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# GENERAL REVIEW OF THE DEVELOPMENT, CO-ORDINATION AND CONCENTRATION OF THE ECONOMIC, SOCIAL AND HUMAN RIGHTS PROGRAMMES AND ACTIVITIES OF THE UNITED NATIONS AND THE SPECIALIZED AGENCIES AS A WHOLE

## Twenty-fifth report of the Administrative Committee on Co-ordination to the Economic and Social Council

## Addendum

# ANNEX I

## RESPONSIBILITIES AND ACTIVITIES OF THE VARIOUS ORGANIZATIONS IN THE FIELD OF EDUCATION AND TRAINING IN AFRICA

(1961-1962)

# UNITED NATIONS

1. The training programmes of the United Nations in Africa encompass a wide range of activities corresponding to regular United Nations substantive responsibilities in the following fields: general economics and development planning, fiscal and financial policy, public administration, statistics, industrial development, the development of resources and transport, housing, building and planning, community development, demography, social services and social defence.

2. A variety of different methods of training are employed, including individual or group fellowships abroad, in-service training within the United Nations (Headquarters, E.C.A., etc.), the organisation or strengthening of national, regional and sub-regional training institutes or centres, the planning and execution of study tours, workshops and seminars, and the organising of training by individual experts sent either for this express purpose or in order to deal with specific problems requiring trained people for their solution.

3. Factual information on current (1960) United Nations training activities for Africa and on concrete projects and plans for African training in 1961-62 is briefly summarised below.

## I. CURRENT ACTIVITIES (1960)

4. The resources derived from the regular and expanded programmes of technical assistance and directly expended on African training activities in 1960 amounted to just under half a million dollars ($475,000), of which $105,000 was devoted to fellowships and $370,000 to regional and national training institutes, centres and study tours. These figures do not include the training activities of technical assistance and O.P.E.X. experts, U.N.I.C.E.F. training programmes relating to its child and maternal welfare services (see separate paper), nor the special fellowship programme for the Congo financed by the U.N. Congo Fund.

### (a) Fellowships

5. During 1960, a total of 74 fellowships were awarded to Africans by the U.N. under the expanded and regular programmes. The awards were made in all of the fields indicated above.

Fellowship holders came from the following countries: Cameroun, Congo (Leopoldville), Congo (Brazzaville), Ethiopia, Ghana, Guinea, Liberia, Libya, Morocco, Nigeria, Somalia, Sudan, Togo, Tunisia, Uganda, Union of South Africa and United Arab Republic.

6. Reference should also be made to the Fellowship Programme in the Congo under which 80 Congolese trainees had, by 31 December 1960, already left for studies abroad under grants financed by the U.N. Congo Fund and through the facilities of I.L.O., W.H.O., W.M.O. and I.T.U. In addition, up to 31 December 1960, 119 fellowships had been granted through the U.N. for study abroad under bilateral programmes in some 28 different fields.

(b) Training Institutes, Centres and Study Tours

7. Training Programme for African Government Economists: Each year since 1957, a six-month training programme for African Government economists has been held at U.N. Headquarters in New York. The African officials receive an intensive course in economic development and administration. The lecturing staff is drawn mainly from the U.N. Secretariat. Thus far, 50 trainees have participated in the programme. Field trips are arranged to appropriate governmental agencies, banks, business enterprises, factories, universities and schools and to a few neighbouring countries. At the conclusion of their programme, the participants make a brief visit to G.A.T.T., I.L.O. and W.H.O. in Geneva and a longer one to E.C.A. in Addis Ababa.

8. Institute of Public Administration (Cairo): The Institute was established in 1955 to provide in-service training programmes for civil servants. Four experts have been provided each year under the E.P.T.A. At the initial stages the co-ordinator of the Institute and the full-time lecturers were recruited internationally. At present, most of the teaching staff is provided by the Government. Thus far, 2,592 trainees have completed courses at the Institute.

9. The Imperial Ethiopian Institute of Public Administration: This Institute has provided in-service training for about 200 civil servants. The major financial support has come from the Government. The Director and teaching staff have been provided by the U.N.

10. School of Public Administration (Libya): This school was established with U.N. technical assistance aid in 1957. Three experts have been provided each year. Approximately 40 students are admitted to each year's training and since January 1957, 147 students have participated in the programme. The Director

and entire teaching staff of the school has been provided by the U.N. although it is planned that Libyan nationals will assume additional responsibilities and that five teachers will be provided by the Government.

11. Public Administration Training Institute (Sudan): The United Nations furnished the Director of this Institute and an organisation and methods instructor in 1960 and will supplement this assistance with two further instructors in 1961 in personnel management and civil service training: 89 students have already received training.

12. In the Congo the United Nations is co-operating in the establishment of a broad range of training courses, either through existing institutions or by ad hoc arrangements.

(c) Study Tours, Workshops, etc.

13. In addition to the above continuing programmes and activities, reference should be made to the Community Development Study Tour and the Workshop on Family and Child Welfare which were held in African countries in 1960, the provision of technical assistance experts with primary responsibilities for training and the activities of a number of O.P.E.X. experts in African countries, each of whom has a clear mandate to train a government counterpart or successor

## II. PROJECTS AND PLANS (FOR 1961-1962)

14. Under General Assembly resolution 1527 (XV) on assistance to newly independent states and in implementation of the current work programme of the Economic Commission for Africa, a considerable expansion of United Nations training activities in Africa is already under way. Such an expansion is rendered possible by the additional resources available from the Expanded Programme of Technical Assistance as well as from the increase of $3,500,000 in the Regular United Nations Budget for 1961 for assistance to newly independent states. Some indications of the general direction of these expanded activities over the next two years are given below:

(a) Fellowships

15. Under the Expanded Programme of Technical Assistance, the Category I Programme includes a total of 106 fellowships to be awarded to trainees from almost all countries and territories in Africa, ranging across all the fields of U.N. substantive responsibility indicated above.

16. It is expected that twice or possibly as much as three times this number of fellowships again (300) will be awarded to African trainees under the regular United Nations programmes of technical assistance in 1961-62.

17. In addition to this estimated total of between 300 and 400 United Nations fellowship awards to Africans under the expanded and regular programmes for 1961-62, it is expected that there will be a substantial number of further fellowships for Congolese arranged and financed by the U.N. Congo Fund.

(b) National Training Institutes and Facilities

(i) Continuation of Present Assistance

18. It is anticipated that United Nations assistance will continue at about the present level throughout 1961-62 to the four national institutes of public administration, details of which have been given above.

19. The Government of Ghana has requested the service of two experts in civil service training for 1961 to assist in establishing an Institute of Public Administration in 1962.

(ii) New and Anticipated Requests

20. From the requests and indications of interest expressed by the eight newly independent countries, referred to in the Secretary-General's report to the General Assembly (A/4585, Annex), it is evident that an important part of United Nations technical assistance efforts and activities in Africa in 1961-62 will be devoted to the establishment of new or the strengthening of existing national training institutions and centres in specific fields. Four countries (Cameroun, Dahomey, Niger and Nigeria) have requested the services of public administration experts to explore the possibilities of establishing or strengthening public administration institutes.

21. Two countries (Niger and Nigeria) have requested assistance in the organisation or staffing of national statistical institutes for the training of government statisticians.

22. Expert assistance and training facilities for auditors and accountants and for officials concerned with fiscal policies (including credit and insurance) have been received from several countries.

23. Assistance and advice has also been requested in the establishment of demonstration projects in low-cost housing, and of projects for the training of community development and other workers in the social field.

(c) Regional Projects

24. The following regional projects for 1961-62 which are included in the E.C.A. draft work-programme, or which have reached an advanced stage of consideration or preparation as technical assistance projects, may be cited by way of illustration:

(i) Training Programme for African Government Economists at U.N. Headquarters

(In continuation of the programme in operation since 1957, details of which are given above).

(ii) Training in Economic and Social Planning at E.C.A. Headquarters

An intensive programme of study and training designed to meet the need for an increasing number of economists, statisticians, public administrators and managers of industry who are able to handle the problems and techniques of development programming.

(iii) In-Service Training for African Economists and Statisticians at E.C.E. and E.C.A.F.E.

Small programmes at E.C.E. and E.C.A.F.E. Headquarters to supplement the in-service training programmes for African Government economists at U.N. Headquarters and in the E.C.A.

(iv) Training Activities in Statistics

The training programme in statistics in Africa, already approved for 1961-62, amounts roughly to $171,000 each year, not counting contributions in kind by E.C.A. and the U.N. Statistical Office. Four regional and sub-regional training centres are in the process of being established at Addis Ababa, Accra, Rabat and in a suitable location in one of the French Community countries of West Africa.

(v) Training in Community Development Methods and Techniques.

(a) Refresher training courses to be organised at sub-regional and national levels for national personnel such as provincial community development officers, principals of training centres, etc.

(b) Study tour for senior officials of requesting governments to visit community development projects in selected Asian countries in 1962.

(vi) Training in Housing, Building and Planning

(a) Assistance to be provided to governments for the establishment of training centres and courses for housing, building and town and regional planning at varying technological levels.

(b) Group Fellowships and Workshops (in Scandinavian Countries).

(vii) Regional Seminar on Administrative Problems of African Governments (1962)

(To be prepared by group of experts in public administration and fiscal and financial administration in West Africa).

(viii) Budget Workshop for Africa (1961)

Designed for treasury officials and economists from countries of the region, the workshop would deal with problems of improving information on the public sector for purposes of economic planning and with problems of improving budget classification and administration.

(ix) Seminars in Industry, Transport and Natural Resources

Category I budget provision has been made for one seminar in 1961; Category II provision for one seminar in 1962. Precise plans and agendas will depend upon the expressions of government interest.

(x) Ports and Shipping Seminar for African Countries

Following the experience of a Ports and Shipping Training Centre for the Arab States (held in 1959 in Copenhagen), it is proposed to hold a similar seminar in Copenhagen in 1961 with 30-35 participants from African countries.

(xi) Training Facilities in the Field of Economic Development

A more general project, included in the current work-programme of the Economic Commission for Africa, calls for consultations with universities, research institutions and

other appropriate organisations in Africa regarding arrangements for the training of African staff in the field of economic development. The first such consultation was held in Khartoum last December.

(xii) Training for Foreign Service Officers

The Government of Sudan has requested the United Nations to organise a training programme for foreign service officers. The implementation of this request is now under study.

(d) Resources Available for United Nations Training Programmes for Africa

25. On the basis of the 1960 level of resources of the Expanded and Regular Programmes of technical assistance, a total expenditure of $1,300,000 has already been authorised for United Nations training activities for Africa in the two years 1961-62. (Fellowships - $290,000, Regional and National Training Institutes, Centres, Study Tours - $1,010,000).

26. As a result of recent increases in the level of the Expanded Programme and the decisions of the Technical Assistance Committee regarding the supplementary Category I programme for newly independent countries, an additional $3,000,000 has been approved for United Nations technical assistance activities for these countries in 1961-62. To this must be added the increase of $3,500,000 in the regular United Nations Budget for 1961 for assistance to newly independent countries in Africa.

27. In the light of requests already received, it is estimated that a substantial part of these supplementary resources - at least one-third and possibly as much as one-half - will be devoted to training. This would indicate a total possible expenditure in 1961 alone of between 2 1/2 and 3 million dollars for training activities under the United Nations programmes of technical assistance to Africa. The above total does not include resources available from the Special Fund for projects in which the United Nations is now or may in the future be designated as the executing agency such as the establishment of major institutes in Africa, to be devoted in whole or in part to training in fields of primary concern to the United Nations.

INTERNATIONAL LABOUR ORGANISATION

28. The constitutional texts which govern all I.L.O. activities assign important tasks to the I.L.O. in the field of training. The scope of these tasks has increased considerably since the end of the Second World War. The I.L.O. has indeed always maintained that training lies at the root of problems of economic underdevelopment, since it is the capacity of people to produce, administer, manage and direct that is the basic factor in development and, in consequence, one of the prerequisites for social progress.

29. Training activities - especially those relating to technical and vocational training - have therefore come to occupy an increasingly important place in the operational programmes of the I.L.O. When it was proposed to intensify the work already being carried on by the I.L.O. in Africa in all its fields of competence, the Organisation immediately asked its African Advisory Committee (Luanda, 30 November -10 December 1959) to consider the question of vocational and technical training. In the following year, at the First African Regional Conference of the I.L.O. (Lagos, December 1960) this question, which had been placed on the agenda, dominated the discussions and led to the adoption of a resolution which constitutes, as it were, the practical charter of future I.L.O. activities in Africa in this field.

30. During the period 1961-62 the operational activities of the I.L.O. in Africa will continue to relate in the first place to technical and vocational training of industrial workers. The work of the I.L.O. in each country - whether it concerns the training of young persons (youths and girls) or adults for a particular trade, the improvement or adaptation of the qualifications of workers already in employment or the training of instructors - will be designed to have a "snowball" effect and to produce rapid progress in vital sectors of industry where there is a shortage of trained workers or supervisors. The I.L.O. will therefore concentrate in particular on projects relating to training of instructors - which appears to be the key to all progress in the field of training, whether it be provided in specialised training centres or in industry - organisation and planning of training at the national or even the regional level, training in supervisory functions - which is also essential to improve the qualifications of African workers - training of technicians, accelerated training of adult workers - which will not obviate the need for normal training arrangements in African countries but will play an important part in facilitating the economic "take-off" - and apprenticeship training. The activities of

The I.L.O. in all these branches of training will have to be very flexible, and the methods and institutions recommended will vary considerably, depending on local conditions. It will very often be advisable to suggest the establishment of multi-purpose bodies which can cover several branches of industry and also cater for other sectors of the economy. The assistance rendered will include provision of experts, supply of equipment, granting of fellowships and organisation of national or regional courses and seminars. Under the Expanded Programme the I.L.O. will carry out, in 1961-1962, 17 projects of this kind, involving the provision of 46 experts, the supply of equipment to the value of $8,700 and the award of 14 fellowships. In addition, the Special Fund has approved a vocational training project to be carried out in the United Arab Republic which entails the expenditure of $888.100 over a four-year period. Other projects are being considered by the Fund; they concern the Ivory Coast, Morocco, Nigeria, Senegal and Tunisia. Finally, various projects will be financed under the regular I.L.O. budget.

31. The I.L.O. will also be concerned with <u>training of supervisors and improvement of labour productivity</u> in branches of industry where the need is greatest. The training programmes will include short-term and long-term measures. Short-term action will be designed to develop the capacity of Africans who already hold responsible posts in industry and to teach them techniques for improving labour productivity; to this end, regional centres, or even national centres which might accept some trainees from neighbouring countries, may be established after the needs in this field have been assessed. Long-term action will be designed to train Africans for managerial and other responsible posts in industry; the specialised centres previously established may be used for this purpose. These activities will be supplemented by training courses, seminars and fellowships. Two projects of this kind will be financed under the Expanded Programme in 1961-1962.

32. The International Labour Conference, at its 45th Session (Geneva, June 1960), and the African Regional Conference (Lagos, December 1960) stressed the role which the I.L.O. must play in the rural sector and which is particularly important because the majority of African countries have a predominantly agricultural economy. In the field of <u>vocational training in agriculture</u> I.L.O. action will, as in the case of industry, be closely linked with the systematic assessment of resources and needs of supervisory personnel and skilled manpower. It will take into account both these needs and current trends with regard to training institutions and methods. The I.L.O. will also study, assess and, as appropriate, disseminate information concerning, the efforts now

being made in Africa to bring the benefits of technical progress to farmers and agricultural communities. Finally, it will continue to be concerned with the training of personnel responsible for the use, maintenance and repair of agricultural machinery, the training of forestry workers and the establishment of agricultural productivity centres to seek the best methods of increasing labour efficiency and, in particular, the efficiency of plantation workers. In general, the I.L.O. will participate in all activities in the field of vocational training in agriculture arising from the memorandum of agreement recently drawn up by representatives of I.L.O., U.N.E.S.C.O. and F.A.O. concerning the work of the three organisations in Africa and other parts of the world.

33. Small-scale industries and handicrafts can play an important part in ensuring balanced and harmonious economic and social development in African countries. One way in which the I.L.O. can assist in this field is by helping governments to give appropriate vocational training to persons who will be responsible for the planning, development and supervision of this sector of he economy, to instructors in the various branches in this sector, to the personnel of undertakings (supervisors and workers) and to the various extension workers and promoters responsible for facilitating development of these activities. The most comprehensive form of assistance will be the establishment of small-scale industries institutes of a very flexible type which will combine training with research and advice in this field. When it is not possible to establish such institutes, the I.L.O. will be prepared to advise governments, in co-operation with the other international organisations concerned, as to the best means of providing desirable vocational training. Several African countries have asked the I.L.O. for assistance in one form or another in this field.

34. Similar assistance will be provided by the I.L.O. with regard to vocational training in the field of co-operation. Centres to train the personnel responsible, at various levels, for the development and supervision of co-operative activities, the staff of the co-operatives and the leaders and members of the co-operative movement may be established in several countries. Projects of this type are under consideration for the following countries: Cameroun, Central African Republic, Ivory Coast, Madagascar, Mali, Niger, Nigeria, Tanganyika, Togo, Tunisia and Upper Volta.

