, documentation, teaching and research in the social sciences, and such other disciplines as it may deem appropriate;
  - (b) That it should undertake at all stages the necessary preliminary consultations and seek advice from Member States and international organizations and other authorities in implementing the decision to establish Centres of Excellence in Africa;
  - (c) That in formulating their plans for the individual Centres, the proposed teams of consultants should take into account, among other aspects, existing facilities and natural resources potential within Member States in the disciplines concerned, and also the experience in these fields by international organizations and individual States, so as to avoid mistakes that had been made and to gain from successes that had been achieved;
  - (d) That in executing that programme, it should provide adequately for problems, economic, social and political, which may arise from the presence of those Centres of Excellence in Africa;
  - (e) That it should establish a permanent Committee to review continuously the execution of the programme concerning the Centres of Excellence and to co-ordinate their activities and promote their expansion;
  - (f) That it continues to co-operate closely and effectively with the United Nations family of organizations, and individual non-African States which are in a position to assist, in any way, the early and effective establishment of the proposed Centres of Excellence."

These recommendations, especially when read in conjunction with the report of the discussions in Appendix I, are self-explanatory, and the General Secretariat recommends that they should be accepted in full by the OAU.

(b) Consultations and Co-operation with International Organizations

8. (i) In order to ensure concerted and effective action by inter-African organizations, the Economic Commission for Africa was approached and requested to co-operate with the OAU in implementing the programme of establishing Centres of Excellence in Africa. ECA agreed to this. Subsequently, ECA has continued to participate in or to be consulted about all the steps taken and to be taken towards the establishment of the Centres of Excellence in Africa. (ii) The African Development Bank was also requested to consider giving loans for the OAU programme for Centres of Excellence. It is appreciated that the early establishment of the needed Institutions depends on how soon finance can be obtained for that purpose. The ADB has indicated that it would be prepared to consider applications for loans, on a multi-national basis, towards the costs of equipment only. This in itself, is a positive and timely response, which will assist in the financing of the required Institutions. It is hoped to hold discussions with the ADB on this subject in the near future. (iii) The Association of African Universities has also been informed of the programme, and has given it its general support.

9. In January this year, discussions were held with FAO inviting it to co-operate and assist, in any way possible, the OAU programme of establishing Centres of Excellence in Africa, particularly those that come under its terms of reference. The FAO agreed to support the programme within its fields of competence and means. Indeed, FAO has already submitted certain information requested by the General Secretariat, concerning the establishment of Centres for Veterinary Science, Food Science and Technology and Marine Science and Technology.

10. As for UNESCO, they participated actively in the Nairobi Conference in July this year, at which the recommendations quoted in paragraph 7 above were adopted.

Information gathered

11. The General Secretariat continues to gather information on the various aspects of the required Institutions. The organization of this information and the clarification and exposition of concepts and procedures regarding the Centres should now be placed before groups of experts, who, after identifying and filling in any gaps that may be found, will draw up project-plans for individual Institutions for the consideration of the OAU. This step would be in keeping with the careful and cautious approach that this complicated and involved programme calls for.

Next steps in the programme

12. The consultations made so far with Member States, international organizations, and with knowledgeable Africans and non-Africans, indicate that the stage has now been reached for groups of experts to examine all aspects of the individual Institutions to be created, and to offer general advice to and draw up project-plans for the OAU on these. This stage is essential in view of the many facets not only of the programme as a whole, but of each of the eight disciplines chosen. There are problems of estimating more accurately various types of demand for the services of the institutions (whatever shape they may take); of flexible designing of courses and teaching; training and research methods to meet changing needs and conditions; of estimating capital and recurrent costs and of sources of finance and of revenues; of determining programme for the selection and training of African counterparts of higher level staff and even more so, of middle-level technicians of the right calibre, since without these the work of such institutions and of the professionals coming from them would be adversely affected. Wider questions include the effectiveness with which the research output of the institutions could be utilized by member states and the employment opportunities and job satisfaction open to their graduates. This highlights the very important need to create and expand supporting industrial capacity, which would continually absorb and utilize graduates and research results from those Institutions. It is therefore opportune for experts to be asked to draw up project-plans for each of the Centres.



