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THE TECHNICAL ASSISTANCE PROVIDED BY THE AGENCY IN 1964

CONTENTS

	<u>Paragraphs</u>
I. INTRODUCTION	1 - 19
A. Activities in which Governments have shown special interest	7 - 14
(i) Research reactors	7 - 8
(ii) Applications of radioisotopes	9 - 13
(iii) Other activities	14
B. Administrative developments	15 - 19
II. RESOURCES AVAILABLE	20 - 25
A. Expanded Programme of Technical Assistance	21
B. Agency's Regular Programme	22
C. Gifts in kind	23 - 24
D. Other resources available	25
III. ASSISTANCE PROVIDED	26 - 67
A. Amount of assistance	26 - 31
B. Analysis of assistance provided	32 - 61
(i) Fields of assistance	32 - 37
(ii) Geographical distribution of assistance	38 - 49
(a) Distribution by region	38 - 46
(b) Distribution by country	47 - 49
(iii) Types of assistance	50 - 61
(a) Experts and visiting professors	52
(b) Equipment	53
(c) Fellowships	54 - 55
(d) Regional and other activities	56 - 61
C. Special Fund projects	62 - 67
IV. GENERAL TRENDS AND CONCLUSIONS	68 - 73

FIGURES

- 1 Resources available for technical assistance activities of the Agency (1958-1964)
- 2 Distribution of technical assistance by field of activity
- 3 Distribution of technical assistance by regions
- 4 The ratio of distribution of technical assistance by type of assistance
- 5 Distribution of technical assistance experts by region: 1964
- 6 Distribution of technical assistance fellowships by region: 1964
- 7 Trends in the technical assistance activities of the Agency

ANNEXES

I STATISTICAL TABLES

General introductory notes

A. TECHNICAL ASSISTANCE RESOURCES

1. Resources available: 1958-1964
2. Agency funds for technical assistance: 1958-1964
3. Number of experts classified by nationality and fellowships classified by place of study: 1964

B. ALLOCATIONS AND DISBURSEMENTS OF AGENCY MONETARY RESOURCES FOR TECHNICAL ASSISTANCE: 1958-1964

4. Status of allocations and schedule of disbursements for technical assistance activities from the General Fund and Operating Fund II as at 31 December 1964

C. DISTRIBUTION OF TECHNICAL ASSISTANCE

5. Types of technical assistance: 1958-1964
6. Fields of activity of technical assistance: 1964
7. Recipients of experts and fellowship awards:
Number of experts classified by place of assignment and fellowships classified by nationality of the recipient: 1964
8. Financial summary: 1964
9. Financial summary: 1958-1964

II REGIONAL AND INTER-REGIONAL TRAINING COURSES: 1964

Abbreviations used

Agency	International Atomic Energy Agency
CERN	European Organization for Nuclear Research
EPTA	United Nations Expanded Programme of Technical Assistance
FAO	Food and Agriculture Organization of the United Nations
IAEA	International Atomic Energy Agency
NORA	Joint Agency-Norwegian Programme of Research with the Zero Power Reactor "NORA"
NPY	Co-operative Programme for Research in Reactor Physics between the Governments of Norway, Poland and Yugoslavia
OIRSA	Organismo internacional regional de sanidad agropecuaria
Theoretical Physics Centre	International Centre for Theoretical Physics at Trieste
UNESCO	United Nations Educational, Scientific and Cultural Organization
<hr/>	
Congo, D.R.	Democratic Republic of the Congo
CSSR	Czechoslovak Socialist Republic
Germany, F.R.	Federal Republic of Germany
Korea, R.	Republic of Korea
UAR	United Arab Republic
UK	United Kingdom of Great Britain and Northern Ireland
USA	United States of America
USSR	Union of Soviet Socialist Republics

NOTE

All sums of money are expressed in United States dollars.

I. INTRODUCTION

1. In June 1965 the Board of Governors reviewed, pursuant to paragraph 20 of the Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency [1], the technical assistance the Agency had furnished in the previous calendar year. In accordance with a wish expressed by the Board at the conclusion of this review, the data on which it was based are reproduced in the present document for the information of the General Conference.

2. The report reviews all elements of technical assistance provided by the Agency from whatever source, whether from funds voluntarily contributed to it, resources made available to it in kind, or funds allocated to it under EPTA. The types of assistance are discussed under three main categories: experts, equipment and fellowships. The Agency's activities as an Executing Agency of two Special Fund projects relating to nuclear research in agriculture (Yugoslavia) and to a pre-investment study on power, including nuclear power, in the Philippines, are also mentioned in this report as a part of its technical co-operation activities.