35. The shortage of qualified office personnel conversant with modern techniques - both in industry and commerce and in public administration - is a serious obstacle to the economic and social development of African countries. A number of

these countries have already asked the I.L.O. to help provide suitable vocational training for such personnel. This assistance may either be given separately or linked with assistance in the industrial field. It may take the form of permanent training centres for young persons, accelerated vocational training centres for adults, or courses to improve the qualifications of persons in employment. As in other sectors, training would sometimes be supplemented by fellowships for study abroad. A project of this type will shortly be undertaken in Ethiopia; another, relating to the Congo (Leopoldville), is under consideration.

36. Similar steps will be taken with respect to training of labour administrators. The I.L.O. will recommend the establishment of permanent national training centres for officials of labour administrations, national accelerated training and upgrading courses and regional seminars. The training received will be supplemented, as appropriate, by fellowships. The I.L.O. will organise two regional seminars in 1961 and 1962 for French-speaking and English-speaking countries and territories respectively. It will also carry out a project at the national level in the Congo (Leopoldville).

37. In yet other fields, such as social security, occupational safety and health, workers' education, which is essential to the harmonious social development of African countries, and labour-management relations, the I.L.O. will undertake, within the limits of its resources, action designed mainly to ensure suitable training for persons with high-level responsibilities. Approximately $60,000 will be devoted by the I.L.O. to workers' education in Africa in 1961-1962 under the regular budget.

38. Finally, the I.L.O. will place at the disposal of Africans from government, occupational and university circles and other African students its International Institute for Labour Studies where, in an atmosphere of objective research and study, problems will be considered and ideas, institutions and methods compared.

39. For the years 1961-1962 the total expenditure on I.L.O. operational activities in the above-mentioned fields (with the exception of the International Institute for Labour Studies) will be as follows:

| | Dollars |
|---|---|
| Expanded Technical Assistance Programme: | 1,500,000 |
| Special Fund[1]: | 2,200,000 |
| Regular operational programme (1961 only): | 132,000 |

[1] Total cost of the projects already approved for Africa or to be submitted to the Governing Council of the Special Fund for approval in May 1961.

# FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

## Agricultural* Education and Training in Africa

### I. Interest and Responsibilities of F.A.O. in Education and Training

40. F.A.O. has special interests and responsibilities in promoting the development of the agricultural sector of the economy and in the improvement of levels of living in rural areas. The lack of sufficient numbers of appropriately educated and trained personnel, including farmers, is increasingly recognised as a major problem to be dealt with in discharging these responsibilities. It is to the solution of this problem that F.A.O.'s large and diversified staff, including specialists in all aspects of "food and agriculture", is devoting a major portion of its energies.

41. The work of F.A.O. in the field of education and training involves assistance to member governments in two important areas. (1) Determination of quantitative and qualitative requirements for agriculturally educated and trained personnel and the development of national systems and institutions for providing such education and training; and (2) development of staff, facilities and programmes in all of the specialised food and agriculture fields - land and water development, statistics, economic analysis, forestry and forest products, commodities, plant production and protection, nutrition, animal production and health, fisheries and rural institutions and services.

42. Requirements for agriculturally educated and trained personnel and the development of a national system or organisation for preparation of such personnel cannot be considered completely independently of total manpower requirements and the

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* Used in the sense of applying to all of the fields of food and agriculture in which F.A.O. works - Land and Water Development, Plant Production and Protection, Animal Production and Health, Forestry and Forest Products, Fisheries, Nutrition, Economic Analysis, Commodities, Statistics and Rural Institutions and Services.

organisation for education and training as a whole. Closest co-operation between F.A.O. and I.L.O. in respect of the former and between F.A.O. and U.N.E.S.C.O. in respect of the latter are essential. Similarly, the provision of the specialised education and training to which reference is made here presumes the existence of an adequate general education or scientific base. It is accordingly clear that for certain types of education or training activities, U.N.E.S.C.O. assistance may precede or accompany help from F.A.O.

## II. Approved and Proposed Programmes for 1961-62.

43. F.A.O. draws resources for its education and training programme in Africa from several sources: the Regular Programme Budget, the Expanded Technical Assistance Programme, the United Nations Special Fund, U.N.I.C.E.F. and Funds-in-Trust established by Member Governments. The budgetary periods, for which funds are made available from these different sources do not coincide. In particular, the time period covered by this report involves the Regular Programme budgets of F.A.O. for two periods 1960-61 and 1962-63. The Programme for 1961 is approved but at the time it was prepared, F.A.O.'s work in Africa was only beginning. A supplementary effort in African agricultural education and training for 1961 is therefore planned. Proposals for 1962 have also been formulated for consideration at the November 1961 Session of the F.A.O. Conference. In the following section programmes already approved are described separately from those still in the proposal stage.

### A. Approved Programmes

44. Field programmes financed by E.T.A.P., U.N.I.C.E.F. and Funds-in-Trust now in operation or approved for 1961-62 include 39 experts, 140 fellowships and some 17 training centres or seminars. The experts to which reference is made are those who devote full time to education and training. It is to be noted that, in addition, practically all experts assigned under the Technical Assistance Programme devote a substantial portion of their time to training. The above described field programme is backstopped technically by a large number of F.A.O.'s permanent Headquarters and Regional Office staff. These same staff members also carry out surveys of training requirements, advise governments on education and training problems, assist in preparation of requests and plans of operations for Special Fund financed projects, recruit and supervise field personnel, plan and conduct training centres and seminars. Space does not permit a detailed analysis of the very substantial volume of education and training work done by these permanent staff members and financed by the F.A.O. Regular Programme budget.

45. Two education and training projects for Africa have been approved by the Special Fund: (1) establishment of a College of Agriculture in Liberia, and (2) establishment of a Veterinary Assistants Training School in Ethiopia. A total of 11 experts will be supplied, for periods up to six years, and 17 fellowships will be granted for these two projects.

B. Proposed Programme

46. As indicated immediately above, certain Headquarters and Regional Office staff time and resources are made available in the approved 1961 Regular Programme and Budget to support and supplement field education and training programmes in Africa. Provision for similar support in 1962 is included in the proposed 1962-63 programme to be considered by the F.A.O. Conference in November in this year.

47. The general provision included in the approved 1961, and proposed Regular Programme budget for 1962, is inadequate to enable F.A.O. to discharge its responsibilities in an integrated agency programme of education and training for Africa. Action is, therefore, planned to supplement this general provision.

48. For the remainder of 1961, a consultant will be appointed to continue the African agricultural education and training planning effort initiated with the despatch to African Member Governments, in October 1960, of a questionnaire on requirements for assistance in agricultural education and training. Further assistance to the African programme will be given by a permanent agricultural education staff member to be appointed in the near future.

49. The F.A.O. Conference meeting in November 1961 will be asked to consider for 1962-63 a supplementary programme for education and training in Africa. The proposed supplementary programme is of a two-fold nature involving assistance in: (1) planning and strengthening the permanent national organisation, staff, institutions and programmes for agricultural education and training; and (2) meeting the short-term need for emergency preparation of, or improvement in performance of already employed, personnel in ministries and other agencies concerned with agricultural development and improved levels of living for the rural population.

50. The proposed F.A.O. assistance described above would be supplemented by a number of Special Fund projects, in education and training, which may be approved during 1961 and 1962. Included among the projects now under consideration by the Fund or likely to be submitted by African governments during 1961 and 1962 are the following:

1. Sudan - establishment of Forest Research Institute and strengthening of Forest Rangers School with eventual Establishment of Forestry Faculty.

2. Nigeria - establishment of a Forestry Faculty in Ibadan University College.

3. U.A.R. - establishment of Training and Research Institute in Agricultural Statistics.

4. U.A.R. - establishment of a unit for Training in Agricultural Planning in the Institute of National Planning.

5. Ghana - establishment of an Institute for Food Science and Nutrition.

6. Ivory Coast - establishment of an Institute for Food Science and Nutrition.

7. Various African Countries - in response to an F.A.O. questionnaire on education and training requirements, a number of countries have indicated their intention to establish agricultural schools or faculties including plant, animal and forestry fields.

## UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

51. U.N.E.S.C.O. is vitally concerned with the development of education, broadly conceived, in the framework of the economic and social developments which are proceeding at an accelerated pace in Africa. A Conference of Ministers and Directors of Education of Tropical African countries held in Addis Ababa from 16 to 20 February 1960, drafted some proposals for the implementation of both short-term and long-term programmes in education in which U.N.E.S.C.O. and other United Nations agencies could effectively take part. It is on the basis of these proposals and later developments that the General Conference of U.N.E.S.C.O., at its 11th Session (November-December 1960), approved and gave a high priority to its Africa programme.

52. At the basis of this U.N.E.S.C.O. programme is a recognition of the need for planning of suitable educational programmes, locally, nationally and regionally. In order to implement such planning, a Conference of African States will be held in Addis Ababa on 15-25 May 1961, under the joint auspices of U.N.E.S.C.O. and the United Nations Economic Commission for Africa and with the co-operation of other interested organisations of the United Nations system. This will give special emphasis to establishing "an inventory of educational needs" in the light of changing economic and social development. Background data papers for this Conference are being prepared by well-qualified consultants, by various organisations of the United Nations system and by the U.N.E.S.C.O. secretariat. Useful for this purpose are the conclusions of a series of more specialised meetings convened and organised recently by U.N.E.S.C.O., e.g. the Regional Seminar for Africa on the International Standardisation of Educational Statistics (Khartoum, December 1959), the Seminar on Vocational Education (Accra, April 1960), the Meeting of Experts on Educational Opportunities for Girls in Africa (Cotonou, May 1960), and the Meeting of Experts on the Teaching of Science in Tropical Africa (Abidjan, December 1960). It is hoped that the forthcoming Addis Ababa Conference will result in establishing the broad lines of a programme for national, regional and international action in order to meet some of the educational needs in the coming years.

53. In addition to this general meeting, U.N.E.S.C.O. is sponsoring detailed surveys by teams of experts of educational needs in three African nations in 1961-62. Wherever possible these educational surveys will be co-ordinated with surveys

being conducted on other phases of the national economy and society. These will provide the substance for three-month long seminars for educational administrators on the processes of educational planning.

54. Two specific problems of major importance in African education are at the same time being attacked by U.N.E.S.C.O. The first is the need for suitable textbooks. A Bureau to study these needs and to evaluate possible solutions will be established in Africa in 1961. This will be shortly followed by the establishment of a Textbook Production Centre, financed in part by voluntary contributions provided under the new emergency programme of U.N.E.S.C.O. for Africa. The same resources will be used to establish a School Building Planning Centre to help meet the other major problem - the need for adequate school buildings.

55. It is obvious that the existing educational systems of Africa must be strengthened, bearing in mind the necessity for developing systems balanced in all their parts. Of fundamental importance is the training of primary school teachers. This in turn depends upon the further development of teachers for the teachers. As another part of its Africa Emergency Programme, U.N.E.S.C.O. is planning in 1961-62 to establish two centres - one in an English-speaking and one in a French-speaking country to be operated on a regional basis for further development of the staffs of training colleges for Primary School teachers. These centres will also conduct research in the field of teacher training for Africa and be concerned, along with other groups, in the production of appropriate teaching aids.

56. In the field of secondary education U.N.E.S.C.O. is acting as the executing agency for the Special Fund in a number of projects for the establishment of training colleges for secondary school staff. Of these projects, a Federal College in Lagos, Nigeria, has received the approval of the Governing Council of the Special Fund, and plans of operation have been submitted for Colleges in the Sudan, Ivory Coast, Cameroun and Congo (Brazzaville), this last a regional project catering also for Gabon, Chad and the Central African Republic. Outline proposals for similar colleges in the Northern, Eastern and Western regions of Nigeria are now with the secretariat of the Special Fund. All these projects involve the provision of technical assistance in planning and of staff, equipment and fellowships, for operation.

57. A seminar on the adaptation of the curricula of secondary schools to the interests and environment of African pupils will be held in 1962, preceded by studies on research in this field already in progress in Africa and on the major problems involved. The curricula of primary schools will also be under

consideration, since they are the foundation of later programmes. Of special concern is the teaching of modern science and mathematics in African schools since these are basic to further technical and vocational education in light of the changing economies of Africa.

58. A number of Member States have requested U.N.E.S.C.O.'s assistance in supplying staff at the secondary, general and technical level, a service to which other Member States are already contributing. U.N.E.S.C.O., under its Emergency Programme, will develop both a recruiting service to receive and distribute this form of assistance from Member States and also an "OPEX type" operation in which recipient States will make a direct contribution to salary at local rates, and also plan and pay for the higher training of their own nationals.

59. A regional conference of heads of institutions of higher education, including technological institutes, will be convened in 1962. The conference will examine the development of African universities and the contribution they are making to economic and social progress. It will also assess the most urgent needs of the region for teachers, research workers, and professional personnel for economic development, and make recommendations as to how these needs can be met.

60. In the field of adult education, a workshop of specialists in the production of reading materials for new literates will be held in 1962, after suitable studies have been made in 1961. The workshop will bring together authors, translators, editors, illustrators and publishers to discuss the problems involved.

61. A course for leaders of out-of-school activities for women to be held in 1962, will follow up the work of the meeting of experts in Dahomey (1960), comparing experiments already made and the results already obtained, particularly in the field of civic education for women.

62. In addition to these educational programmes U.N.E.S.C.O. will during 1961-62 carry on a technical assistance programme which will provide to the nations of Africa 131 man-years of service, $178,000 of modern equipment and 143 fellowships for Africans to study abroad as a sequel to the technical assistance experts' missions.

63. In the field of natural science, social science and cultural activities the on-going and accelerated U.N.E.S.C.O. programme in 1961-62 includes the provision of technical assistance and the holding of seminars and conferences on specific subjects ranging from modern library and museum techniques to modern geologic exploitation techniques.

64. These are some of the main features of the U.N.E.S.C.O. work for the development of education in Africa in 1961-62. This work will be financed from four different sources:

Regular Programme: $2,500,000;

Expanded Programme of Technical Assistance: $4,012,359;

Approved Special Fund projects: $2,782,500;

Emergency Programme: expected target of the order of $2,250,000.

65. They reflect the conviction of the General Conference, strongly expressed at its recent Eleventh Session (November-December 1960), that "the most urgent and vital need in Africa today is education".

# INTERNATIONAL CIVIL AVIATION ORGANIZATION

## Responsibility of I.C.A.O.

66. In aviation semi-skilled, skilled and professional workers are employed by airlines and other operators of aircraft and by agencies, governmental and other, which provide services for the guidance, control and maintenance of aircraft. This paper is concerned with the semi-skilled and skilled. These workers fall into three classes. First, those such as air traffic controllers, whose employment is peculiar to aviation: secondly, those such as radio and aircraft mechanics, some of whose knowledge and experience would find an application in other industries but from whom is demanded a detailed knowledge of conditions, regulations and types of equipment peculiar to aviation; thirdly, those such as general electricians and power plant mechanics whose duties are much the same as in other industries. The third class is relatively small.

67. To train the first two classes, there is a need for buildings in which space is available for practice with aviation devices, for demonstration of many kinds of typical aviation equipment and for rehearsal of procedures peculiar to aviation; for instructors who combine practical experience in their trades with ability and flair for training; and for means of ready and continuous collaboration with operating services so that teaching techniques and materials can keep pace with the development of aviation, which is still relatively rapid. This means schools or training centres or aviation sections of general technical training centres, devoted to aviation training and in close liaison with agencies engaged in aviation. The equipment which has to be provided is great in variety and amount; some of it is cumbersome; some of it must be installed with a degree of permanence. It cannot be provided for an aviation lesson in the morning and put aside to make way for a lesson in another subject in the afternoon. It also means good instructors, who need some assurance of continuity of employment and stability in their trade, and who should ideally alternate between training and duty in the field.

68. One of the functions of I.C.A.O. under its Convention is to set international standards of attainment in the distinctive aviation techniques, and to promulgate standard procedures for certification of qualified technicians and for the international recognition of their qualifications. In view of the international character of aviation, international uniformity and recognition of the quality of work done, whether it be to

ensure that an aircraft is a safe vehicle or that it will be safely navigated, is important. Hence, I.C A.O. has a duty to interest itself in the results of training. This led, not long after the foundation of I.C.A.O., to an interest in methods of training; and, for some years, I.C.A.O. has produced information and advice on methods and on the substance of instruction. For states where aviation has been pursued from the beginning and where, therefore, special aviation schools have been in existence for a corresponding time, the aim was uniformity. For other states, where direct participation in aviation by the government or by nationals of the State is relatively new, this material served not only as a guide to uniformity but also as the origin of specialised aviation training systems.

69. Almost all the effort by I.C.A.O. in training and personnel licensing has been confined to the specialised branches of aviation or to those general fields of knowledge closely associated with aviation. It has sprung from recognition of the rightness of the procedure whereby in countries suitable as models, specialised aviation training begins at ages between about 16 and 20 for students who have passed out of secondary schools, technical or academic. At this stage, and with this experience, a student can possess the general education needed to absorb instruction, the basis in mathematics and science needed for comprehension of machines and technical devices, the maturity to grasp the idea and form the habit of personal responsibility, which is a feature of particular importance in work on aircraft and in aviation services, and general practice in "using his hands". He can then, in one or other of courses varying between one and two years, or a little more, be taken to the stage at which he needs only a period of supervision while gaining experience before he engages as a "journeyman" in his trade. While this gives to aviation training a limited and fairly clear concept, it does not remove interest in other forms of education. Obviously a student taking up for the first time a specialised course of study, must have had a grounding in certain subjects and must have reached a certain level of ability. Clearly, since aviation trades are relatively new, the syllabi of aviation courses have taken account of the ability and knowledge of the average secondary school student. Equally clearly, in a country where the students are generally below the average, there are two alternatives. Either aviation training agencies must extend and broaden their syllabi, so entering into fields for which they have no special qualifications, or attempt to improve the standard of secondary school education.