(a) Programming

13. While it is accepted that all the eight disciplines initially agreed upon, are ones in which Member States urgently require highly skilled personnel, it is clear that for several reasons work cannot be begun on all of them at the same time. Some programming over time is unavoidable. To do this, several criteria could be applied. It appears that one of the most important criterion that should be used when drawing up the priority list, is whether or not a given discipline holds a strategic place in the economic (including industrial) and social development of all Member States. A strategic discipline could be said to be one which enables Member States to utilize more effectively and beneficially their natural resources; which in itself would earn foreign currency; and which would create positive and progressive chain-reactions throughout the various sectors of the economy of a given State. Moreover, it is known that work with a considerable bearing on some of the eight disciplines has been or is being undertaken by other (e.g. United Nations) bodies. It is the intention of the Secretariat to take the fullest advantage of this in deciding on an order of priorities. On the basis of these considerations the Secretariat proposes the following order of programming:

- (1) Geology, Geophysics and Mineralogy;  
(which are all included under the  
Earth Sciences)
- (2) Applied Science and Engineering;
- (3) Food Science and Technology;
- (4) Water Resources, Planning and Development;
- (5) Marine Science and Technology;
- (6) Human Medicine and Pharmacology;
- (7) Veterinary Science; and
- (8) Climatology and Meteorology.

It must, however, be emphasized that this order is flexible and open to re-arrangement as and when the state of needs of Member States calls for specific development, and when new disciplines are added to the Centres that are to be established.

(b) Teams of Consultants

14. As mentioned in paragraph 11, it is proposed to establish teams of experts to examine conceptual and operational aspects of each discipline and to draw up project plans, taking into account the points set out in paragraph 12 and 13 above. As further insurance against serious miscalculations it is proposed to begin with one team of experts dealing with item (1): The Earth Sciences with special reference to Geology, Geophysics and Mineralogy. The work and experience of such a team, and the subsequent construction and operation of one Centre would provide a pilot scheme for the rest of the programme. In this way, and through the knowledge and experience gained from the pilot scheme, the subsequent execution of the rest of the programme would gain from the successes already achieved and avoid the pitfalls that may have been met.

15. The size and composition of each team would clearly depend on the scope of the enquiry appropriate to each discipline, and both of these will be affected by work which has already been done by other bodies so as to avoid undesirable and wasteful duplication. Similarly not all members of each team will necessarily be required for the same length of time. In some cases consultants may be required for short periods to provide advice on special problems. The hard case of each team, which the Secretariat intends to keep down to about three experts, will have to travel to Member States to see what Institutions, facilities and services are available or planned in the given discipline and to assess the needs and means of each Member State of the Centre to be established. It will also have to consult appropriately with international organizations, non-African States or individuals who can offer any useful information. It will similarly take into account the information available at the General Secretariat. After obtaining the required information from all possible sources, the team would make recommendations to the OAU, in a form of a blue print for the construction and setting up of the Centre concerned, covering aspects such as curricula, staff, student levels, equipment, ancilliary services, buildings and administrative machinery. The team should also be in a position from the information available to it, to make recommendations to the OAU on sources and methods of financing, and the criteria and suitable sites for the centre. Other relevant

aspects could be added to the team's terms of reference.

16. It is envisaged that working on only one centre, such a team would take about three months to complete its work. The total costs are estimated to be US.\$ 3900 which are broken down as under:

Air travel to and from Addis Ababa (one from Africa US.\$ 200, one from Europe US.\$ 660, and one from USA US.\$ 1,100)	US.\$ 1,960
Air travel in Africa - 39 Member States	4,650
Per diem - average US.\$ 2,000 per person per month	18,000
Salaries - average US.\$ 1,500 per person per month	13,500
Contingencies (terminal expenses, excess buggage, etc.)	890
	<u>US.\$39,000</u>