3. During 1964 62 [2] countries received technical assistance of one type or another under the Agency's technical assistance programme, in connection with either country, regional or inter-regional projects. The requests for assistance were mainly in connection with the use of radioisotopes in agriculture, medicine, hydrology and industry, the construction and operation of research reactors, reactor physics, irradiation techniques, radiation monitoring, and training in fundamental disciplines (nuclear physics) and basic techniques (electronics).

4. This assistance was given through the services of 178 [3] experts or visiting professors, awards to 533 [3] fellows for individual studies at institutes or group training in courses, and the provision of equipment in an amount of approximately \$710 000 [3].

5. The resources used to carry out the Agency's technical assistance programme amounted to approximately \$2 873 500 [4], whereas the total amount actually spent for that purpose was about \$3 120 000 (see Table 8) [5]. This includes payments against 1964 and prior years' obligations and assistance "in kind" and represents an increase of approximately 29% over the \$2 423 000 spent in 1963 (Table 5).

6. It seems useful to point out at this juncture those of the Agency's activities in which several Member States have displayed increasing interest during 1964 and to mention the changes made during the year in the administrative structure supporting the Agency's technical assistance activities.

A. Activities in which Governments have shown special interest

(i) Research reactors

7. In previous years Agency experts assisted a number of developing countries in the work of planning for and advising on the construction and start-up of research reactors. During the year under review an increasing proportion of assistance provided was in experimental physics, radiation chemistry and the production of radionuclides, fields which directly involve the utilization of research reactors already in operation in some developing countries.

[1] GC(IV)/RES/65, Annex.

[2] See Table 7.

[3] Includes assistance "in kind".

[4] An additional \$381 500 were available as carry-over from 1963 EPTA funds.

[5] All the statistical tables are to be found in Annex I to this document.

8. An inter-regional training course on the use of research reactors for the production of radioisotopes and activation analysis was organized and held in Bombay. The Agency also provided fellowships and expert assistance for a regional project for Asia and the Far East in regard to which a member Government has made available a neutron crystal spectrometer.

(ii) Applications of radioisotopes

9. Many countries have realized that the use of radiation and radioisotope techniques provide new solutions to a large number of problems in agriculture and hydrology which are of direct concern to economic development. At the request of States participating in the Agency's programme, assistance in the form of experts, equipment and fellowships was provided for the training of technicians and research workers in these techniques, particularly for the development of research to improve rice cultivation in Asia and the Far East. Studies on the efficiency of nitrate and phosphate fertilizers, and radiation-induced mutations were undertaken. An inter-regional adviser based in Manila (Philippines) was able, during 1964, to provide some six countries with scientific advice regarding the co-ordinated rice research programme. Agency experts contributed to the dissemination of techniques involving the use of neutron probes to study the distribution of humidity in the soil. The Agency assisted also in carrying out preliminary studies on the control of insect pests, such as the olive fly in the Mediterranean region.

10. In one country the programme was planned, organized and carried out as an integrated project covering the provision of a fellowship, the services of an expert and equipment in accordance with the procedure mentioned in paragraph 15 below. Following the visit of the Preliminary Assistance Mission in 1962, this Government sought the assistance of the Agency in establishing a laboratory in its university for teaching and research into the application of radioisotopes. A national of the region was awarded a fellowship in 1963 and was available to act in 1964 as counterpart to the expert. Equipment was provided, the laboratory established with the assistance of the expert and 41 participants underwent various forms of training in the laboratory. More intensive courses on specific applications of radioisotopes will be carried on in later years.

11. The need to increase food crops and improve yields was evident in a project which was given high priority by another Government for the development of its agricultural programme. The Agency provided an expert to work with equipment purchased by the Government in order to establish small radioisotope laboratories or facilities in existing research stations. These facilities can be utilized, as required, by the research workers who are already using conventional apparatus and applying conventional techniques. In conjunction with this project, the Agency assisted in arranging for the subsequent training of nationals under bilateral agreements. As a result of Agency assistance the Government intends to expand its programme in future years to embrace other agricultural problems.