Aviation Trades and Professions

70. The principal distinct occupations in aviation are as follows:

(a) pilots;
(b) aircraft engineers,
(c) aircraft mechanics;
(d) aerodrome engineers;
(e) radio engineers;
(f) radio mechanics;
(g) radio operators;
(h) aeronautical met. forecasters;
(i) aeronautical meteorological assistants/observers;
(j) air traffic controllers;
(k) electricians (general and aircraft);
(l) fire and rescue staff;
(m) flight operations officers.

There are in addition certain posts such as those in Civil Aviation administration, airport management, etc. the requirements for which are to be found among those of more than one of the trades or professions listed above.

71. The requirements for some of these aeronautical trades and professions and their duties have something in common with similar trades in other occupations - for example, in the marine, in general meteorology, in maintenance of surface vehicles. However, the amount of common ground between similar trades varies widely, and there is always in aviation training a requirement for acquaintance with aeronautical procedures, and with equipment specially designed or developed for aeronautical purposes. Safety in flight calls for, among other things, a high degree of accuracy in maintenance of a number of complicated devices and for vigorous application of uniform procedures. This means that the development of a sense of responsibility for work performed, and also the supervision of training schemes by a body fully aware of the international procedures and of trends in their development are most important.

Prerequisites

72. Before entry to courses for the occupations mentioned in para. 5 above, a student must have been prepared. There follows a number of points which must be covered, two of which should be the subject of detailed agreement between the agencies concerned.

(a) Language. The number of languages in which aviation training can be given is limited - in the case of Africa probably to two, English and French. A number of subsidiary problems arise in this connection.

(b) Mathematics and elementary physics. Agreement is needed between the agencies concerned on the general content of syllabi.

(c) Preliminary technical training - in use and care of tools, treatment of materials etc. - would be desirable for aviation as for other forms of specialised training.

(d) Sense of responsibility and the power to apply knowledge to practical problems must be inculcated, and preference for "white-collar" work removed.

I.C.A.O. in Africa

73. The funds available for technical assistance to African States in civil aviation have come, and as far as we can see will continue to come, from the Expanded Programme of Technical Assistance and the Special Fund. At present there are satisfactory programmes of assistance in training in Ethiopia, and the U.A.R., and there will shortly be in Morocco and Tunisia. Some assistance is being given in Ghana, Guinea, Liberia and the Sudan. It is clear therefore, especially as far as the newly independent states are concerned, that a considerable additional effort will be needed if a satisfactory training programme is to be launched.

74. There follows a summary of activities planned for 1961 and 1962.

GHANA: In Ghana in 1961 I.C.A.O. will conduct training for radio mechanics, air traffic controllers and teleprinter maintenance mechanics.

GUINEA: In Guinea in 1961 and 1962 a training adviser will be appointed to organise aeronautical training, assisted by a communications expert and a radio technician.

LIBERIA: In Liberia there will be an I.C.A.O. adviser in category 1, and in category 2 a civil aviation training instructor.

MOROCCO: Training will be given in teleprinter maintenance, radio mechanics, air traffic services, communication operations, aircraft mechanics meteorological observers and assistant forecasters.

SUDAN: Three fellowships will be given.

TUNISIA: Training will be given to pilots (up to commercial pilot level), aeronautical radio operators, air traffic controllers, meteorological observers and assistant forecasters.

U.A.R.: Training will be given in airport management, radio maintenance, radio navigation aids maintenance, radar maintenance and radio teletype maintenance, and to air traffic controllers and communications staff.

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## WORLD HEALTH ORGANIZATION[1]

### I. W.H.O. Responsibilities and Types of Activities in Education and Training

75. One of the functions of the World Health Organization, as defined in its Constitution, is:

> "to promote improved standards of teaching and training in the health, medical and related professions"

76. Among the other functions of W.H.O., particular reference may be made to the following two, which obviously bear on the type, quality and number of trained personnel available in the various countries: "to assist governments, upon request, in strengthening health services", and "to promote and conduct research in the field of health".

77. Although education and training have constituted an important element of W.H.O.'s programme since its inception, the Third World Health Assembly in 1950 emphasised yet further its importance by approving the following statement in the first "General Programme of Work Covering a Specific Period":

> "... extension and promotion of higher standards of professional and technical education and training of doctors, dentists, sanitarians, pharmacists, nurses, midwives, health visitors, technicians and other auxiliary health personnel, by such methods as the granting of fellowships and the promotion of extended teaching facilities, is an investment which produces benefits out of all proportion to the original outlay and ... governments should give much greater weight to this matter in their planning and budgeting ..."

This emphasis on education and training was reaffirmed in the General Programme of Work for the two subsequent periods (1957-1961 and 1962-1965).

78. Considering that local health personnel work together with the international staff assigned to the projects, most of W.H.O.'s projects of assistance have an element of training. In all these cases training may be considered as a by-product, even though a valuable one.

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[1] This paper relates to all countries and territories of the African Continent, and not only those included in the W.H.O. African region.

79. There are, however, many activities in which W.H.O. is engaged for the express purpose of promoting professional and technical education and training. They include:

(1) General surveys and studies of particular institutions, with a view to stocktaking and assisting to elaborate plans for orderly improvement or development of education and training facilities, within which indigenous efforts and assistance from outside are brought to bear.

(2) Assignment of visiting professors to specific institutions for the purpose of filling deficiencies or of establishing adequate conditions and training local personnel to take over later.

(3) Sending for a short period advisory and demonstration groups of professors in one or several scientific disciplines.

(4) Limited supply of literature and teaching equipment, in so far as this is part of a more inclusive plan of assistance.

(5) Grants to teaching and research institutions for research co-ordination or actual investigation, these institutions being also often utilised for training.

(6) Organisation by W.H.O. itself of, or assistance to teaching institutions in organising, courses for new, evolving or neglected subjects of study.

(7) Fellowships and travel grants for advanced studies and observation abroad (exceptionally also for basic professional studies whenever not available in the country of origin), and grants to permit attendance at educational meetings organised by W.H.O. for the exchange of scientific information among participants. (The importance of this aspect of W.H.O.'s activities is shown by the fact that from 1947 until the end of 1960, 11,833 fellowships were granted for the benefit of 166 countries and territories in all parts of the world.)

(8) Obtaining and making widely available collective expert opinion on matters of education and training of medical and allied personnel, by organising meetings of expert committees and study groups.

(9) Collection and publication of information on teaching institutions and on the teaching of individual subjects.

## II. Activities in Education and Training Planned by W.H.O. for Africa in 1961 and 1962

80. There is a total number of 45 projects in the programme and budget estimates for the years 1961 and 1962[1], including only the projects of a preponderantly educational character, but not those consisting solely of fellowships; seminars, symposia, and similar educational meetings on subjects other than training proper have likewise been omitted.

81. The number of projects involving only fellowships is considerable, not only for advanced studies abroad, but also for basic medical and allied education - when such is not available at home - as for the Cameroun, the Central African Republic, Chad, Dahomey, Ethiopia, Gabon, Liberia, Libya, Mali, Mauritania and Somalia.

82. Within the afore-mentioned limitations, the following are some examples of education and training projects:

(a) assistance in planning medical and post-graduate schools or assistance to existing institutions in Alexandria, Uganda, Morocco and Tunisia;

(b) organisation of a Conference on Medical Education in Africa;

(c) teaching staff and equipment for schools and practice centres utilised for combined training of two or more types of auxiliary personnel (medical assistants or equivalent, community nurses and domiciliary midwives, sanitation personnel) in: Ethiopia, Libya, the Malagasy Republic, Morocco, the Federation of Nigeria and Somalia;

(d) nursing and midwifery training in: Gambia, Mauritius, Sierra Leone, Southern Cameroons, Sudan, Tanganyika, Tunisia and the Upper Volta;

(e) training of: laboratory technicians (Sierra Leone); dental assistants (Sudan); nutritionists (inter-country project); malaria personnel (inter-country project); sanitation personnel (Sierra Leone and Zanzibar);

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[1] Off. Rec. Wld Hlth Org. 104, supplemented - as to the Expanded Programme of Technical Assistance - by documents E/TAC/L.223 and E/TAC/L.225.

(f) the emergency programme for Congo (Leopoldville) consisting of assistance to the Lovanium University for medical and nursing education (professors and some equipment), and of various special courses. This programme comprises also a long-term aspect including a large number of fellowships, mainly for the purpose of enabling medical assistants to obtain full medical qualification after some complementary studies.

83. There follows a summary of the cost of all educational activities planned for Africa, including fellowships, but excluding the emergency programme in Congo (Leopoldville)[1] and the W.H.O. inter-country and inter-regional activities which - even though not organised by the W.H.O. Regional Office for Africa - will have participants from Africa. To some extent, both the projects planned and their estimated cost are still subject to adjustments.

| SUMMARY BUDGET ESTIMATES BY SOURCE OF FUNDS[2] | 1961 US $ | 1962 US $ |
|---|---|---|
| W.H.O. Regular Budget | 634,821 | 713,277 |
| W.H.O. Malaria Eradication Special Account | 358,809 | 357,141 |
| Expanded Programme of Technical Assistance | 660,004 | 665,634 |
| Other Extra-Budgetary Funds (only amounts so far allocated by the Executive Board of UNICEF) | 36,350 | - |
| TOTAL | 1,689,984 | 1,736,052 |

[1] The cost of this programme for 1961 is of the order of magnitude of U.S.$865,000 to be reimbursed by the United Nations.

[2] Off. Rec. Wld Hlth Org. 104, supplemented - as to the Expanded Programme of Technical Assistance - by documents E/TAC/L.223 and E/TAC/L.225.

# INTERNATIONAL TELECOMMUNICATION UNION

## 1. Present Situation

84. The International Telecommunication Union is concerned with maintaining and extending international co-operation for the improvement and rational use of telecommunications of all kinds and the promotion of development of technical facilities.

85. In the case of the newly independent African countries, telecommunications have assumed a special importance in their economic development. Their present telecommunication systems were designed to meet the particular needs of previous administrations and mainly on a regional pattern. After attaining independence they have felt the need to reorganise their telecommunication networks so as to meet their requirements as independent countries. For example, they are contemplating large-scale extensions and modernisation of their telephone systems in the capital cities; their internal networks need to be extended to reach new communities, which originally had no communications and whose economic development is now in progress. In addition to the existing external links, they also require new international and overseas links with countries of common cultural and economic interest.

86. This new demand requires a large number of trained technicians and engineers. The technical personnel is required in the following categories:

1. Engineers to hold senior technical positions.

2. Higher-level supervisory technicians in charge of installations, maintenance and operations.

3. Low-level technicians.

87. At present, in most of the countries, the higher-level engineering positions are manned by expatriate officers. In a few cases there are also local engineers who have taken foreign degrees. The progressive replacement of expatriate officers by African personnel may take some years, depending to a large extent on the basic education available in the countries. However, though it would, in principle, be possible to give complete higher-technical education abroad, including basic training, it would be better for the African people to commence their studies in their own countries and then have an opportunity of obtaining a degree in a foreign university or specialised institution.

88. There are few African technicians in the posts mentioned in category 2 above and an urgent need exists for a large number of such technicians, able to ensure good maintenance of the installations and to take over responsible positions. At present the main gap is in this category of technicians. Low-level technicians may be trained, while working, under the apprenticeship system. A better training would be obtained if the apprenticeship could be reinforced by training courses, which would permit the trainees to acquire a common standard of knowledge recognised in all countries.

89. In providing technical assistance, the I.T.U. is anxious to help the countries to train staff capable of operating the various telecommunication installations, including the most modern ones. In the case of technicians, experience shows that, wherever possible, training in the country itself or on a regional basis is much more effective than sending the trainees abroad. The same considerations apply to the lower-level technicians. However, in all cases the training is conditioned by the degree of general education that is prevalent in the country.

90. The assistance given by the I.T.U. in the training field is, therefore, oriented against this background. It consists of:

1. Experts for training personnel on the spot and for installing training facilities.

2. Fellowships or scholarships for nationals of these countries to go abroad for training in telecommunication operating organisations or polytechnics, thereby improving their theoretical technical knowledge and gaining practical experience.

3. Supply of equipment for training and demonstration purposes.

91. During 1960 the I.T.U. programme for Africa provided for a total of six experts in Ethiopia, Libya, U.A.R. Egyptian Region, Sudan and the AFE Region and five fellowships to Guinea, Tunisia and U.A.R. Egyptian Region.

92. The I.T.U. 1961/1962 programme has a much greater emphasis on the aid to African countries. An amount of $808,050 is foreseen in the Expanded Programme of Technical Assistance for I.T.U. activities in these countries, which is a modest beginning, taking into consideration the extensive requirements in the telecommunications field. It should be emphasised that, during the next few years, every endeavour will have to be made to increase both the pace and the volume of this assistance.

93. In addition to this assistance under the Expanded Programme of Technical Assistance, the U.N. Special Fund has the following project under consideration

> The establishment of a Radio Communications Training School in Tripoli, Libya. Special Fund assistance: $523,600. The training will cover all levels of telecommunication personnel.

2. Future I.T.U. Activities in Africa

94. In connection with the training of telecommunication staff in African countries, plans should be drawn up on a progressive basis taking into account the presence of expatriate higher officials in the main posts of Telecommunication Administrations. The first step would be to assist in the creation of a good personnel establishment complementary to these officials for the maintenance of telecommunications. With this in mind, low-level technicians could, in the first instance, be trained in national training centres, which have still to be established in some countries. The training should be more or less standardised in order that the demonstration equipment could, if necessary, be transferred from one centre to another.

95. The second step would be the development of these centres into higher-level training institutes. The most gifted students could also be selected for further training in European countries where specialised telecommunication institutions are in existence.

96. The higher-level engineers may be promoted from the more gifted officials who have attended specialised telecommunication institutions in Africa or abroad. At a later stage higher-level engineers could be recruited from those who have had the opportunity of receiving technical education in a university up to degree level.

97. In order to attain the aims briefly described in the above paragraphs, it is visualised that, in the very near future, the following institutions would have to be established, possibly with Special Fund assistance:

(i) One training centre in the Equatorial Region of Africa to cater for the French-speaking countries.

(ii) One training centre in the Chad area for training locally lower-level technicians.

(iii) Two training centres for the French-speaking areas of West Africa.

(iv) One training centre for the English-speaking areas of West Africa.

(v) One training centre for the English-speaking areas south of the Equator, such as British East Africa, etc.

98. It must be emphasised that these are very preliminary ideas and must be studied in much greater detail before concrete action could be taken. Surveys in connection with these are in progress. Furthermore, in many countries, we can only rely on information submitted by the present telecommunication operating agencies for an estimate of the need in this field.

99. Any action should be co-ordinated with the existing bilateral aid, which in certain countries is already being applied effectively for the training of African personnel, and any duplication in this field should be avoided. As regards the financing of a training programme for the African countries, it should be remembered that existing substantial bilateral aid must be considered as well as the E.P.T.A. and Special Fund resources.

## WORLD METEOROLOGICAL ORGANIZATION

### I. Present Activities

100. In the field of education and technical and vocational training, the W.M.O. is called upon, either under its constitutional provisions or in accordance with decisions of its Congress or its Executive Committee, to deal mainly with the following matters:

(a) training of specialised scientific and technical personnel in meteorology, including its particular branches, such as aerology, climatology, weather forecasting, agrometeorology, hydrometeorology, etc.;

(b) the meteorological aspects of programmes of study or training in certain occupations or specialised fields, such as agronomists, naval officers, aircraft pilots, air traffic controllers, etc.;

(c) the elements of meteorology which may be included in the teaching of exact and natural sciences in general education programmes.

101. The categories of meteorological personnel which may receive specialised training under W.M.O. auspices comprise four main groups:

- professional meteorologists who have been trained at University or equivalent level (e.g. in first-rate technical schools). This group includes independent forecasters, agrometeorologists, hydrometeorologists, etc.;

- meteorological assistants who have had at least secondary education or equivalent technical training;

- meteorological observers, plotters, etc., who have had a good primary education;

- meteorological instruments specialists who have had primary education and complementary technical training in mechanics or electronics; this group falls into two categories: (i) technical personnel responsible for the maintenance of meteorological instruments, radiosonde apparatus, atmospheric detectors, meteorological radar, etc.; (ii) radiosonde and radar operators.

102. In addition, limited meteorological training adapted to their particular occupational field may be given to certain categories of air navigation personnel (pilots, air traffic controllers), agricultural personnel (agronomists, forestry engineers, etc.), hydrologists and geophysicists or merchant navy personnel. This list, which is far from complete, is intended to give some idea of the variety of personnel whose study or training programmes include some degree of instruction in meteorology.