Recalling the contents of paragraph 8(i) above, the OAU and ECA have been participating jointly in this programme of establishing Centres of Excellence in Africa. In view of the need for effective and concerted action by all concerned in Africa on this programme, it is envisaged that it should now become a joint OAU/ECA programme. Among the many advantages to be obtained from this approach, is that the information already available to ECA on the scientific disciplines concerned can be used. In particular, it is proposed to use the information on Earth sciences (including Geology, Geophysics, and Mineralogy of item (1) of paragraph 13 above), which was obtained by ECA in a recent survey, whose report is expected to be released shortly. To avoid undesirable and wasteful duplication, within the continuing close relationship between OAU and ECA, and seeing that both organizations have the same participating Membership, their joint participation in this programme is a must. Informal discussions have already been held with ECA officials, and there are enough reasons to support the view that, ECA will accept the proposal that the programme of establishing Centres of Excellence in Africa should become a joint OAU/ECA one. Once this step is formally taken, then the work of the team of experts for the Centre for Geology, Geophysics and Mineralogy would in a way, constitute a continuation

of the survey that ECA is now carrying out in Africa on the existing facilities and services in Earth Sciences. Consequently, it is envisaged that OAU and ECA might share the costs of the proposed team of experts for the Centre concerned. The informal discussions that have been held with ECA officials revealed that ECA would accept to contribute a substantial amount towards defraying the total costs of that team of experts. The actual amount will be announced after the formalities over joint OAU/ECA action have been completed. The OAU would contribute only a portion of the total costs involved. With the appointment of a team of experts, if it is approved, the implementation of the programme would enter what could be termed as phase III; Phase II having been the collection of information and the completion of general preliminary consultations with Member States, and Phase I having been the actual decision taking by the OAU, done in September 1967. Therefore, Phase IV would be the beginning of the construction of the first Institution, and Phase V the beginning of training and research at the Centre.

(c) Wider contacts for information and aid

17. While the United Nations and its Specialized Agencies such as FAO, UNESCO, UNICEF, WHO and UNDP are covered either by individual agreements with the OAU or by the overall one between the UN and OAU, there is no similar cover for contacts with non-African governments whose contribution could greatly improve the chances of the early establishment of the required Centres of Excellence. Such contacts would be for aspects such as technical and financial aid, material aid, fellowships or vacancies for the training of staff at existing Institutions of science and technology abroad, and the securing of relevant information. Contacts may also have to be made with the World Bank as an important source of money. A general mandate is therefore required to enable the General Secretariat to initiate these contacts.

Action by Member States

18. It must be appreciated that the training of skilled personnel and the undertaking of research in scientific professions, requires the presence of certain tangible and intangible attributes and atmosphere within Member States. The Nairobi Conference on Education and Training covered most of these. One of the most important of these is the presence or the training of enough middle-grade personnel in technical skills, who act directly or indirectly as supporting staff to the skilled personnel. Without the former, the work of the latter could be hindered and their contribution reduced. Another important requirement is the creation of appropriate and adequate employment opportunities as well as the provision of incentives for the skilled personnel in scientific disciplines vis-a-vis other professions. Without these, the professionals who would come out of the proposed Centres may at best find employment outside their fields of training, i.e. where their contribution is likely to be less, or at at worst they could become frustrated and even leave the country - thus creating a "brain drain". A related aspect, is the building of industries which would not only employ the skilled personnel from the Centres, but also would support and utilize, through their normal operations and production, the research activities carried out at the Centres. The social status, and the earnings of such skilled personnel in scientific professions, requires improvement to make it worthwhile for students to be attracted into and remain employed in these professions. As for the promotion and maintenance of a scientific spirit and atmosphere, the Nairobi Conference recommended<sup>(7)</sup> that Member States should "create among the peoples the motivation which prepares the way for setting up and developing the basic structures that are necessary for introducing scientific and technical innovations". Consumer goods, which are scientifically oriented in operations, should be able to find a ready market. This encourages research in and the production of, better consumer goods - vital incentive to increasing industrial production and expansion. These requirements and attributes would have to be provided, besides the provision of obvious ones. These include the teaching and popularizing of the basic sciences and mathematics at school

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(7) Recommendation on Technical and Vocational Education

in order to supply students for scientific and technical training and in requirements of technology, and particularly for the proposed Centres of Excellence. Also it is vital that all these requirements should be integrated within an overall plan for the economic, social and political development of each State.