12. Expert assistance has been provided for research on the use of radioisotopes in studying the plant physiology of rubber (hevea) and, in particular, the relationship between the use of nutrients and latex production. An attempt has been made to perfect certain biochemical methods which could be used to obtain criteria on tree productivity and to undertake studies on the synthesis and transport of latex in the bark. These problems are of great practical interest to the rubber industry.

13. In hydrology, in particular in arid and semi-arid regions, six Agency experts helped various Member States to use isotope techniques for assessing subterranean and surface water resources. In one country, for example, isotopes are being used to determine the seepage from reservoirs used for hydroelectric power production.

(iii) Other activities

14. Agency assistance was given to a number of countries in organizing and improving the teaching of nuclear physics and in developing nuclear instrumentation. An expert in nuclear instrumentation has promoted the local construction of basic nucleonic equipment.

Scalers, linear amplifiers, power supplies and portable monitors are now being manufactured locally at less than half the cost of similar imported equipment.

B. Administrative developments

15. As indicated in last year's report [6], the divisions responsible for planning and implementing the various activities of the technical assistance programme were combined in February 1964 into a single Department of Technical Assistance. With this reorganization, it has at last become possible to review requests for experts, equipment, fellowships and training and research grants as one entity and thus to draw up integrated country programmes.

16. In order to co-ordinate and foster the use of atomic energy in agriculture the Food and Agriculture Organization of the United Nations and the Agency established, in October 1964, a joint FAO/IAEA Division of Atomic Energy in Agriculture, located at the Agency's headquarters in Vienna. The joint division makes available the technical services of both organizations in the elaboration and implementation of technical assistance projects in the application of atomic energy in agriculture.

17. The Agency's regional officer for Asia and the Far East visited 14 countries and kept in close touch with their atomic energy programmes, assisting in the preparation of technical assistance requests, particularly in connection with the EPTA biennial programme for 1965-66, and reporting to headquarters on problems affecting the implementation of the Agency's technical assistance activities for 1964.

18. The Agency has been making constant efforts to simplify procedures for the provision of technical assistance, particularly with regard to the agreements entered into with Governments, specifying the terms and conditions under which projects are to be implemented. During 1964 a new supplementary agreement specifying the conditions in regard to health and safety measures, safeguards against diversion and settlement of disputes was sent to Governments and six have already signed it. When a Government requesting assistance has signed the supplementary agreement, the Agency has then only to notify it of the provisions which apply to the particular project concerned.

19. During 1964 work on the preparation of the Provisional Staff Regulations and Staff Rules governing the conditions of service of technical co-operation experts was approaching completion for promulgation in 1965.

II. RESOURCES AVAILABLE

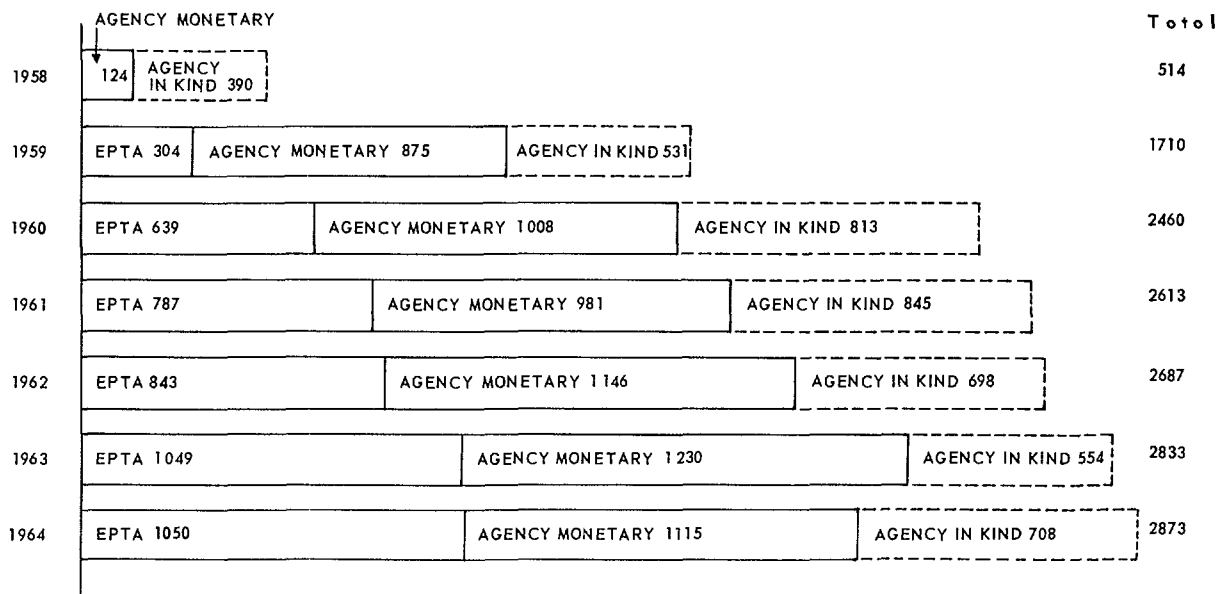
20. In 1964 the resources placed at the disposal of the Agency for the financing of the technical assistance programme amounted to \$2 873 500 (see Figure 1 below and Table 1). This sum is made up of \$2 165 500 in cash and \$708 000 in kind, and represents a slight increase of 1.5% over that for 1963.