103. In the past, the main forms of W.M.O. assistance in the vocational training of personnel have been the following:

(a) Training Centres. Although the W.M.O. does not at present run such centres, it participates in the operation of several regional and national training centres which have been set up either by another organisation or by the authorities of the country in which they are situated, with or without bilateral aid. In addition, training courses in theoretical and applied meteorology which are, in effect, small training centres, have been organised in various countries. For example, in the civil aviation training centre established by I.C.A.O. in Tunis, the W.M.O. arranges for meteorologists to be trained and for meteorology to be taught to personnel intending to take up work in aviation. Complementary training courses for local personnel have been organised in Leopoldville within the framework of the national meteorological service; complementary general education (mathematics, physics, etc.) is also given. A W.M.O. expert acts as Director of the training centre for meteorological technicians in Morocco and also gives training there. Hydrology courses given by a W.M.O. expert have been included in the syllabus of the Middle East Technical University established under U.N.E.S.C.O. auspices.

(b) Fellowships. Fellowships are granted to members of the staff of national meteorological services to enable them to study at a university in another country or in a school of meteorology of the type which exists in some countries, or to improve their knowledge in a meteorological service or even to receive vocational training in an industrial establishment.

(c) Seminars. The W.M.O. has already organised a number of seminars, either independently or in collaboration with other organisations. Among those of the latter type, mention may be made of the seminar on synoptic meteorology in the Mediterranean region organised jointly with U.N.E.S.C.O. in Italy, the inter-regional seminar on hydrological networks organised in Bangkok with E.C.A.F.E., the symposium on tropical meteorology in Africa and the seminar on tropical agrometeorology, held in Venezuela.

(d) Technical Publications. Manuals have been written by W.M.O. experts and used for training purposes. Special mention may be made of an elementary manual on synoptic meteorology for observers, a manual on the operation of a radiosonde station, written in English and subsequently translated into Arabic, and the translation of a Russian work on synoptic processes in Central Asia. In addition to these manuals, the guides published or in course of publication by W.M.O. may be used for meteorological training purposes. The following have already been published: a guide to international meteorological instrument and observing practice; a guide to climatological practices; a guide to synoptic meteorological practices; a guide to the qualifications and training of meteorological personnel in aeronautics. A guide to meteorological practices in agriculture is in course of preparation.

104. The W.M.O. has also published a report on existing meteorological training centres As regards films, it has collaborated in the publication under U.N.E.S.C.O. auspices of a series of slides and film-strips on clouds and hydrometeors, to be used for teaching purposes.

## II. Programmes for 1961-62

105. The W.M.O. has not so far taken steps to establish centres specialising in meteorological training in Africa. However, the possibility of establishing two regional training centres, one having French and the other English as its working language, is being considered. Moreover, the W.M.O. will continue to participate in the work of schools and training centres already in existence or in process of establishment. It will participate in the work of the existing centres in Tunis (the national civil aviation school which receives assistance from I.C.A.O.), in Casablanca (the national centre for training of meteorologists which receives bilateral aid), in Cairo (the national civil aviation school which receives assistance from I.C.A.O.) and the centres now being established in Dakar, Brazzaville and Tananarive (regional centres receiving bilateral aid).

106. In addition, W.M.O. experts will provide training in Ghana, Guinea and Nigeria in 1961-62, within the framework of the national meteorological services.

107. The funds for the above-mentioned activities will be provided under the Expanded Technical Assistance Programme. It should also be mentioned (although the country concerned is outside the African continent) that under the Special Fund project relating to the meteorological institute in Israel, the latter will probably be able to accept fellows for advanced training in meteorology in 1962.

108. The possibility of providing advanced training in meteorology in an African university having French as its working language and in another having English as its working language is also being considered.

109. Fellowships. The W.M.O. fellowships programme for 1961-62 under E.T.A.P. comprises 32 fellowships to be allotted as indicated to the following countries: Congo (Brazzaville)(4); Ivory Coast (4); Dahomey (4); Ethiopia (1); Guinea (2); Upper Volta (4); Libya (1); Mali (4); Niger (4); United Arab Republic (3); Sudan (1). In addition, it is proposed to grant a number of fellowships in meteorology to the Congo (Leopoldville) within the framework of United Nations technical assistance. If possible, a number of similar fellowships will be added to the programme; the cost of these might be met from the technical assistance contingency fund, extra-budgetary funds or W.M.O. funds.

110. Seminars. It is proposed to organise two seminars in Africa or with the participation of African countries in 1961-62. One of these would deal with weather forecasting in the upper air and would be organised jointly with I.C.A.O. The other would deal with tropical meteorology. The funds for the latter would be drawn from the regular budget. In addition, the W.M.O. has made arrangements to hold in Rome, jointly with U.N.E.S.C.O., in 1961 a symposium on climatic variations at which African countries will be represented.

## INTERNATIONAL ATOMIC ENERGY AGENCY

### I. Main Directions for Assistance by the I.A.E.A.

111. The Agency's assistance to countries of Africa which recently became independent should have many purposes:

(a) Professors and Fellowships - The object of this programme would be to promote the creation of local scientifically and technically trained personnel or specialists well acquainted with the basic principles of nuclear science and its possible application for peaceful purposes in accordance with specific circumstances of each separate nation and the whole region. Fellowships should preferably be awarded for long-term periods, i.e. four to six years, in order to train specialists with a wide knowledge in the field of theoretical and experimental physics in general, and nuclear theoretical and experimental physics in particular, as well as in the field of medical and agricultural sciences, including the application of radio-isotopes.

There is in almost all countries concerned a great need for teaching staff at university and college level. In universities and other higher educational institutions courses on atomic energy are offered at a very low level or not at all. For this reason, visiting professors should be sent for teaching at universities and scientific colleges rather than for the development of general scientific work. Their services should be utilised for lectures on subjects which are closely connected with nuclear science and its application for peaceful purposes, as well as for the improvement of the curricula for the higher educational institutions in order to reflect the latest achievements of nuclear science. The duration of the assignment of visiting professors to these regions should probably be much longer than for other countries.[1] Faculties of science in

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[1] An I.A.E.A. Preliminary Assistance Mission which visited several countries in the region reached conclusions along these lines. Thus, with respect to the Sudan, it reported that:

"At a later stage, in atomic energy development in Sudan, the Agency could be asked to provide a visiting professor to the University of Khartoum, to organise courses and teach special subjects connected with the peaceful applications of atomic energy."

universities, medical, agricultural and other colleges might be a potential base for the training of specialists in the field of atomic energy.

(b) Training of Scientific Administrators - The object of this activity would be to promote the training of local administrative and executive staff who might later be organisers of educational and scientific activities in general, and in the field of nuclear science in particular.

(c) Use of Radioisotopes - The Agency could help the newly independent countries of Africa to apply radioactive isotopes mainly in medicine and agriculture, and probably at a later stage in some branches of industry. According to the report of an I.A.E.A. Preliminary Assistance Mission which visited the countries mentioned below, there is already a need for specialists in the field of the application of isotopes in medicine and agriculture to Morocco, Sudan, Tunisia and the Republic of Mali.

(d) Equipment and Research - Under this heading the object would be to encourage the countries of Africa to create technical facilities for teaching students and training specialists in the field of atomic energy; to help procure necessary equipment for laboratories of higher educational institutions, training centres and other similar establishments in order to help in achieving the aims mentioned above.

The Agency should help the countries in scientific planning, in the enlargement of curricula of higher educational institutions, bearing in mind national conditions of each country. The I.A.E.A. should organise a mobile or transportable exhibition on the peaceful uses of atomic energy in order to raise some interest in nuclear science and its application for peaceful purposes among intellectuals and students of all ages.

II. Proposed Practical Measures[1]

(a) Fellowships - It is planned to award approximately five fellowships during 1961 and 40 fellowships each subsequent year (approximately two students from each country per year).

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[1]Until the admission into the Agency of those countries in the area which have not yet joined it, it would be necessary for them to seek the Agency's assistance through the machinery of E.P.T.A.

Over the two-year period it should be possible to award about 60 fellowships. Should the I.A.E.A. be in a position to offer long-term fellowships (four to six years) it is felt that 70-75 per cent. of these awards should be of this type.

(b) Visiting Professors - Ten visiting professors every year, on the average, or approximately 20 visiting professors during the two year period (approximately one visiting professor for two countries per year).

(c) Training Courses - Courses could be organised with the co-sponsorship of other interested specialised agencies of the United Nations or other interested bodies, such as the U.N. Economic Commission for Africa. Each course would be open to approximately 20 students and would be arranged for a period of two to three months, with one course each year.

(d) Regional Training Centre - The studies already initiated on the possibility of establishing a regional training centre for the region of tropical Africa would be followed up.

(e) Educational Seminar - Consideration should be given to organising in, say, 1963 a regional educational seminar at which professors and local specialists responsible for education in the advanced educational establishments should be invited in order to discuss the best ways of introducing nuclear science into curricula of higher educational institutions. Such a project would involve U.N.E.S.C.O. and other agencies.

(f) Seminar for Educational and Scientific Administrators - Such a seminar might be organised in 1964 and co-sponsored by other interested organisations in order to familiarise the participants with the aims, forms and modern methods of organisation of scientific and educational work, as well as the development of nuclear science and its application to peaceful purposes.

(g) Equipment - Consideration should be given to the problem of providing the equipment needed for laboratories of higher educational institutions, proposed courses and regional centres. It should be borne in mind that a minimum amount of equipment (which is often non-existent in less-developed countries) is essential for organising useful work in the peaceful uses of atomic energy.

(h) Literature - A list should be prepared of the kinds of scientific literature that should be made available to these countries, the sources it is obtainable from, and the librari s it should be sent to.

(i) Exhibitions - Consideration should be given to organising a mobile exhibition on the peaceful uses of atomic energy. At this exhibition popular lectures should be delivered on the peaceful uses of atomic energy in order to arouse interest in this subject among the local intellectual leaders and students.

(j) Mobile Laboratory - One of the Agency's mobile laboratories might be made available in connection with the proposed exhibition and courses.

## III. Financial Considerations

112. The following estimate of technical assistance in the peaceful uses of atomic energy is an extremely rough approximation based on the limited information available at present with respect to needs for these newly emerging countries.

| | | | |
|---|---|---|---|
| **Fellowships** | | | |
| 30 - under E.P.T.A. auspices | at | $ 4,000 | $ 120,000 |
| 30 - long-term, 4 to 6 years, assuming host-country offerings; | at | $ 300 (overhead) | 10,000 |
| **Visiting Professors** | | | |
| 20 | at | $ 11,000 | 220,000 |
| **Training Courses** | | | |
| 2 - including professor, fellowships, administration and equipment | at | $ 60,000 | 120,000 |
| **Seminars** | | | |
| 2 - including payment of travel for participants from African countries, Agency P-Staff and specialist, equipment, translators, etc. | at | $ 50,000 | 100,000 |
| Total Approximate Estimate for Two Years: | | | $ 570,000 |

## UNITED NATIONS CHILDREN'S FUND

**113.** Although U.N.I.C.E.F. allocations to Africa have been increasing year by year, efforts to expand aid have been limited in recent years by the fact that the many new governments are faced with staggering problems of setting up governmental machinery, developing their economic facilities and training personnel to plan and carry out programmes. The shortage of young persons with basic education makes it difficult to train staff in adequate numbers for health, nutrition and family and child welfare services. There is often sharp competition among the Government ministries for limited budgetary funds and for qualified personnel.

**114.** Direct aid to training: Of the 132 projects now aided by U.N.I.C.E.F. in 38 countries and territories on the Continent, 53 have important training and education aspects. For basic maternal and child health, nutrition and family and child welfare services, the U.N.I.C.E.F. Board has allocated about $2.7 million in the past three years. Of this about $381,000 (14 per cent.) was for direct aid for training; $158,000 for training equipment; $82,000 for vehicles for trainees and supervisors; and $141,000 for training stipends and salaries for teachers.

**115.** The provision of aid in the form of local costs of training stipends or salaries of teachers is often a key factor in starting a training project within a country or expanding an existing one. Over the years, the Board has authorised almost half a million dollars to cover training stipends and teaching grants for projects in Africa, thus:

| | U.S. dollars authorised | No. of stipends for trainees | No. of grants for teachers |
|---|---|---|---|
| Basic Health/MCH | 317,635 | 2,024 | 46 |
| Family and Child Welfare | 151,141 | 3,216 | 1 |
| Nutrition Education and Related Activities | 19,585 | 1,248 | - |
| Disease Control | 4,000 | 30 | - |
| Grand Total | 492,361 | 6,518 | 47 |

In many cases, nursing or midwifery trainees receive kits provided by U.N.I.C.E.F. on completion of a course.

116. Indirect aid to training: In addition to direct aid for training, indirect training benefits accrue from almost every project aided by U.N.I.C.E.F. Thus, in-service demonstration and training are afforded for many thousands of traditional birth attendants and other health workers through the 1,600 health units equipped by U.N.I.C.E.F. in 26 countries of Africa, while many thousands of workers learn methods and techniques of disease control and general public health education through 61 disease control campaigns now in operation on the Continent. The dissemination of health education to the public is also a significant factor in these campaigns.

117. Training survey: The Executive Board at its session in March 1960 called for a comprehensive study of the effectiveness of U.N.I.C.E.F.'s training efforts to date and a survey of possibilities for increased effectiveness in this field. W.H.O. engaged a special consultant to review training needs in the field of maternal and child health, and survey visits were made to a number of African countries and territories for this purpose in 1960. The survey will cover possibilities of further international support for the training of leaders to organise broad nutrition programmes, and for the training of public health workers, school teachers, social workers, home economists and agricultural extension workers in various aspects of nutrition. An F.A.O./W.H.O. team made a survey of nutrition training in Africa in the fall of 1960. The United Nations Bureau of Social Affairs will contribute a section on training for family and child welfare services. The report of the survey, which will be presented to the June 1961 Session of the U.N.I.C.E.F. Board, will cover technical aspects of training as well as such non-technical aspects as the amounts of financing needed; the social and educational obstacles to the recruitment of trainees and the possibilities of subsequent employment. It is the intention of the Executive Director to make recommendations on the basis of the survey report for future U.N.I.C.E.F. aid to training.

118. Forecast for 1961: In view of the great interest in training expressed by the Executive Board, some increases in such aid may be expected. For 1961, a forecast indicates that allocations totalling $4.3 millions may be requested for 51 projects involving training, thus:

| Types of projects involving direct aid for training | No. of proposed projects | Proposed aid U.S.$ |
|---|---|---|
| Basic MCH Services | 20 | 1,800,000 |
| Family and Child Welfare Services | 10 | 649,700 |
| Nutrition Education and Related Activities | 18 | 864,000 |
| Milk Conservation | 3 | 980,000 |
| Total | 51 | 4,293,700 |

Based on experience of several past years, from 10 to 40 per cent. of this aid would be directly for training.

119. Basic MCH Services: U.N.I.C.E.F. is helping 26 African countries to strengthen their basic maternal and child health services and to train workers for the expansion of these services. Of $2.8 million thus far allocated for such projects, between 30 and 40 per cent. has been for direct aid to training, chiefly for within-country training schemes, emphasising training for auxiliary staff. Increasing attention has been directed recently to upgrading the training of professional personnel (doctors, nurses, midwives, nutritionists and social workers); to providing orientation in paediatrics and preventive medicine, and to the provision of suitable training for "directing" staff capable of planning, directing and executing programmes. Increasing attention is also being given to the training of teachers and persons who can help to develop training schemes. At Makerere University in Kampala, Uganda, U.N.I.C.E.F. has helped to establish a chair in paediatrics and several projects are under consideration to strengthen paediatric training in other African countries.

120. The International Children's Centre in Paris (for which U.N.I.C.E.F. shares the costs of operation with the French Government) has also played an important role in paediatric training at the higher level. African personnel, among others, go to the Centre to attend courses and seminars in the health, nutritional, social and psychological problems of childhood. Doctors, public health officers, social workers and psychologists come from governmental posts in their own countries and return to those posts with enriched experience at the conclusion of their training. Many African personnel, trained at the Centre, have been called to responsible posts in their governments. The Centre has also arranged seminars, research projects and meetings in Africa on problems especially affecting African children. In collaboration with the Commission for Technical Co-operation in Africa South of the Sahara, a symposium on child welfare was held in Lagos, Nigeria, in March 1959. At Abidjan in April 1960 a meeting to examine child health services in relation to general public health services was attended by the majority of French-speaking Ministers of Health from the newly independent African republics and by their chief medical advisers. With the help of the Centre, a rural pilot family welfare centre has been created at Khombole in Senegal which trains personnel to run similar centres in other regions of Africa.

121. Nutrition education and related activities: U.N.I.C.E.F. is currently aiding five such projects in Africa: In Ethiopia nutrition training is provided for several hundred school teachers who will in turn instruct other teachers how to organise courses for the nutrition education of mothers and how to supervise school gardens. In Libya the project includes teacher training in nutrition, development of pilot garden projects and rural demonstration and training classes to educate women in nutrition, mothercraft and homecraft. A nation-wide project launched in Morocco in 1960 emphasises the value of fish and fish products as protein-rich foods. Training courses and nutrition education are carried out in schools and health centres. In Tunisia, nutrition education will be introduced into the curriculum of all schools. School gardening demonstrations are expected to encourage the expansion of gardening. School teachers, principals and health educators receive training in nutrition and help to develop audio-visual materials for instruction in nutrition. In the Uganda project, health education in primary schools, school gardens and demonstration fish farms are the main features, and plans are under way for the training of primary school teachers.

122. High-protein food development: U.N.I.C.E.F. and F.A.O. are working with Governments of several African countries to help develop new sources of protein-rich foods suitable for children. Trained technologists will be needed in the next phase of these projects for production of basic protein concentrates and for the formulation and manufacture of acceptable food products including these concentrates.