### Summary

19. The OAU has taken an invaluable and bold step towards the establishment of Centres of Excellence in Africa from which highly skilled personnel, and research results, will contribute to the national efforts towards accelerated economic, social and political development of Member States. The rising standards of living which the OAU Charter promises the citizens of Member States, can only be achieved rapidly if their human resources can be trained to the level required to exploit effectively and beneficially the available natural resources, and to man productive economic and other services. In accordance with instructions, the General Secretariat has attempted to obtain relevant information from, and create the right atmosphere within, Member States which would enable the desired Centres of Excellence to be established soon in Africa. Similarly, valuable contacts have been established with African organizations and with some of the UN Specialized Agencies. The stage has now been reached for groups of experts to draw up project-plans for the Centres. It is necessary, after agreeing on the programming in establishing the required Centres, to decide on the appointment of a team of experts to draw up a blue print for the establishment of the first Institution. Such an Institution, if established as proposed here would act as a pilot scheme for the rest of the programmes - its successes being emulated and improved upon, and its mistakes being avoided subsequently. The Council of Ministers is therefore invited:

- (1) To receive and accept the recommendations of the joint UNESCO/OAU Conference on Education and Training, held in Nairobi in July, 1968, on Centres of Excellence, and to direct that the Administrative Secretary-General should take appropriate action in these connections;

- (2) To accept the programming according to which the Institutions would be established - it being understood that this can be re-shuffled as and when required;
- (3) To agree to the appointment of a team of three experts at an estimated cost of US.\$ 39,000 to be paid for by OAU and ECA, which would prepare a project-plan for the first Centre to be established, and which will also serve as a pilot scheme for the rest of the projects; and, to direct that the Administrative Secretary-General should present to the Council of Ministers a list of names from which the team will be selected;
- (4) To authorise the Administrative Secretary-General to make appropriate contacts with inter-governmental and non-governmental organizations and with non-African States, which are able to contribute in any way, to the programme of establishing Centres of Excellence in Africa, and to report to the Council of Ministers on such contacts.

THE ESTABLISHMENT OF TRAINING AND  
RESEARCH INSTITUTIONS OR CENTRES OF  
EXCELLENCE IN AFRICA

General Introduction

The Commission was informed that the Organization of African Unity had decided to establish training and research institutions or Centres of Excellence in Africa. That decision followed a careful look at the present and future needs of Member States for the highest qualified personnel specially in scientific and technical professions. The fields initially chosen were eight and these are

- (i) Geology, Geophysics and Mineralogy;
- (ii) Climatology and Meteorology;
- (iii) Hydrology; (1)
- (iv) Human Medicine (Preventive and social medicine) and  
Pharmacology (African medicinal plants);
- (v) Food Science and Technology;
- (vi) Veterinary Medicine; (2)
- (vii) Applied Science and Engineering (previously Physics and  
Mathematics including Electronics and Research in Solar  
Energy);
- (viii) Marine Science and Technology (previously Oceanography,  
Marine Biology and Fisheries).

As presently conceived the proposed Centres of Excellence would provide postgraduate training and research services at the highest level possible and within the context of the needs of Member States. The claim to the word "Excellence" stems from the fact that it is anticipated that these Centres will have the best qualified staff available in Africa and that they will provide the most advanced training and undertake the most advanced research in Africa. Consequently it is anticipated that they will be provided with the best available equipment for training and research purposes and they will employ the best known methods in these fields. The qualifications of the scholars coming out of the Centres will be recognised throughout Africa. Until such a time a common language is established in Africa, provision would be made to enrol

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- (1) Hydrology should now be replaced by Water Resources Planning and Development.
  - (2) Veterinary science will be substituted as the title for this.



in the same institutions English and French speaking scholars and the necessary facilities be provided to enable instructions and research to be carried out in both languages using common facilities.