[6] GC(VIII)/INF/72, para. 12.

FIGURE 1

RESOURCES AVAILABLE FOR TECHNICAL ASSISTANCE ACTIVITIES OF THE AGENCY (1958 - 1964)

(in thousands of dollars)



A. Expanded Programme of Technical Assistance

21. Under the second year of the EPTA biennial programme for 1963-64 the Agency was authorized to incur obligations in the amount of \$1 050 500. This amount, which is almost half the total sum allocated for that period, was increased by the balance of allocations authorized but not used during the first year and brought up the total to about \$1 432 000.

B. Agency's Regular Programme

22. Of the voluntary contributions of Member States to the General Fund, the sums allocated for technical assistance in 1964 amounted to \$1 115 000, representing a small decrease over the preceding year (see also Table 2, Annex I).

C. Gifts in kind

23. The value of the various contributions in kind (experts, equipment, fellowships) was estimated, in accordance with the principles set out in the introductory note to the statistical tables, at \$708 000, or 28% more than in 1963.

24. Counting equipment to a value of \$18 000 was donated to the Agency's Mobile Radioisotope Laboratories.

D. Other resources available

25. The Agency also received funds under two Special Fund projects - \$338 475 for Yugoslavia and \$158 340 for the Philippines. Another project, carried out under a funds-in-trust arrangement, amounted to \$25 000. An increasing number of countries are providing experts and granting training facilities (Annex I, Table 3); for example, during 1964 35 countries provided experts and 27 received Agency fellows for training.

III. ASSISTANCE PROVIDED

A. Amount of assistance

26. Implementation of the technical assistance programme approved for a given year depends on resources made available in that year. The total assistance provided in 1964 under EPTA and the Regular Programmes amounted to \$3 120 000, an increase of 29% over the \$2 423 000 provided in 1963 (Tables 5 and 8). If costs for activities carried out by the Agency under the Special Fund and the funds-in-trust arrangement [7] are added the total amount expended for that purpose becomes \$3 444 000. It will be recalled, however, that under the procedure adopted in 1960 a greater flexibility in EPTA programming has been achieved by permitting short-term technical assistance projects approved for implementation in a given biennium to be initiated at any time during the two-year period. The first year is usually characterized by preparatory work in connection with the various projects, such as the recruitment of experts and arrangements for the placement of fellows so that the bulk of the implementation actually takes place during the second year.

27. The total amounts obligated (payments plus unliquidated obligations) - as distinct from expended (payments only) - for technical assistance under EPTA and Regular Programmes during 1964 are as follows.

28. Under EPTA, for which 1964 was the second year of the biennium, \$1 207 000 were obligated towards country and regional projects. As indicated in paragraph 26 the first year of a biennial programme is, for a considerable proportion of projects, devoted to preparatory work. The total obligations of \$1 874 000 incurred for both years of the 1963-64 programme, as compared with those of \$1 596 000 for 1961-62, show an increase of 17%. The amount actually expended in 1964 is \$1 118 000, the balance consisting of unliquidated obligations against which payments will be made in 1965 and 1966.

29. Under the Regular Programme, the funds obligated for technical assistance in 1964 from the Agency's own monetary resources also increased and amounted to \$2 082 000 as compared with \$2 018 000 in 1963, whereas funds actually expended for payment against 1964 and prior years' obligations amounted to \$1 294 200 (Tables 5 and 8). Taking into account the additional \$708 000 for gifts in kind, the total amount obligated in 1964 under the Regular Programme is \$2 790 000, an increase of 8½% over the \$2 572 000 obligated in 1963.