123. Milk Conservation: Three milk conservation projects assisted by U.N.I.C.E.F. in Africa have important training elements, thus: The Mariakani dairy scheme in Kenya includes a centre for training in advisory and extension work in milk production, milk hygiene, milk processing and quality control. In Ethiopia, U.N.I.C.E.F. is helping in an effort to institute milk quality control, to train extension service workers in better milk production techniques, and to channel safe milk to children and mothers through schools, institutions and hospitals. The U.N.I.C.E.F.-equipped dairy plant at Sakha in the Egypt Region of the United Arab Republic has been established in connection with the Government's Agricultural Experiment Station and serves as a demonstration and training base for dairy technicians.

124. Several African health and agricultural ministries were represented at the three-weeks training seminar in milk quality control, sponsored by the Finnish Government and held in

Helsinki in June 1960. U.N.I.C.E.F. paid half the costs. Dairy plant personnel from Ethiopia and Kenya will attend a four-months training course to be held in Bombay, India, in June 1961 under sponsorship of the Danish and Finnish Governments and F.A.O., U.N.I.C.E.F. paying most of the expenses of the participants.

125. Primary education - nutrition and health aspects: In the Upper Volta, U.N.I.C.E.F. is helping in a rural primary education project, emphasising agriculture, nutrition and health. A new type of practical instruction will be introduced into existing schools. For children between 12 and 17 years of age who have not attended school, new schools will be established offering three years of combined primary and fundamental education. Agricultural and other practical studies will be stressed. Seven special training centres will be set up to train rural primary school teachers. These centres will later serve as models for additional rural education centres. Five new agricultural training centres will be set up to teach farmers improved methods of tillage and soil utilisation and to advise the rural education centres.

# ANNEX II

## ARRANGEMENTS IN FORCE WITH RESPECT TO CONSULTATION AND CO-ORDINATION IN THE FIELD OF EDUCATION AND TRAINING

## UNITED NATIONS

1. Inter-agency co-operation in this field takes place both within the framework of the A.C.C., through periodic meetings of certain of its subsidiary bodies, and - to an even larger extent - by means of informal contacts or ad hoc arrangements. For instance, in the case of training activities under such concerted action programmes as community development and housing and related community facilities, working groups of the A.C.C. meet annually and report to the A.C.C. through the Meeting on Social and Related Economic Questions. For the training of personnel such as public administrators, statisticians, social service and social defence experts and town planners, however, the methods of inter-agency collaboration are more informal, while for other aspects of training, joint seminars are frequently held, or ad hoc meetings are convened as necessary, as in the training of personnel for rehabilitating the physically handicapped.

2. In a number of these training activities, the United Nations is the organisation primarily responsible for the work at hand and takes the initiative in calling upon the other agencies for co-operative action. Thus, in the case of institutes of public administration and statistical training centres, the United Nations takes the lead, but relies upon other agencies, as required, to provide instruction in the fields of their special responsibility. Conversely, where one of the other agencies is primarily concerned - as instanced by the U.N.E.S.C.O. regional fundamental education centres or the I.L.O. Andean Indian Mission - the initiative rests with the agency in question. The determination of primary responsibility for particular training activities usually follows the distribution of basic responsibilities among the various agencies for substantive work in these fields.

3. It is to be noted that, as regards expanded programme activities in the field of training, the "country programming" procedures provide opportunities for appropriate consultations between organisations during the preparation of the country requests.

## INTERNATIONAL LABOUR ORGANISATION

4. The I.L.O. has concluded two agreements on training with other organisations in the United Nations family: the agreement of 28 April 1955 with the Food and Agriculture Organization of the United Nations (F.A.O.) and the agreement of 14 October 1954 with the United Nations Educational, Scientific and Cultural Organization (U.N.E.S.C.O.).

5. In general, these agreements have been applied satisfactorily. However, certain problems have arisen as a result of the considerable increase in I.L.O., F.A.O. and U.N.E.S.C.O. activities brought about by the constantly growing number of requests submitted to these organisations by their Member States, both within the framework of technical assistance and under the Special Fund.

6. Consultations between the above-mentioned organisations on certain programmes have shown the need to go beyond procedural questions and consider the basic problems which face the organisations as a result of the constant increase in the number of countries that request their assistance. It was considered that, in the circumstances, co-operation might best be ensured by more flexible ad hoc arrangements and by joint action in cases where this seems more appropriate.

7. In February 1961, a meeting of I.L.O., F.A.O. and U.N.E.S.C.O. representatives was held in order to settle, on a tripartite basis, the problems related to the respective responsibilities of the three organisations in the field of vocational training and agricultural education. This meeting resulted in the drawing up of a memorandum of agreement which forms a supplement to the U.N.E.S.C.O./F.A.O. agreement of September-October 1960 on agricultural education.

8. Consultations on vocational training in the industrial field are proceeding between U.N.E.S.C.O. and I.L.O.

## FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

9. A considerable volume of consultations between F.A.O. and other members of the U.N. family, on the subject of education and training, has taken place over the years. These consultations have occurred at both policy and technical levels. In many instances, consultations have been followed by joint training activities. Among the many examples of such joint action are: co-operative and forest workers' training centres with I.L.O.; operation of fundamental education centres with U.N.E.S.C.O.; nutrition training centres with W.H.O. and U.N.I.C.E.F.; and community development training with the U.N.

10. Informal consultations have been supplemented, in the case of several agencies, by formal agreements. U.N.E.S.C.O. and F.A.O. have reached agreement on the mode of co-operation in agricultural education during consultations held in Rome in September and in Paris in October-November of 1960. The relative roles of I.L.O. and F.A.O. in the field of vocational training are described in a 1955 supplement to the general agreement between the two agencies which came into force on 1 September 1947.

**11. In February 1961, a meeting of I.L.O., F.A.O. and U.N.E.S.C.O. representatives was held in order to settle, on a tripartite basis, the problems related to the respective responsibilities of the three organizations in the field of vocational training and agricultural education. This meeting resulted in the drawing up of a memorandum of agreement which forms a supplement to the U.N.E.S.C.O./F.A.O. agreement of September-October 1960 on agricultural education.**

## UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

12. Apart from the general agreements which it has concluded with the United Nations and with some organisations in the United Nations family, U.N.E.S.C.O. is a party to the following arrangements relating to consultation and co-ordination with respect to questions of education and training.

### 1. I.L.O./U.N.E.S.C.O. Agreement

13. This agreement was concluded in October 1954 in order to specify the basis for collaboration between the two agencies in the field of technical and vocational education and in related fields (vocational guidance, study and training abroad). It defines the main spheres of interest of each organisation and the spheres of possible joint interest and establishes principles for collaboration, consultation and co-ordination.

14. Conversations are taking place between the two secretariats with a view to reconsidering this agreement in the light of experience.

### 2. F.A.O./U.N.E.S.C.O. Agreement

15. This agreement was concluded in October 1960 in order to specify the practical arrangements for co-operation between the two organisations in the field of agricultural education, particularly in relation to technical assistance and Special Fund projects. It lays down the practical arrangements for co-operation in the field of higher, intermediate and out-of-school education and with respect to the training of teachers for intermediate agricultural schools and the organisation of surveys and meetings.

16. In February 1961, a meeting of I.L.O., F.A.O. and U.N.E.S.C.O. representatives was held in order to settle, on a tripartite basis, the problems related to the respective responsibilities of the three organizations in the field of vocational training and agricultural education. This meeting resulted in the drawing up of a memorandum of agreement which forms a supplement to the U.N.E.S.C.O./F.A.O. agreement of September-October 1960 on agricultural education.

## INTERNATIONAL CIVIL AVIATION ORGANIZATION

17. I.C.A.O. has an agreement with the W.M.O., paragraph 4 of which reads:

> "4.1 While W.M.O. will be responsible for specifying the requirements for meteorological knowledge of meteorological personnel engaged in the provision of meteorological service for international air navigation, the definition of the requirements for non-meteorological operational knowledge that should be met by such personnel will be undertaken by I.C.A.O. and will be transmitted to W.M.O. in the form of recommendations.
>
> 4.2 W.M.O. will be consulted by I.C.A.O. in connexion with this action and will be invited to participate in any relevant discussions in the Air Navigation Commission or other representative body."

Recently it was agreed that W.M.O. should supervise the training in meteorological subjects conducted at training centres operated by I.C.A.O. in agreement with the Special Fund.

18. As far as other agencies are concerned I.C.A.O. looks to the A.C.C. to provide the opportunity and the means of co-ordination.

19. W.H.O. is privileged to have a limited and well-defined objective and well-established professions which are devoted to its pursuance. There are, nevertheless, a few areas, mostly marginal, which require inter-agency co-operation. Mutual understanding has contributed to the inter-agency agreements delimiting each agency's responsibilities as clearly and logically as possible. Thus, areas of overlapping and interaction are easily discerned and the need for co-operation is obvious even prior to the planning stage, when data are marshalled. As to the bulk of W.H.O. activities, no problem or need for detailed co-ordination arises, the matters being as disparate as medical education and education in agriculture, education in nursing and training of physicists.

20. Examples of areas requiring or providing opportunities for inter-agency co-ordination are the following: the training of nutritionists and veterinarians (with F.A.O.); the training of certain rehabilitation workers and some statisticians (with U.N.); the training of schoolteachers and of adult education workers, in so far as education in health is concerned (with U.N.E.S.C.O.); training in radiation medicine and radiation health protection (with I.A.E.A.); training in occupational health (with I.L.O.). Particular mention should be made of education in physical, chemical, biological and social sciences, because the extent to which they are included in general education influences the training in medicine and para-medical professions (a matter for co-ordination with U.N.E.S.C.O.).

21. Other important elements contributing to co-ordination include:

22. Alertness to the indications and advantages of co-operation with other agencies.

23. The existence in matters of health of one principal authority in each government (ministry of health, or equivalent) with which W.H.O. deals solely. Thus, co-ordination, as far as health matters and W.H.O. are concerned, is achieved at the governmental level, even though other government authorities may be responsible for some aspects of health. Co-ordination at the country level is found to be the most realistic and effective. This is further enhanced by the existence of one authority in W.H.O. (the respective regional office, including area and country representatives) permanently responsible for co-operating with a specified limited number of governments, which becomes well conversant with the needs and anticipates future plans.

24. The inter-secretariat arrangements for bringing to each other's attention the respective programme and budget proposals, e.g. T.A.B. machinery, exchange of documents between agencies.

25. Apart from arrangements for co-ordinating education and training at the A.C.C. level, and the above summary of satisfactory W.H.O. experience, no other suggestions commend themselves at this stage. In fact, the need for detailed co-ordination with other agencies is very limited in the case of W.H.O.

## INTERNATIONAL TELECOMMUNICATION UNION

26. Up to the present time no formal agreement has been concluded between the I.T.U. and the other organisations for consultation or co-ordination on educational or training programmes. However, in 1950 the I.T.U. Administrative Council made resolution No. 196 in respect of relations between the I.T.U. and other specialised agencies, who have a substantial interest in telecommunication matters. This resolution mainly concerns three particular organisations, namely the I.C.A.O., W.M.O. and I.M.C.O., but it shows the pattern for similar co-ordination with other specialised agencies on questions of common interest. The Administrative Council resolution reads as follows:

No. 196
(amended)

RELATIONS BETWEEN THE UNION AND OTHER SPECIALISED AGENCIES HAVING A SUBSTANTIVE INTEREST IN TELECOMMUNICATION SERVICES
(Cf. PV CA5/31 - October 1950
PV CA9/25, Doc. 1606/CA9 - May 1954)

The Administrative Council,

considering

1. Article 27 of the International Telecommunication Convention, 1952, concerning co-operation of the Union "with international organisations having related interests and activities"; Chapter 1, paragraph 4, of the General Regulations annexed to the said Convention as regards the invitation and admission of specialised agencies to plenipotentiary conferences, and Chapter 2 of the General Regulations as regards admission of specialised agencies and other international organisations to administrative conferences, and Council resolutions 111 and 113;

2. the Reports of the Secretariat of the United Nations on the co-ordination of activities of specialised agencies in the field of transport and communications (U.N. Document E/CN. 2/84 and Add. 1 and corrections 1 and 3 thereto);

3. the existence of numerous questions of common technical interest for the International Telecommunication Union on the one hand and the International Civil Aviation Organization (I.C.A.O.), the World Meteorological Organization (W.M.O.),

and the proposed Inter-governmental Maritime Consultative Organisation (I.M.C.O.) on the other, in which it is desirable that these organisations collaborate closely with each other with the support, when appropriate, of the United Nations Economic and Social Council and in its Transport and Communications Commission; and

4. that, among these questions of common interest, there are, notably, the most efficient utilisation of the radio-frequency spectrum and the establishment and exploitation of telecommunication facilities by wire or radio relay links which are of particular interest to the permanent organs of the Union;

recommends

that the following procedures be informally agreed to as a modus vivendi governing consultations among the four agencies with the broadest mutual interest in telecommunication matters, namely I.C.A.O., W.M.O., the proposed I.M.C.O., and the I.T.U.:

Each of the above organisations shall:

(a) invite the others to those of its conferences or meetings where questions of common interest will be studied;

(b) include in the agenda of its conferences or meetings questions submitted by any one of the other organisations;

(c) keep the others constantly informed of contemplated tasks and programmes believed to be of common interest and currently supplied, free of charge, with all relevant documents of mutual interest subject to such measures as are necessary to protect confidential material;

(d) take all possible steps to facilitate mutual collaboration including the formation, whenever desirable, of mixed committees comprising technicians of the organisations particularly competent in the matters under consideration;

invites

the other specialised agencies concerned to consider and approve the procedures set forth; and

directs

the Secretary-General of the Union to transmit this resolution to each of the other specialised agencies concerned with a request for their approval or comments thereon, and to the United Nations for information.

## WORLD METEOROLOGICAL ORGANIZATION

27. Arrangements have recently been made with I.C.A.O. for W.M.O. to participate in the training provided in the regional civil aviation centres to be established by I.C.A.O. The two organisations already co-operate in this way in several countries where W.M.O. experts are responsible for the meteorological aspects of the training given in centres set up under I.C.A.O. auspices. The Tunis centre is a case in point.

28. This co-ordination goes beyond the field of instruction in training centres, since arrangements have recently been made for I.C.A.O. and W.M.O. to collaborate in the organisation of seminars. For example, a seminar to be held in Cairo in 1961 will consider weather forecasting in the upper air - a subject of current interest in so far as commercial jet aviation is concerned - and W.M.O. is responsible for the technical aspects of this seminar.

29. Moreover, there have been preliminary discussions between officials of W.M.O. and U.N.E.S.C.O. with a view to determining whether - and to what extent - it would be possible to make provision for complementary specialised training in meteorology to be given in one or more general or technical education centres which might be set up by U.N.E.S.C.O. in Africa.

30. Co-operation has been established with bilateral aid programmes in Africa and appears to be developing satisfactorily. For example, W.M.O. participates in the work of the Casablanca training centre for meteorological personnel which operates partly under bilateral aid. The provision of assistance in the form of fellowships and, possibly, instructors is also being envisaged for the training centres for meteorologists to be established under bilateral aid programmes in Dakar, Brazzaville and Tananarive.

## INTERNATIONAL ATOMIC ENERGY AGENCY

31. The Agency's technical assistance programme is planned and carried out in close co-operation and co-ordination with the United Nations and the specialized agencies. The Agency has concluded relationship agreements with the U.N., F.A.O., I.C.A.O., I.L.O., U.N.E.S.C.O., W.H.O. and W.M.O. and is negotiating an agreement with I.M.C.O. These agreements include a provision to the effect that the parties will keep each other fully informed concerning all projected activities and all programmes of work which may be of interest to the other party. In practice, the relationship agreements are carried out by frequent consultations and occasional meetings between responsible officers of the Agency and other interested agencies. These consultations concern the whole field of technical assistance including experts, equipment, fellowships and visiting professors. In addition, technical assistance experts working for the Agency are briefed not only at the Agency's headquarters but also, where appropriate, at the headquarters of other interested organizations and by their field representatives, if any.

ATOMIC ENERGY

## A. RESEARCH PROJECTS BEING SUPPORTED BY THE UNITED NATIONS FAMILY

### A. Disposal and treatment of radioactive waste

**IAEA**

Research is proceeding on the following subjects under contracts awarded by the IAEA:

1. Factors controlling the distribution of fission products in the biosphere.

2. Investigation of the possibility of using wood as an inexpensive raw material for the preparation of ion exchange substances to be employed in waste treatment apparatus.

3. Studies of contamination in local marine resources.

4. Studies of uptake of radioisotopes by edible marine products.

5. The study of the uptake, accumulation and loss of radioactive material by marine bacteria.

6. Behaviour of fission products in soil.

7. The influence of radioactive wastes on biological conditions in a river.

8. An investigation of the factors which influence the movement of strontium-90 from soils to plants.

9. An experimental study of strontium-90 contained in certain marine animals following possible release of radioactive waste in sea water.

10. Studies on the biological concentration of fission products in molluscs from water with special reference to an index of radioactivity in water.