The discussion of the Commission were based on the following main aspects:

- (1) The purpose of Centres of Excellence;
- (2) The choice of the fields for the Centres of Excellence;
- (3) Problems to be faced in creating them; and
- (4) Programme of action in the establishment of initial ones.

It was agreed that until the reports of the consultants were received it would be better to leave for the time being any discussions concerning the cost of establishing the proposed Centres of Excellence and the sites where they would be located in Africa. Taking now the above four items on which the discussions were based, these are reported on below one by one.

(1) The purpose of Centres of Excellence

The purposes of establishing the proposed Centres of Excellence in Africa are mainly three, i.e.

- (i) the training of highly skilled personnel;
- (ii) the solution of problems that require the application of science and technology in the implementation of economic and social development; and
- (iii) the acquisition of new knowledge in the fields concerned.

Turning to the question of training highly skilled personnel, it was mentioned at the meeting that such personnel, who would be trained under local environment, would assist in filling existing posts and in manning the present services in places such as universities, colleges, research institutions and the productive and the service sectors of economies of Member States. Such persons would also assist in and undertake the planning and execution of programmes which could lead to an accelerated development of the Member States. As for solving problems that hinder or obstruct economic and social development the scholars who would come out of the Centres of Excellence that are to be established

would themselves be required to solve through research, the problems that may have been met either in the industrial exploitation of natural resources or other sectors of the economies of Member States. It is anticipated that such research directed at solving problems would be undertaken at the highest level and with the best equipment and under the best methods possible. It was observed in the discussion of the Commission that while great emphasis would be given to applied research which would be directed at solving known problems, efforts will also be made to promote fundamental or basic research with a view to increasing the volume of new knowledge that is being made continuously available to the states in Africa. The establishment of Centres of Excellence would provide Institutions to which highly qualified African scientists and engineers would be attracted. Many such specialists at present remain abroad in the developed countries for lack of any opportunity to use their knowledge in their own countries. The creation of the Centres of Excellence would reduce this "brain drain".

(2) Choice of disciplines

The Commission learnt that in choosing the fields that had been initially selected, the OAU was guided by among other things the need to produce professional men of high calibre to occupy existing and planned posts in the public and private sectors of the economies of all Member States. It was also considered necessary to provide the required skills for the exploitation of the natural resources within Member States.

Several delegates pointed out that, while accepting the urgent need to provide highly trained personnel in applied scientific fields, it was necessary not to forget the social sciences. It was also pointed out that the social sciences are becoming increasingly important in ensuring that certain needs of man are not ignored and that the training institutions produce citizens who can usefully contribute to the development of their environment. It was also pointed out that it would be necessary to provide for advanced training in pure sciences which would nourish the training provided at Centres of Excellence in applied scientific fields.

Several delegations also mentioned the need to provide within proposed Centres of Excellence, training and research facilities in the application of nuclear energy for peaceful purposes. The Commission was informed that the list of the fields in which Centres of Excellence are to be established which the OAU had initially agreed upon was not meant to be exhaustive, and that, as and when necessary, additional disciplines such as agriculture could be added to it. The Commission took note of this point.

(3) Problems to be faced in creating them

When examining the problems to be faced in the establishment of the proposed Centres of Excellence the Commission observed that there were some difficult aspect that would require to be solved or overcome if the centres are to serve the purpose for which they would be set up and if they are to provide the member states with maximum benefits. Several such problems were touched upon by various delegates. One of these was the problem of scarcity of personnel of a high calibre who would be expected to staff the proposed Centres of Excellence. Some delegates pointed out that if such personnel of high calibre were to be attracted from the national services, this might lead to the slowing down of the pace of development of the member state concerned. It was also pointed out that due to this scarcity and although it was undesirable, it appeared that in the initial stages expatriate personnel may have to be used to serve at the proposed Centres of Excellence. In such cases it was pointed out that such experts should be employed on short contracts with local counterparts to understudy them and eventually take over from them. In this connection also it was mentioned that an increasing number of fellowships will be necessary to enable African scholars to acquire the required level or degree of training and on undertaking research so as to be able to serve at the proposed Centres of Excellence. It was also emphasized that these Centres of Excellence should not only undertake the highest training possible, but also that at an appropriate time, they should train or at least assist in the training of middle-grade personnel in the scientific disciplines concerned. Concern was expressed that the Commission had not been permitted to go into the financing and location of these centres which, it was considered, was an essential element of the Commission's deliberations.