30. It should be noted that for the 1964 Regular Programme, as in the case of 1963, the Board of Governors authorized the Director General to release, after consultation with the Governments concerned, funds earmarked, but not obligated, for technical assistance projects that had not been initiated within two years following their approval, so that these funds might be made available for other approved projects. As a result of this authorization \$53 500 were released in 1964 in respect of three projects that had been approved under the 1961 and 1962 Programmes. In addition, two projects for which an amount of \$21 200 had been approved under the 1963 Programme were cancelled at the request of the Governments concerned. The \$74 700 thus released were made available to finance projects approved under the 1964 Programme.

31. Table 4 gives the schedule of cash disbursements in each financial year in respect of technical assistance activities since 1958; it also shows for each preceding year the unliquidated obligations and unobligated earmarkings which remained outstanding at 31 December 1964. As compared to 1963, unliquidated obligations were reduced from \$868 000 to \$789 000 and unobligated earmarkings from \$549 000 to \$319 000.

[7] When a Requesting State undertakes to pay for technical assistance services arranged by the Agency at that State's request.

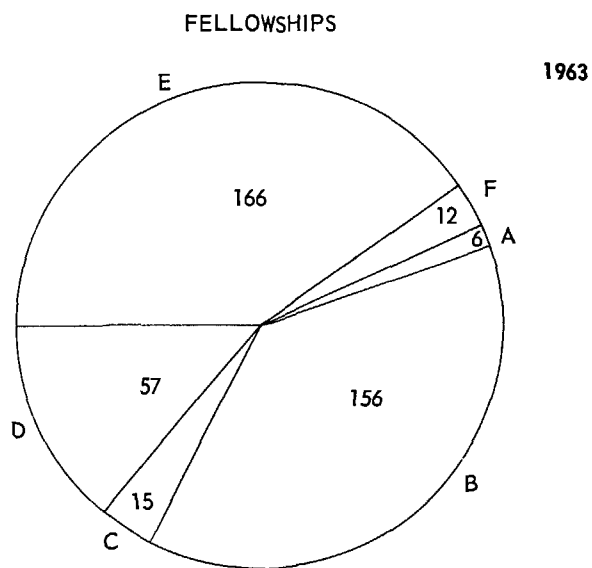


Diagram 1

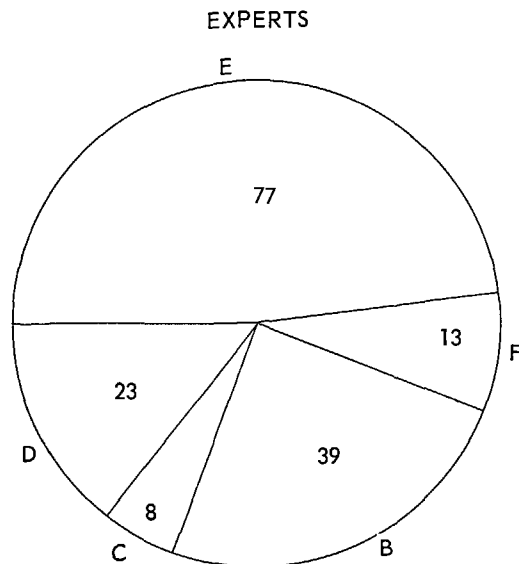


Diagram 2

FIGURE 2
DISTRIBUTION OF TECHNICAL ASSISTANCE BY FIELD OF ACTIVITY
(1963 and 1964)

- A. General atomic energy development
- B. Nuclear science
- C. Prospecting, mining and processing nuclear raw materials
- D. Nuclear technology
- E. Applications of isotopes and radiation
- F. Health, safety and waste disposal.

The numbers following the letters indicate the numbers of fellowships or experts or the dollar value (in thousands) of equipment.