11. Study of radionuclides sorbed on marine sediments.

12. The uptake, accumulation and exchange of radioisotopes by open sea phytoplankton.

13. Physico-chemical requirements for the disposal of low-activity liquid radioactive wastes in soil.

14. The hydrodynamics of the disposal of low-activity liquid radioactive wastes in soil

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15. A study on the radiochemical analysis of strontium, cessium and plutonium in biological materials.

16. Ionic interaction near clay surfaces.

17. An investigation of ionic exchange in soils using radioisotopes and isotopic dilution experiments.

B. Health physics and radiation protection

WHO

1. WHO has initiated a study of the incidence, in different parts of the world, of congenital malformations which may also provide important basic data of use in connexion with the genetic effects of radiation.

2. During 1960 work was begun with WHO support and assistance on an international collaborative study on the effects of therapeutic radiation.

3. In connexion with its progress in radiation health, WHO made contractual arrangements with ICRU and ICRP for studies to begin in 1960 of the measurement of medically used radiation and radioisotopes.

IAEA

Research is proceeding on the following subjects under contracts awarded by IAEA:

1. Effect of radiation on plant cells and its modification with protective substances.

2. Investigation of intracellular chemical radiation protection substances, using as indicator immediate low-level X-ray reactions.

3. Determination of the enrichment factors of calcium isotopes in ion exchange resins; investigation of the various systems of electrolytic separation.

4. The investigation of a method of two-step grafting of haematopoietic and general tissues to counteract incipient radiation sterility resulting from accidental exposure to ionizing radiation.

5. Measurements of radium and radiostrontium accumulation in humans and study of its biological effects.

6. Recovery effects of highly polymerized (native) nucleic acid injected into lethally irradiated animals.

7. Radioiron study of physiological properties and role of haematopoietin (anaemic factor) in the haematopoietic regeneration of irradiated animals.

8. Radioisotope study of calcium metabolism in man.

9. Selection of sulfhydryl compounds for radiation protection using a new microbiological method.

10. A study of rickets using Ca-47.

11. Diagnostic applications of Ca-47 in metastatic bone lesions.

12. Investigation of the rate of bone remodelling in normal and fractured long bone of the dog, with special reference to vascular aspects.

13. In vitro and in vivo studies with Ca-47 and other bone seeking isotopes.

14. The use of Ca-47 in the diagnosis of skeletal lesions in man.

15. Calcium balance studies in metabolic bone diseases.

16. A study of uptake of radioactive calcium in the skeleton.

17. Studies of calcium metabolism in bone diseases using Ca-47, with particular reference to gastro-intestinal absorption.

18. Studies of bone metabolism in man with Ca-47.

19. The use of bone marrow grafting in the treatment of accidentally irradiated persons and in animal experiments.

C. Radiobiology

IAEA

Research is proceeding on the following subjects under contracts awarded by IAEA:

1. Electrophysiological responses of biological systems, in particular of nerve cells, to irradiation with small doses of X-rays and other types of ionizing radiation.

2. Determination of the reasons for the great variations in radiosensitivity of different microorganisms and the examination of the possibility of sensitizing microorganisms to ionizing radiations.

3. Genetical investigations on the effect of ionizing radiation on human cells grown in vitro.

4. Action of ionizing radiations on pathogenic human and animal viruses; effects on virulence and antigenic vaccinogen activity.

5. Study of radiosensitivity and isolation of radioresistant strains of lactic bacillus.

6. Study of the mechanism of activation and inactivation of bacterial spores with ionizing radiation.

7. Mutation rate at specific autosomal loci in different species of Drosophila.

8. A study of the primary biochemical lesions produced by ionizing radiations in mamalian tissues.

9. A quantitative evaluation of cell survival as a function of radiation dose.

10. Changes in spontaneous activities and in artificially stimulated electrophysiological responses of the nervous system of unanaesthetized animals exposed to various doses of localized radiations.

11. Mechanism of proteolysis of I-131 labelled fibrinogen.

12. Investigation of primary and intermediate products of gamma radiation on aqueous solution by absorption spectroscopy applied during irradiations.

13. An investigation of the radiosensitivity of the spermatogonia of Drosophila melangaster.

14. Study of chemically induced metabolic modifications of cells susceptible to modify the sensitivity of microorganisms to ionizing radiations.

15. Comparison between modifications induced by ionizing radiation when nucleic acids are respectively irradiated within intact or lyophilized cells, within isolated cell nuclei or in the pure state.

16. Investigation of the effects of ionizing radiation on the genetic material of bacteriophages with emphasis on the production, fractionation and purification of irradiated DNA.

17. Biological effects of variation of radioactivity of potassium in the perfused isolated heart.

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18. Mutability of polygenes and the utilization of induced genetic variability.

19. Radiobiological study of the lysogenic system of staphylococcus albus.

20. Study and comparison of necrolytic and radiolytic lesions at mitochondrial level (lysozomes) in aseptic perfused heart muscle.

21. The immediate effect of radiation on fatty acid metabolism.

22. Development of radioactive drugs, with special reference to tritiated drugs as radio-therapeutic agents.

23. Peripheral metabolism of thyroid hormone(s) via deshalogenating pathways and its role in thyroid-pituitary inter-relationships and metabolic effectiveness.

24. Influence of radiation and radiomimetic chemicals on genetic transduction in Pseudomonas aeruginosa.

25. Study of the relative radiosensitivities of moulds and their pectic enzymes.

26. Effects of radiations (large and low doses) on the metabolism of the central nervous system.

27. An attempt to correlate quantitatively the changes in permeability of mammalian muscle cells with the radiation dose.

D. Power reactor studies

IAEA

A study is being made under a research contract awarded by the IAEA on the stability of reactor systems by means of an analogue simulator.

E. Application of radioisotopes in medicine

IAEA

Research is proceeding on the following subjects under contracts awarded by the IAEA:

1. (a) Scanning of the liver following administration of radioiodine-labelled Rose Bengal in patients carrying echinococcus cysts;

(b) Studies of iron metabolism with radioiron and of red cell life span with radiochromium in patients suffering from either thalassemia or sickle cell anaemia.

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2. Radioisotopic investigation of the cause of endemic goitre in various places of the Philippines.

3. (a) Red cell life span in patients with congenital or acquired haemolytic anaemia, using radiochromium and preoperative spleen scanning;

(b) The ethiology of tropical iron deficiency anaemia, using radioiron in patients with parasitic infections and in cases losing iron through sweat or desquamation.

4. Red cell survival studies with radioisotopes in thalassemia haemoglobin-E and thalassemia haemoglobin-H disease.

5. Use of radioisotope scanning in liver pathology.

6. (a) Study of the effects of malnutrition on albumen metabolism in man;

(b) Study of metabolism of iodinated tyrosines in deficiency states.

F. Application of radioisotopes in agriculture

IAEA

Research is proceeding on the following subjects under contracts awarded by the IAEA:

1. Studies on the use of radioactive isotopes for fertilizer evaluation.

2. Application of radiation induced mutations to plant breeding.

3. Production of useful mutations in agricultural plants through radiation.

4. Mode of action of raw phosphate fertilizers and their limits of application.

5. Induction of genetic mutations by irradiation in plant species of economic importance.

6. Development of selection methods for induced small mutations in higher plants with special regard to mutations of yielding capacity.

7. Use of radiation treatment methods to study rice genetics and improve rice varieties used in Southeast Asia.

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8. A study of the ways of avoiding fertilizer phosphorus fixation and increasing the availability of the soil phosphorus in brown, red and yellow mediterranean soils.

9. The use of radioisotope-labelled compounds in studies on foliar application of fertilizers and growth-regulators on rice.

G. Hydrology

IAEA/WMO

The WMO is assisting the IAEA in a world-wide survey to determine the concentration of hydrogen and oxygen isotopes in natural water. The information contained in the survey is expected to provide essential knowledge of background radioactivity which will be needed later for detailed hydrological experiments in a particular area.

Safeguards methods

IAEA

Research is proceeding on the following subjects under contracts awarded by IAEA:

1. Non-destructive analysis of irradiated fuel elements using a flux integrating monitor.

2. Non-destructive analysis of irradiated fuel elements by gamma ray scanning.

3. Non-destructive measurement of burn-up of fuel elements using a monitoring method based on changes of physical properties of solids under irradiation.

4. Development of a method of non-destructive analysis of irradiated fuel elements for uranium-235 and plutonium content by monitoring and spectrometry.

5. Development of a method of non-destructive analysis of irradiated fuel elements for uranium-235 and plutonium content by measuring the fission rates at different neutron energies.

## Miscellaneous

### IAEA

Research is proceeding on the following subjects under contracts awarded by IAEA:

1. Lipid metabolism in the digestive tract of the sheep.

2. The ion exchange separation of uranium and thorium in non-aqueous and mixed media.

3. Investigations of the decay scheme of Tl-210(RaC").

## B. WORK OF THE UNITED NATIONS FAMILY ON HEALTH AND SAFETY CODES AND STANDARDS RELATING TO ATOMIC ENERGY

### Basic safety measures and standards

1. The Board of Governors of the IAEA in March 1960 approved the principles on which the Agency's health and safety standards could appropriately be based and proposed measures to ensure the observance of such standards in conjunction with assistance by or through the Agency.

2. The establishment of basic safety standards for application to IAEA operations and assisted operations was studied by a panel of experts which met in November 1960 and at which the United Nations, WHO, ILO and FAO were represented. Draft provisional standards were then circulated for comment to member States of the IAEA. These comments will be considered by the panel when it meets again in June 1961.

### Transport of radioactive materials

3. As part of its work on the transport of dangerous goods and pursuant to ECOSOC resolution 645 G (XXVIII), the United Nations arranged for a comparative study to be made of the systems of regulations on packing dangerous goods for transport. Radioactive substances are dealt with in the report under Class 7.

4. The work of the two panels, in which certain specialized agencies participated, set up by the IAEA in response to Council resolution 724 C (XXVIII) to formulate regulations for the safe transport of radioactive materials, was completed in 1960. The draft regulations were approved by the Board of Governors and welcomed by the General Conference in September 1960.

5. The IAEA has accordingly proposed to the United Nations that the regulations be included as recommendations of the United Nations Committee of Experts for further work on the transport of dangerous goods. The IAEA has recommended to Member States that they should be taken as a basis in elaborating relevant national regulations and applied to international transport. It is intended that the regulations should be revised periodically and the first revision is scheduled to take place in 1962.

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6. Several regional inter-governmental organizations, including the Central Commission for the Navigation of the Rhine, the Central Office for International Railway Transport and the European Nuclear Energy Agency (ENEA) of the OEEC, are considering the adoption of these regulations for use in their own operations or for incorporation into the rules elaborated by them for particular forms of transport.

Protection of workers against ionizing radiations

7. In 1949 ILO published the Model Code of Safety Regulations for Industrial Establishment for the guidance of Governments and Industry, adopted in 1948 by an ILO tripartite technical conference. This contains in chapter XI, section 2, a number of clauses dealing with ionizing radiations which were revised by a group of experts in November/December 1957. The new text has also been published separetely as Part II of the Manual of Industrial Radiation Protection.

8. The General Conference of ILO adopted at its forty-fourth session in June 1960 a Convention concerning the protection of workers against ionizing radiations, and a series of recommendations concerning the protection of workers against such hazards. WHO and IAEA participated in the preparation of the Convention.

9. This Convention will form Part I of a Manual of Industrial Radiation Protection, Part II of which consists of a Model Code of Safety Regulations (ionizing radiation). Other parts of the Manual will contain the following: Part III, a factual illustrated guide giving the fundamental "do's" and "don'ts" of radiation protection with particular reference to industry; Part IV, which will deal specifically with radiation protection in industrial gamma and X-ray radiography and fluoroscopy; Part V will deal with radiological protection of workers using luminising compounds.

Control and treatment of radioactive waste

10. The work of a panel of technical experts convened by IAEA on radioactive waste disposal into the sea (which had been undertaken as a result of a request made to the IAEA by the United Nations Conference on the Law of the Sea in 1958) was completed in 1959 and the report of the panel was distributed to Member States in April 1960.

11. In January 1961 a panel of experts convened by IAEA held its first series of meetings to consider the legal implications of disposal of radioactive waste into the sea, and such organizational, administrative and legal measures which might be taken at international level to implement the recommendations of the 1960 panel of technical experts. Observers from FAO, IMCO, UNESCO and ENEA, participated in the panel's deliberations. Other meetings of this panel, as well as further scientific work in this field, are envisaged.

12. Another IAEA panel will meet in April 1961 to study the sampling and monitoring methods of waste disposal into the sea. It will also consider the necessary standardization of sampling and analysis of radio-nuclides in sea water and marine products.

13. A panel of scientific experts was convened by IAEA in November 1960 to consider technical problems relating to the disposal of radioactive wastes into fresh water. It is anticipated that a study of the organizational administrative and legal aspects of the problem will be carried out under the auspices of the Agency. A Conference on Water Pollution Problems in Europe, jointly sponsored by ECE, WHO, FAO and IAEA, was held in Geneva in February/March 1961. The Conference discussed the most urgent water pollution problems in their legal, administrative, technical and health aspects, and considered the possibility of international action in this field.

14. The work of another IAEA panel on low level radioactive waste disposal is referred to under "Manuals of Safe Practice" below.

Safety of nuclear propelled ships

15. Pursuant to a resolution of the 41st (Maritime) session of the International Labour Conference held in 1958, the International Labour Office undertook a study of problems concerning the protection of crews in nuclear powered ships, in collaboration with other international organizations concerned. A report on the subject will be submitted to the 19th session of the Joint Maritime Commission in September 1961.

16. The International Conference on the Safety of Life at Sea, which was convened by IMCO in May 1960 to revise the Convention on Safety of Life at Sea of 1948, gave consideration, with the active participation of IAEA, to problems arising from the use of nuclear ships. The 1960 Convention contains a new chapter on nuclear ships, which covers general principles regarding safety assessment, the maintenance or operating manuals, and nuclear ship safety certificates.

Civil Liability

17. Although civil liability does not come strictly under the heading of health and safety, the ACC noted that a draft International Convention on Minimum International Standards regarding Civil Liability for Nuclear Damage had been prepared by a panel of legal experts convened by the IAEA in 1959. The draft Convention, together with the panel's comments on each article, was circulated to the Member States of IAEA in April 1960, with a request for comments on the draft and suggestions on further procedure. The draft, together with the comments of Governments thereon, will be the basis for elaboration of a revised draft Convention by a Committee of Government representatives which will meet in early May 1961 in Vienna. IAEA maintains close contact on this subject with ENEA with a view to harmonizing the IAEA proposals with the ENEA draft convention on third party liability and insurance of operators of nuclear installations, which was approved by the ENEA Council in July 1960.

18. The IAEA acted as co-sponsor with the Belgian Government of the Diplomatic Conference on Maritime Law (Brussels, April 1961) in so far as it concerned the liability of operators of nuclear ships. A panel of legal experts called by the IAEA in March and August 1960 to consider this problem and the panel's recommendations, which were published in November 1960, served as a working document of the Conference. The IAEA also elaborated for submission to the Conference a draft convention on this subject based on the panel's recommendations.

Manuals of safe practice

19. As a result of the work of a panel of experts, the IAEA, in consultation with ILO and WHO, published in 1958 the first of a series of safety manuals on the safe

handling of radioisotopes. Two supplements to this manual were issued in 1960 covering the health physics and medical aspects of the safety practices to be followed.

20. To meet an urgent need for guidance on safety practices, a manual on the safe operation of critical assemblies and research reactors has been prepared by the IAEA with the assistance of a panel of experts and in consultation with other interested organizations. The manual will be published in 1962.

21. A panel of experts convened by the IAEA is preparing a manual on safe disposal of low level waste from laboratories. It is expected that this work will continue into 1962.

22. IAEA plans to produce in 1961 four other manuals dealing respectively with (i) the use of film badges for personnel monitoring; (ii) laboratory monitoring techniques; (iii) safety features in the design of radioisotope laboratories; and, (iv) environmental monitoring. The IAEA is also producing instructional guides. One is in the form of a training film illustrating handling of radioisotopes, another deals with standard curricula for health physics and isotope courses, and a third with the use of small radioactive sources in educational establishments.

ANNEX IV

OCEANOGRAPHY

A. MEETINGS OF INTER-GOVERNMENTAL OCEANOGRAPHY
(first session)

(a) Possibilities for joint action on a concerted approach

1. Consideration was given to the three examples of areas of common interest identified in the report of the inter-agency meeting of specialists, namely, pollution, oceanic food resources and efficiency of navigation. It was agreed that these broad problems served to illustrate the extent of interest which several agencies have in certain subjects, and others were suggested, as for example, intercalibration of instruments and methods, design and operation of research vessels, training of oceanographers and documentation questions. As regards actual co-ordination of present activities, however, it was felt that at this stage such co-ordination depended on the identification and study of details of particular projects and operations.

2. It was noted that the IOC had not yet held its first meeting, and that the UNESCO Office of Oceanography had only begun to function. Possible joint action would therefore need to be discussed again at a later date, the agencies continuing meanwhile to exchange information about their activities and consider possibilities for joint work on an ad-hoc basis. Some examples and suggestions are given below.

3. The facilities that will become available to IAEA at Monaco might be used to conduct joint training courses in techniques of handling radio-isotopes and their use for the study of ecological processes in the sea.. FAO, in particular, welcomed this suggestion, since it would simplify the problem of arranging for the training of fisheries biologists in these techniques within the normal fellowship programme. IAEA has planned to set up an expert group to advise on the programme of work for the Monaco project and to invite the other agencies to co-operate with this group.