A number of problems were raised which are mainly political in nature. Some delegates expressed the fear that in the event of differences arising between some member states one of which may be playing host to a given centre, it would be necessary to ensure that the vacancies available to the state which may be at variance with the host state should be guaranteed. It was also pointed out that the centres, including the students, the staff members and their work should also be insulated from differences of this kind. Another problem of a political nature that was raised in the Commission was that due care should be taken to avoid the proposed centres being located only in the African states that are comparatively developed while ignoring those which are less developed. This could lead to a slower development in the latter countries while those that are comparatively better off will continue to be more developed. The Commission felt that political problems of this kind must be taken into account and suitable solutions found before the proposed Centres of Excellence are established.

Another problem that could arise is that of employment opportunities for the scholars coming from the proposed Centres of Excellence. It was indicated that since some of them would already be employed in existing industries, universities or research institutions or other productive sectors of the economies of member states, such persons would merely return to their posts at the end of their period at the centres. In any case, scholars from such centres would easily find employment at existing and planned universities and colleges and in advanced research institutions. Also as the member states industrialize and become generally more developed, employment opportunities will arise from time to time for such personnel of the high calibre expected. These were among the problems that were mentioned during the discussions in the Commissions on the subject.

(4) Programme of action in the establishment of initial centres

It was pointed out that it would be necessary for OAU to establish as soon as possible, adequate machinery under which the whole programme of establishing and developing the required Centres of Excellence would be continuously reviewed and assessed. Some delegates also pointed out that in view of the size of Africa and also in view of the language problem it may be necessary to establish more than one Centre of Excellence

in any one scientific discipline. Some delegates pointed out that the OAU should be requested to study the experience of international organizations such as Unesco and individual countries in the running of similar centres. Lessons learnt by these sources in establishing Centres of Excellence would prove fruitful in Africa as a precautionary measure in avoiding mistakes. Several delegates also requested that the problem of establishing Centres of Excellence in Africa should take into account the fact that it would be necessary to provide adequate staff and facilities to cater for the needs of all participating states. It would be disastrous if any particular member state was informed that its request for services could not be met for lack of staff or facilities. Some delegates also requested that it would be necessary to establish machinery for executing results of research that may be forthcoming from some of the Centres. It was further emphasized that for the Centres of Excellence to operate effectively and successfully, it was necessary to ensure that there were adequate institutions, services and activities which would assist in identifying problems that required advanced treatment at the proposed Centres of Excellence.

Finally some delegates requested that in executing the programme of establishing Centres of Excellence in Africa, we should proceed cautiously so as to avoid disastrous results. It may be necessary to start one or two Centres for purposes of obtaining experience before embarking on the rest of the programme.

#### General

Several delegates commented on the criteria that could be used in selecting the sites at which the Centres will be located. One of these would be the natural resources potential of the area. It was pointed out that the right scientific environment and certain volume of activities were necessary to support each of the Centres at the places that they will be located. It was also indicated that because of the need to reduce the costs of establishing Centres of Excellence, it may be necessary to develop them from existing universities. It was generally accepted that in carrying out the programme of establishing Centres of Excellence in Africa, it will be necessary for the OAU to co-operate very closely with the UN family or organizations and also with

other friendly outside sources of funds and information. It was also agreed that it was necessary to continue tapping all sources of expertise known on this subject both from Africa and outside, in order to ensure early and effective implementation of the OAU decision. This is particularly necessary when it is realised that the proposed Centres of Excellence are part of the infrastructure which member states hope to build and from which they will obtain the necessary skilled personnel for, and solution to problems arising from, their efforts to develop as quickly as possible.



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# Establishment of training and research institution (or Center of Excellence) in Africa

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