4. There was an exchange of views on the possibility of training courses in the marine sciences and of expert missions jointly arranged or sponsored by FAO and UNESCO. It was agreed that this was a form of co-ordination which could be usefully explored.

5. FAO and UNESCO expressed keen interest in the marine section of the world climatic atlas project of WMO, and agreed to examine ways in which support could be given to this work. It was noted that WMO has now published part of a guide to climatological practices, and that the section on marine climatology to appear shortly would be helpful to other agencies, and especially to FAO in the preparation of methodological manuals.

6. Apart from its work in preparing a manual of field laboratory methods for fisheries research (including oceanography), in which FAO hopes to have the assistance of other agencies, arrangements have been made for co-operation between FAO and WMO in making regional synopses of oceanographic information. WMO has proposed to provide a consultant to advise FAO on the outline for, and the preparation of, the texts of the meteorological chapters of these synopses. Participation of UNESCO in this project will be considered. FAO and IAEA intend to collaborate in revising the oceanographic synopsis for the Mediterranean Sea, a first draft of which has been prepared by FAO and which would be useful for IAEA's Monaco project.

7. As regards the preparation by FAO of the "Current Bibliography for Aquatic Sciences and Fisheries", a stage has been reached where it will be necessary either to limit the material covered or to obtain assistance from other sources, because of the general increase in literature on marine sciences and research in this field in relation to the staff available for the work involved. FAO has suggested that the compilation and publication of this periodical might be a joint enterprise of FAO, UNESCO and perhaps other agencies, thereby making it possible to expand its scope so as to cover all aspects of oceanography. UNESCO will consult SCOR on this matter, in view of the alternate possibility that a satisfactory bibliography of physical oceanography might be compiled by other organizations.

8. FAO is undertaking other documentation in the field of the marine sciences similar in nature to that with which UNESCO is concerned, as for example, through support of such bodies as the ICSU Abstracting Board (with which FAO collaborates directly in the field of biological abstracting). FAO is working with other bodies towards establishing a centre for the exchange of authors' reprints of scientific papers in the field of the aquatic sciences; it is assisting the libraries of new research institutions to procure both old and current literature, and is providing photocopying services and forming a comprehensive collection of published material pertaining to the marine sciences. Any of these services might eventually be supported jointly, the present services being available for use by the other agencies.

9. It was noted that FAO plans to issue information on current activities in the aquatic sciences and in fisheries as a supplement to the "Current Bibliography". It was felt that there would eventually be a need for some kind of "Newsletter" for the marine sciences, to be published promptly and

be given a wider distribution than the bibliography is likely to achieve. Material for such a "Newsletter" would have to be supplied direct by governments, institutions and individual scientists, and through scrutinizing of periodicals (as is done for bibliographic purposes). It seemed likely that in future the compilation and publication of this material had best be made jointly by the agencies concerned.

10. It was noted that the regional offices of FAO and UNESCO were engaged in activities relating to the marine sciences, and that there might be room for co-ordination at the regional level. For example, "Newsletters" are at present published by both UNESCO and FAO in the Indo-Pacific region. While the contents of each have much in common, their distribution is substantially different.

11. It was considered that there was a need for arrangements whereby the agencies would keep each other informed at an early stage of their prospective activities and of those of the other international organizations concerned. Thus at present the agencies exchange lists of the meetings, seminars etc. which they are sponsoring, but this information may be received by another agency too late for conflicting plans to be modified. In addition, these lists do not refer to important activities of organizations outside the United Nations family. FAO keeps an index of all proposed meetings in this field, and advance consultation of this index might help to avoid conflicting dates. Advance notification of the details of proposed meetings and of similar activities might also facilitate agreement on joint sponsorship in certain cases.

12. In connexion with field projects, under the Technical Assistance programmes and the Special Fund, co-ordination would be facilitated by an exchange of information at an early stage of planning.

13. It was recognized that co-ordination of activities relating to approved programmes was desirable and useful, but that it was essential to ensure co-ordination at an earlier stage. Where an agency prepares its programme of work for three or more years ahead, co-ordination of particular projects with those of other agencies may be delayed and prove impracticable. The procedure whereby UNESCO invites suggestions from other agencies regarding its next biennial programme and then submits the draft programme to them for comment (These comments being communicated to the UNESCO Conference) seemed to offer at least a partial solution to this problem. It was suggested that the agencies might consult with each other informally by correspondence when drafting their programmes of work and, where possible, exchange and discuss these drafts before submitting them to their governing bodies, for approval. Discussions on the drafts might also appropriately take place at meetings of the Sub-Committee on Oceanography. Since the different agencies have different budgetary periods and programme dead-lines, there did not seem to be any one particular period of the year best suited to such meetings, although in general December or January commended themselves as the most suitable period, ad-hoc meetings of the Sub-Committee or of certain of its members being held at such other times as would appear desirable.

(b) Collection and dissemination of information

14. Bibliographic material, information about meetings and research activities, and preparation of synopses of data have been considered under Section (a) above. With regard to registers of scientists, FAO is preparing to reorganize its existing system and suggested that agreement should be reached with the other agencies, and in particular with UNESCO, concerning the use of common and exchangeable forms, questionnaires, punchcards, etc.

15. Having recently published directories of research institutions in the Indo-Pacific area and Europe, FAO is now compiling similar information for Africa and Latin America. Material previously compiled by UNESCO according to the same format has been supplied to an international committee of scientists who will publish a world directory of marine and freshwater laboratories. FAO is co-operating in this project, but the world directory will not include information on laboratories concerned only with physico-chemical oceanography. The future activities of UNESCO in this field will be related to the advice given by SCOR and the programme of the IOC. FAO will meanwhile continue to maintain a list of organizations and institutions concerned with all aspects of research in the marine sciences, and is preparing to compile information on existing research facilities, with special reference to certain particular subjects, such as the study of fish behaviour. In its survey of research vessels, FAO proposes to use questionnaires which can be compiled and reproduced for distribution directly by photo-offset and is examining possibilities of using this technique for other basic information, such as the register of scientists. Further joint work will depend upon the needs of UNESCO for such basic information, which may become apparent at a later date.

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16. It was recognized that co-ordination would be facilitated by mutual discussion of draft programmes at the planning stage On the other hand, unforeseen joint activities would inevitably continue to arise because of the differences in budgetary periods among various agencies and the time interval between initial planning of programmes and their final approval and implementation. Some flexibility in the agencies' programmes is therefore required to permit such opportunities for joint action to be taken as necessary.

(c) Co-ordination of the work of Sub-Committee with that of the International Oceanographic Commission

17. The statutes of the International Oceanographic Commission (IOC) provide for representation of the agencies at its meetings, without the right to vote; for the transmission of copies of its reports by the Director-General of UNESCO to the secretariats of the other agencies concerned; and for the possibility of staff members of the other agencies participating in the secretariat of the Commission.

18. Stress was laid on the importance of making arrangements whereby the reports of the IOC could be made available to, and be considered by, the Sub-Committee on Oceanography for comment and, as the case might be, for the formulation of proposals for joint action. It was felt to be equally important for the IOC to be informed, both separately and jointly, of the programmes and activities of all the agencies concerned; and that this could most appropriately be done by having the reports of the Sub-Committee made available to the IOC through its secretariat.

19. It was considered essential that this mutual exchange of information be made regularly and promptly, in order to ensure effective co-ordination of current activities. Co-ordination of secretariat activities by the Sub-Committee, it was felt, might help to achieve the purpose of provision in the

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statutes of IOC whereby members of other agencies may participate in the secretariat of the Commission.

20. It was recognized that only when the IOC had met and formulated a programme would it be possible to see clearly the co-ordination of activities which would be called for. In any case no action should be taken which would tend to prejudice the co-ordinating functions of the ACC and of ECOSOC with regard to secretariats and governments, respectively.

## B. PRINCIPAL AREAS OF ACTIVITY OF INTERESTED UNITED NATIONS ORGANIZATIONS

### I. UNITED NATIONS

21. In cartography the primary concern of the United Nations lies in the carrying out of topographical, geological and geophysical surveys of the ocean floor. Basic cartographic data derived from such surveys could initiate the preparation and production of accurate maps of the sea bottom, which are essential to those branches of oceanographic research especially concerned with the exploration and exploitation of natural resources of the sea.

22. As regards the legal aspects of the matter, the Convention on the High Seas and two resolutions of the First Conference on the Law of the Sea deal with this question to some extent. The Convention establishes duties regarding measures to prevent pollution of the seas by the discharge of oil from ships and pipelines (Article 24) and in connexion with the dumping of radioactive wastes (Article 25). The two resolutions refer the question of nuclear tests to the General Assembly and the question of pollution to the IAEA in co-operation with interested groups.

## II. FOOD AND AGRICULTURE ORGANIZATION

### A. FAO's general approach to, and interest in, oceanography

23. An important part of the work of FAO is concerned with the world's living aquatic resources including, of course, those of the seas and oceans. The Organization has developed a programme to assist Member Governments in the conduct of research on these resources, to determine their location, behaviour and magnitude and to devise schemes for effective use of them, including the possibility of protecting, improving and increasing them.

24. This programme is executed by FAO Fisheries Division (mainly by its Biology Branch) within the Technical Department. It is based on fundamental considerations of the characteristics of the resources and of their environments, and consequently considerable attention has been given to oceanographic research.

25. The word "oceanography" has come in practice to have an all-embracing meaning, including every branch of art or science pertaining to the physical, chemical, geological and biological descriptions of the oceans. The inherent difficulties of separating various parts of this discipline are illustrated by the fact that oceanographers are employed and oceanographic programmes are conducted by fisheries research organizations, meteorological organizations, specialized oceanographic institutions and many other national bodies. Indeed, a large proportion of all oceanographic research is carried out by national fisheries departments (and even more is financed by them and by Naval Departments), and basically for fisheries purposes.

26. Further, regional inter-governmental fisheries organizations are at present the main agencies for planning and evaluating specific international oceanographic programmes of limited geographic scope. Fisheries institutions are among the most important producers and users of oceanographic data.

27. These facts are naturally reflected in the close working relations maintained between FAO staff and regional bodies, institutions and research workers.

28. FAO has been acting on the following assumption for a guide in developing programmes - that it is concerned with promoting and servicing the application of fundamental scientific knowledge to fisheries oceanography. This includes description of the ecology of marine organisms and their responses to environmental changes, to the end that man may make best use of them. In addition, FAO believes it has the duty of improving education with respect to the application of scientific knowledge for these purposes; and where necessary to provide a forum for oceanographers who are working on fisheries problems to meet and develop co-ordinated and co-operative programmes.

29. This definition, while serving roughly to identify a general field of interest, and also the primary purpose of particular programmes or expeditions, cannot easily be applied to distinguish either a particular field operation or the services provided by one or other specialized agency. Thus in most kinds of oceanographic work, similar observations are made with similar instruments. The kinds of observations made, and instruments used, in either oceanographic studies for fisheries purposes or for non-fisheries purposes, but not for both, are relatively few. Similarly, services such as FAO's bibliographic and intelligence service, described below, instrument intercalibration, registers

of scientists, institutions, programmes, data compilation and analysis, cut right across all aspects of oceanography, the various services, some of which are already established, set up for the assistance, for example, of oceanographers in fisheries institutions are of use to other groups of oceanographers.

B. FAO's main functions in the field of oceanography

30. The general functions are indicated by the statement of general approach and interest above. Specifically they are:

(a) The collection, compilation and dissemination of research results and other information with a view to (i) promoting their application to fisheries problems, and (ii) improving the research programmes;

(b) The conduct of meetings to discuss research results and programmes and to come to agreement on standardization of techniques, interpretation of results, conduct of future studies;

(c) Facilitation of co-operation in the field by Member Governments by formation of regional fisheries councils and commissions where necessary, and collaboration with international fisheries organizations outside the United Nations family with a view to co-ordination of their work; and

(d) Promotion and conduct of research on living marine resources and their environment through the Expanded Technical Assistance Programme and Special Fund Programme.

C. Existing projects in work programme and prospects

31. The key project, which is the responsibility of the Research Programmes Section of FAO's Fisheries Biology Branch, is the establishment, conduct and development of an intelligence service. This is based on a comprehensive system of documentation, and supplemented by a series of registers of experts,

institutions, and research programmes. These systems and services comprise the following:

(a) Concerning scientific literature:

(i) Current Bibliography for aquatic Sciences and Fisheries: An annotated list of literature, comprising 14,000 entries per year with current and cumulative indexes, is now being published regularly. Contracts have been placed for detailed indexes of entries in physical and chemical oceanography to be prepared by outside specialists and institutions. FAO is collaborating with the Aquatic Sciences Information Retrieval Centre recently established at the University of Rhode Island, where the contents of the Current Bibliography are being put on punchcards, and experiments are being made with provision of a general information retrieval service in this field. Arrangements are being made for the entries in the Current Bibliography to be arranged in subject order as from 1962; references on oceanography being grouped in one section, and it being proposed to issue notes on meetings, current activities and projects as a separate supplement. FAO is discussing with Duquesne University, Pittsburgh, a proposal for a Reprint Exchange Centre for the Aquatic Sciences and other means of improving the availability of literature on this subject. Funds are now being sought to establish the Centre.

(ii) Retrospective and special bibliographies: A contribution has been made to bibliography and data summary in connexion with the international Indian Ocean project.

(iii) World List of Periodicals for Aquatic Sciences and Fisheries: A second edition is now in the press, consisting of 5,000 periodical titles, giving their recognized short forms, frequency of publication, relative importance with regard to oceanography, languages, and coverage by abstracting periodicals. The list will be kept up to date in collaboration with the German Hydrographic Institute, Hamburg.

(b) Concerning research facilities and programmes:

(i) Register of scientists and experts: This consists now of about 2,000 names. A new series of publications from this register has been established, each of which gives an indexed list of experts in particular fields (e.g. biology of tunas; research on algae).

(ii) Inventory of institutions and organizations and of their activities: Selected summaries will be issued from time to time, beginning with an annotated list of international organizations concerned with marine and fresh water sciences. It is planned to begin in 1962 a systematic survey of the facilities and activities of research institutions. A preparatory survey has been made of research on means of improving and increasing marine resources.

(iii) Notes on meetings and current activities (published in Current Bibliography).

(c) Concerning data extraction, compilation and reductions manuals and handbooks

(i) Countries and Regional Thesaurus - a system for accumulating and retrieving and summarizing data concerning resources of countries and regions, from which synoptic statements are prepared and published.

(ii) Species and Stocks Thesaurus - a similar system for data on economic species: The preparation of synopses of data on the biology of marine species is now a co-operative effort by FAO and several national bodies, and will lend to the establishment of several co-ordinated series of publications. To this end FAO maintains a register of work being undertaken elsewhere. FAO staff and consultants will be concentrating in 1961/62 on the preparation of synopses for species of tunas, in preparation for the World Meeting on the Biology of Tunas, which will be convened in 1962 and at which will be considered the relation of tuna stocks to their ocean environment.

(iii) Oceanic Thesaurus - a similar system for physical, chemical and biological data on marine water masses pertinent to their living resources: A synopsis of information on the oceanography of the North Sea has been drafted as an experiment in application of a proposed standard format for such synopses. The International Council for the Exploration of the Sea is collaborating in this project, and the Climatology Commission of WMO has agreed to assist in preparing the sections dealing with meteorology. Synopses in this series, pertaining to the North Atlantic and adjacent seas will be published in the

new "Serial Atlas for the North Atlantic Environment", on the editorial panel of which FAO and the ICES are represented. In 1962/63 it is proposed to pay special attention to the data for the South Atlantic, in which area two new regional inter-governmental fisheries bodies may be established. Meanwhile FAO and IAEA intend to collaborate in revising an existing synopsis for the Mediterranean Sea.

(d) Concerning the theory and methods of fisheries science:

(i) Classification and terminology - preparation of glossaries and of a classification for aquatic sciences and fisheries: an index of terms (including oceanographic terms), their definitions, and language equivalents has been established. This is at present used as reference material for the preparation of manuals (see below), the Current Bibliography and research status reports;

(ii) Methods and subject Thesaurus - a system for the accumulation of information on the methods of fisheries research and on the main divisions of its subject matter, with a view to promoting improvement, standardization and intercalibration of methods and instruments.

(iii) Manuals in fisheries sciences: A Manual on Field Methods, including oceanography, was published in 1960; there has been a very large demand for the provisional edition, and it is planned to issue a revised edition, including also a guide to laboratory methods, in 1961/62. Manuals on laboratory methods are in draft, and others are planned.

(iv) Subject reviews (e.g. methods of plankton and benthos research, fisheries hydrography). The Indo-Pacific Fisheries Council has completed the first stage of a comparison of plankton sampling methods used by member countries in that region for fisheries oceanographic research. It is planned to prepare and publish in 1962/63 a review and guide to fisheries hydrography. FAO is now participating in the expert panels set up by IAEA on the legal implications of radioactive waste disposal into the sea, and on the monitoring of radioactivity in the sea.

32. These systems enable the Organization to continue to be aware of research activities in fisheries oceanography throughout the world, and of the results coming from these activities and in a variety of ways to communicate these facts to Member Governments and individual scientists and institutions. As a result of such awareness FAO has been able to suggest the areas of research to which further special aid should be brought. (The term "area of research" here refers not only to geographic areas, but to particular subjects, natural processes and organisms.)

33. In particular these systems are drawn upon for the management of EPTA and Special Fund projects in this field for which FAO is made responsible; the systems naturally serve as repository for information resulting from such projects. These projects include conduct of training centres,

provision of experts, facilities and fellowships. Finally, these systems are expected to be necessary for the Organization's discharge of any responsibilities given it in connexion with the Law of the High Seas.

34. FAO's work in this field is carried out by an elaborate complex of collaboration with national institutions, international non-governmental organizations and inter-governmental organizations, especially the Regional Fishery Councils and Commissions. The Organization established, and services two regional fishery councils (the General Fisheries Council for the Mediterranean and the Indo-Pacific Fisheries Council) and works through these bodies in promoting fisheries research in these regions. Steps are being taken to establish Commissions in Africa and in Latin America. It is proposed to convene a meeting of representatives of the secretariats of these organizations to discuss further co-ordination of techniques and similar questions. In addition FAO works closely with other (non-FAO) Commissions and Councils, notably the International Commission for the Northwest Atlantic Fisheries and the International Council for the Exploration of the Sea.

35. Field activities in marine sciences, under the EPTA and Special Fund programmes are increasing. Special Fund projects involving training or research in marine sciences are operating in Peru and Ecuador and are under consideration in Argentina, Chile, Ghana, Nigeria, India and Central America. EPTA projects are programmed for 1961 and 1962 in Argentina, Brazil, Columbia, French Antilles, Ghana, Guatemala, Honduras, Indonesia,

Korea, Madagascar, Mauritania, New Caledonia, Pakistan, Philippines, Turkey, Israel, Uruguay, Venezuela and Yugoslavia.

36. Mention should be made of an interest of the Technology and Biology Branches of FAO Fisheries Division in the design, construction and operation of research vessels. Advice is given to Member Governments proposing to operate new vessels and symposia on the subject are planned for the near future.

37. A technical meeting on the design and operation of research vessels will be convened in Tokyo in September 1961. In preparation for this a survey is being made of existing research vessels of all kinds, their characteristics, facilities, equipment, the kinds of work being performed, and the costs of running them.

38. The Biology Branch is collaborating with a group of other national and international bodies in the preparations sponsored by the American Geographical Society to issue a Serial Atlas of the North Atlantic Environment. Synopses of oceanographic data for this area, prepared by the Branch, will be published in this atlas. In connexion with the launching of the atlas, FAO and the other sponsors will hold a meeting of consultants in 1961 to consider international co-ordination of work on marine biogeography.

39. Preparatory work is now being undertaken for projects concerning the promotion of studies and exchanges of information on the improvement of marine resources. Studies have also been undertaken on the fundamental problems of predicting sea surface conditions leading towards the eventual provision of such predictions for fisheries purposes.

D. Points of contact with other United Nations agencies carrying out work in this field

UNESCO

40. FAO's representative has taken part in the meetings of UNESCO's International Advisory Committee on Marine Sciences. Statutes of this Committee were drafted in consultation with FAO, and FAO has provided lists of scientists potential members of the Committee. FAO has prepared material for this Committee and submitted proposals to it for UNESCO action, e.g. proposals for UNESCO contribution to bibliographic work by assistance to Bibliographia Oceanographica, training of oceanographers, etc. Valuable direct contact also between the FAO Fisheries Council (e.g. IPFC) and UNESCO. Thus UNESCO has supplied plankton sampling nets for comparative trials and calibration by IPFC members.

41. There has been close contact also at the regional level between regional FAO and UNESCO officers. Among the results of this have been joint sponsorship of symposia and participation by FAO staff as instructors at UNESCO-sponsored training courses. A UNESCO documentation expert (Dr. Holmstrom - now retired) assisted FAO in the development of the Biology Branch documentation handling system, and in meetings of consultants called by the Branch on aspects of the fisheries intelligence services.

42. FAO has direct contact with International Scientific Unions financed by UNESCO. This contact has been with individual associations such as IAPO, but more recently with SCOR of ICSU. A FAO representative attends SCOR meetings and is acting on SCOR working parties for the Indian Ocean Survey. FAO has produced documentation for this survey, and for other aspects of the work of the unions.

IAEA

43. FAO staff member was panel member of Panel of Experts of Radioactive Pollution of the Sea, and the Biology Branch prepared technical material for

the report of that Panel on disposal of radioactive wastes. The Biology Branch and the FAO Atomic Energy Branch collaborate with IAEA in its work on the use of radioisotopes in research, which includes their use in oceanographic and fisheries studies.

WMO

44. FAO staff member participates in meetings and work of the WMO Commission on Maritime Meteorology, especially in that of the Committee on Relations with International Fisheries Organizations. (FAO is active in encouraging action by regional fisheries councils on the proposals of the Committee.)

IMCO

45. Little direct collaboration so far but contact through participation of Fisheries Division in IMCO work on pollution of the sea by oil.

United Nations

46. FAO has points of contact with the United Nations in the field of oceanography by virtue of common interest in the Law of the High Seas. FAO has prepared working papers for United Nations Conferences on the subject, in relation to the biological characteristics of fisheries resources and their environments. In anticipation of functions devolving from the Conventions on the Law of the Sea, FAO has expanded its intelligence service to cover legal aspects of fisheries activities and the conduct of oceanographic research.

III. UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

47. The activities of UNESCO in the field of marine sciences stem from the action taken by the UNESCO General Conference in 1954, authorizing the Director-General to stimulate and co-ordinate research activities in oceanographic and marine biology. The Agency's responsibility for the

promotion of basic sciences and international scientific co-operation has been discharged through the organization of regional and national training courses; granting of fellowships in general marine sciences or in specific fields; provision of experts to help in organizing and developing research and training institutions; provision of equipment for specific projects (e.g. standard plankton nets to be distributed to member countries of the Indo-Pacific Fisheries Council); organization of symposia; sponsorship of and assistance to scientific meetings and publications; and provision of assistance to international and non-governmental scientific institutions in research programmes.

48. At its eleventh session, the General Conference, taking note of the conclusions of the Inter-Governmental Conference on Oceanographic Research convened by UNESCO in July 1960, and "recognizing that the character of the scientific investigation to be undertaken with a view to acquiring a better knowledge of the nature of the oceans and their resources calls for a concentration of effort and the co-ordination of the activities of the States and the international organizations concerned", established an Intergovernmental Oceanographic Commission, in order "to promote scientific investigation with a view to learning more about the nature and resources of the oceans, through the concerted action of its members".

49. The UNESCO programme in marine sciences for 1961-1962 has been developed in accordance with the resolutions and programme decisions of the General Conference at its eleventh session. In order to implement these decisions, an Office of Oceanography has been established within the Department of Natural Sciences. The programme administered by this Office can be considered under the following two sections:

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(a) Intergovernmental Oceanographic Commission

50. Membership of the Commission is open to all Member States of the United Nations, UNESCO, and other agencies of the United Nations system which are willing to participate in oceanographic programmes that require concerted action by them. Representatives of the United Nations and the specialized agencies may participate in meetings of the Commission, without the right to vote.

51. The Secretariat of the Commission will be provided under the authority of the Director-General of UNESCO, by the Department of Natural Sciences and will be headed by the Director of the UNESCO Office of Oceanography. Members of the staff of the FAO, United Nations and other interested agencies referred to above may be added to the personnel of this office, by agreement with these agencies. The secretariat is directed to co-operate actively with the secretariats of those organizations.

52. The international programmes recommended by the Commission to its Member States will be carried out with their own resources. In addition, the Commission may recommend appropriate activities to UNESCO and other organizations referred to above, which, if accepted by these organizations, would be financed by them.

53. An invitation to Member States to be affiliated with the Commission has been issued, and it is intended to convene its first session in September 1961.

(b) Training and research in marine sciences

54. An International Indian Ocean Expedition is being organized by the Special Committee on Oceanic Research (SCOR) of ICSU, and is co-sponsored by UNESCO. Thus, a sizeable portion of the UNESCO marine sciences budget has been allocated to assistance for training and research in the Indian Ocean region.

55. In addition to the regular fellowships in marine sciences to be awarded to candidates from the region, special fellowships for training aboard vessels

participating in the Expedition are being offered. Assistance will be provided to support local and foreign scientists assigned to two oceanographic research centres in the region for the purposes of research and training. Equipment will be provided to these centres, and technicians will be trained in repairing and maintaining this equipment. Equipment will also be furnished to a regional training vessel. A biological reference centre will be established in 1962. SCOR, which is organizing the Expedition, will also serve as a scientific advisory body to the UNESCO marine sciences programme. Both SCOR and its Indian Ocean Working Group will be assisted financially by UNESCO.

(i) Other training activities

56. A number of fellowships in marine sciences will be offered to countries outside of the Indian Ocean region. Training centres and seminars will be organized by the Science Co-operation Offices. Equipment will be provided to a training vessel in the Latin American region.

57. Since one of the major difficulties in significantly increasing the effort in marine sciences is the shortage of trained personnel, a conference of educators in the field of marine sciences will be arranged. This conference will consider minimum educational requirements and ways and means of developing university training and research in the subject.

(ii) Other research activities

58. Experts in marine sciences are being assigned under the Participation and Technical Assistance Programmes (at present, in Argentine and Indonesia).

59. A seminar on standardization and intercalibration of equipment and methods of marine research is being organized, particular attention being given to the problem of quality control and inter-comparability of data of the

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international Indian Ocean expedition. The related problem of the publication of hitherto unpublished data and also forthcoming data from the Indian Ocean and other regions will be dealt with in consultation with SCOR and other interested agencies.

(iii) Budget

60. The budget for the programme of marine sciences for 1961-1962 is $430,000 as against $ 70,000 for the period 1959-1960

## IV. INTERNATIONAL ATOMIC ENERGY AGENCY

61. IAEA's responsibilities in the matter flow from its statutory authorization to establish standards of safety for the protection of health and the fact that its initial programme provided that the Agency should undertake studies and consider the formulation of regulations covering the disposal of radioactive waste into the sea. Furthermore, the First United Nations Conference on the Law of the Sea requested the Agency to take the necessary action to assist States in controlling the discharge or release of radioactive material to the sea, promulgating standards, and in drawing up internationally acceptable regulations to prevent pollution of the sea by radioactive material in amounts which would adversely affect man and his marine resources. The Agency has accordingly developed a comprehensive programme on the subject including the following:

62. The convening of an ad hoc Panel of International Experts on Radioactive Waste Disposal into the Sea; the recommendations of this panel, which were circulated to Member States in May 1960 and will shortly be available for general distribution as No. 5 in the Agency's "Safety Series", will provide direction for the Agency's future programme and could also serve as a basis for international agreement.

63. One of the recommendations of the Panel was that monitoring methods should be standardized. This view was also expressedat the Conference on the Disposal of Radioactive Wastes, held at Monaco from 16-21 November 1959 (co-sponsored by IAEA and UNESCO, with the co-operation of FAO). It was also recognized that a study of the monitoring of radioactive waste disposal into the sea was necessary.

64. Further consideration was given to the subject by a panel of experts convened in Vienna from 17-22 April 1961. Among the topics discussed were the necessary standardization of sampling and analysis of radionuclides in sea water and marine products and possible ways of interpreting data. The United Nations, FAO, UNESCO, WHO and other interested international organizations were invited to attend. The panel took into consideration the WHO/FAO report on methods of radiochemical analysis[1] and the Agency's report on radioactive substances in the biosphere[2].

65. A further recommendation of the Panel on Radioactive Waste Disposal into the Sea was that the Agency should keep records of all such disposals. A study of how this may be done is now being made.

66. A panel on the Legal Implications of the Disposal of Radioactive Waste into the Sea, held in Vienna from 16-21 January 1961, also considered the recommendations set forth in Chapter 8 of the report of the above panel, and discussed organizational, administrative and legal questions arising at the international level in connexion with the disposal of radioactive waste into the sea.

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1/ WHO Technical Report Series No. 173, and FAO Atomic Energy Series, No. 1.

2/ Agency publication STI/PUB/28

67. IAEA's activities are also directed towards evaluation of disposal sites, investigation of the implication and effects of nuclear propelled ships, related research and development of radioisotope utilization in oceanographic research.

68. In this latter connexion research is in progress under eight contracts awarded by the Agency on problems relating to the effects of radioactive nuclides in water, their concentrations in flora and fauna, particularly in human foodstuffs, their deposition in bottom sediments, and their effects on the marine environment.

69. A contract has been signed with the Government of Monaco and the Oceanographic Institute in Monaco for a three-year joint research programme to study the above topics. It is the intention, as far as possible, to study the marine environment as a whole. To date, most experiments have been designed to investigate only one segment of the environment at a time and one level of a food chain at a time. At Monaco it is proposed to carry out a different form of experiment. Certain isotopes will be introduced into the environment, and their movement through each level in the food chain will be simultaneously measured. A group of experts will be appointed to help plan, advise and evaluate this programme.

70. As far as nuclear ship propulsion is concerned, a symposium was held in November 1960 in Taormina, Sicily, on nuclear ship propulsion with special reference to nuclear safety by IAEA in co-operation with IMCO. At the symposium, environmental, economic, technological and operational aspects of the safety problem of merchant ships propelled by nuclear reactors were discussed, as well as problems of protection against radiation exposure and contamination resulting from the operation of nuclear merchant ships in open seas, estuaries and harbours.

71. IAEA co-operates with FAO and WHO on the effects of radioactive products on sea food, on marine life and on men; with UNESCO and WMO on factors affecting the disposal of radioactive waste; with IMCO on problems connected with the operation of nuclear propelled ships; and with the United Nations regarding the implementation of the recommendations of the Conference on the Law of the Sea.

## V. WORLD METEOROLOGICAL ORGANIZATION

72. The direct interest of WMO in oceanography is restricted mainly to physical oceanography, and, in particular, to those aspects which have a bearing on the state and behaviour of the atmosphere. Among these the following may be mentioned:

(a) Surface and deep circulation of ocean waters, discontinuity layers, convergence and divergence;

(b) Heat balance of the ocean and variation therein;

(c) Heat exchanges between the oceans and the atmosphere and their influence on weather and climate; and

(d) Tsunamis and storm surges.

73. The indirect interest of WMO in oceanography is to obtain as many meteorological observations as possible from ships. Notwithstanding the success of the WMO scheme of voluntary observing ships, the number of meteorological observations from ocean areas is still inadequate and moreover there are vast areas completely void of observations because they are not traversed by shipping routes. The observations needed are surface (including air and sea temperature) and upper-air observations (radiosonde and if possible radiowind), as well as wave observations (sea and swell).

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(a) Activities in the field of oceanography

74. For a number of ocean areas arrangements have already been made or are now made under WMO auspices to provide the following services in the field of oceanography:

(1) Daily weather forecasts;

(2) Improvement in accuracy of some meteorological observations (sea temperature, height and direction of waves etc.) of interest to oceanographers;

(3) Monthly summaries of climatological data;

(4) Climatological charts (atlases covering the sea areas); and

(5) Advice with regard to organizing the necessary meteorological observations for study of energy exchanges between the atmosphere and the ocean and making investigations of the boundary layers.

(b) Existing and planned projects in the work programme

75. The WMO Commission for Maritime Meteorology recommended in some detail the services which Member States concerned should attempt to provide to the International Indian Ocean Oceanographic Expedition. In view of the urgency of this recommendation (Recommendation 30 [CMM-III], the Secretary-General took immediate action to implement the various requests made in the recommendation, and action is well in hand.

76. A number of other projects recommended by the Commission for Maritime Meteorology have a bearing on oceanography, such as fishing operations and weather advice, routing of ships by means of extended weather forecasting, publication of a handbook on the preparation of weather maps by mariners, preparation of the marine section of the World Climatic Atlas, and publication of an illustrated international ice nomenclature. These and other projects in the field of maritime meteorology will be considered by the Executive Committee in May 1961, based upon comments prepared in the meantime by the Secretary-General in consultation with the Presidents of other Technical Commissions concerned.

77. A Member Government of WMO has recently requested that a study be made of a matter which may well develop into an important project of interest to oceanography. It relates to the present unsatisfactory situation with regard to the availability of data on sea ice in both hemispheres. Research is definitely required, as are probably operational activities to obtain complete and current information on sea ice. The best answer to meet these requirements may well be the future use of polar orbiting satellites, and WMO is now initiating a study of the problems involved.

(c) Collaboration with other international organizations

78. WMO has continued its close collaboration with FAO and UNESCO. It has also appointed a permanent representative on SCOR and is particularly keeping close contact with the co-ordinator of SCOR for the [illegible] international Indian Ocean expedition. Close liaison is maintained with the International Union for Geodosy and Geophysics, and in particular with the committee established by the International Association for Meteorology and Atmospheric Physics on oceanic-atmospheric-interactions.

## VI. INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION

79. IMCO is interested in three aspects of oceanographic research; namely, marine charts and, generally speaking, all hydrographic material used by seafarers; the discharge of radioactive waste; and prevention of the pollution of the sea by oil.

80. In the first of these fields, IMCO co-operates with the International Hydrographic Bureau; in the second, with IAEA and to some extent FAO; in the third, IMCO took over in 1959 functions arising out of the 1954 Convention

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for the prevention of the pollution of the sea by oil, previously fulfilled by the United Kingdom. Preparations are actively under way for the International Conference for the Revision of the Convention on the Pollution of the Sea by Oil, which will be held in London in March 1962.

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