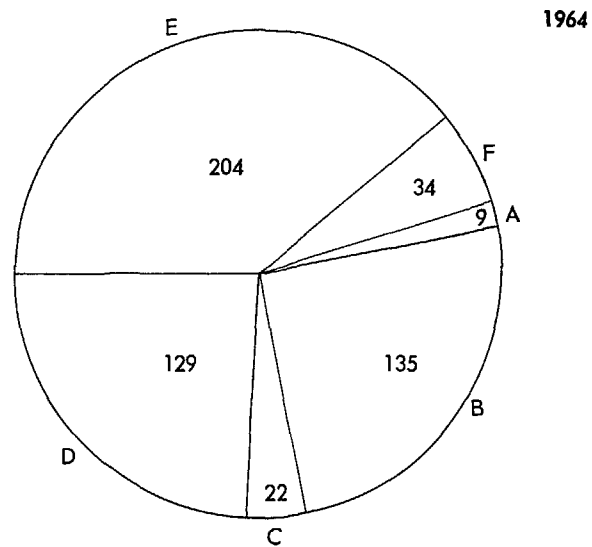


Diagram 3

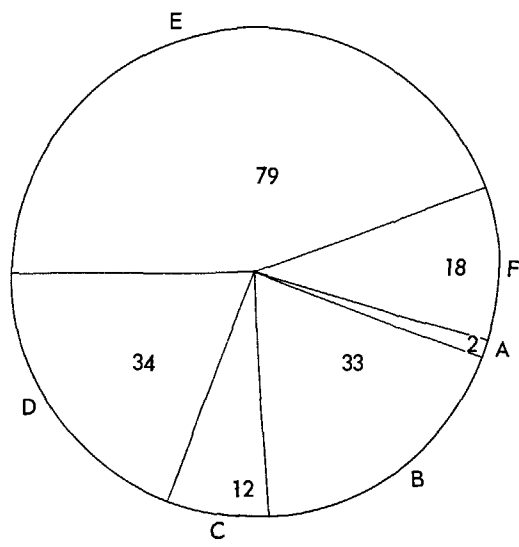


Diagram 4

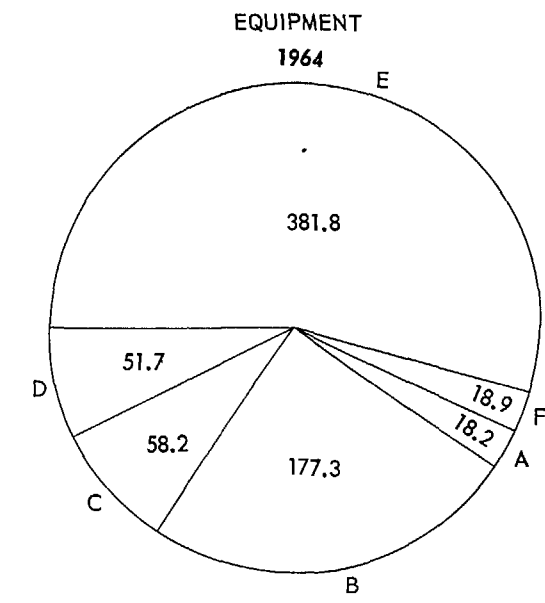


Diagram 5

B. Analysis of assistance provided

(i) Fields of assistance

32. The interest shown by Member States in research reactors and the applications of radioisotopes in agriculture and hydrology has already been mentioned in the introduction to this report. A large number of Member States requested assistance in nuclear medicine, nuclear physics and biochemistry. Ten countries in the Middle East and Europe received advice on problems of dosimetry and radiation protection and other physics problems raised by the therapeutic and diagnostic uses of radiation. A number of doctors and physicists were trained in these and other uses of radioisotope techniques, in radiobiological research and in the control of tropical and endemic diseases.

33. Experts have met requests for assistance in establishing radiation protection measures, not only from national atomic energy authorities but also from authorities responsible for national health programmes. In most cases, these experts helped to establish environmental and personnel monitoring services.

34. Many Member States which have been operating research reactors for several years are now finding it necessary to pay greater attention to the question of controlling the increasing amounts of radioactive wastes. In one Member State an expert in radioactive waste management assisted in planning and constructing a waste treatment plant and waste disposal ground.

35. Technical assistance was rendered to three Member States in drawing up programmes and training local staff in the use of equipment in prospecting for nuclear raw materials. In cases where analysis and evaluation had already been completed the Agency's assistance enabled savings to be made in both time and money and resulted in the rapid development of the programmes to suit local requirements.

36. With regard to nuclear metallurgy and the processing of irradiated materials the Agency also provided assistance by sending experts, supplying equipment or awarding fellowships.

37. Assistance was continued in the organization of library facilities and documentation services in various nuclear establishments and institutions, and the Agency provided experts' services and equipment for this purpose.

(ii) Geographical distribution of assistance

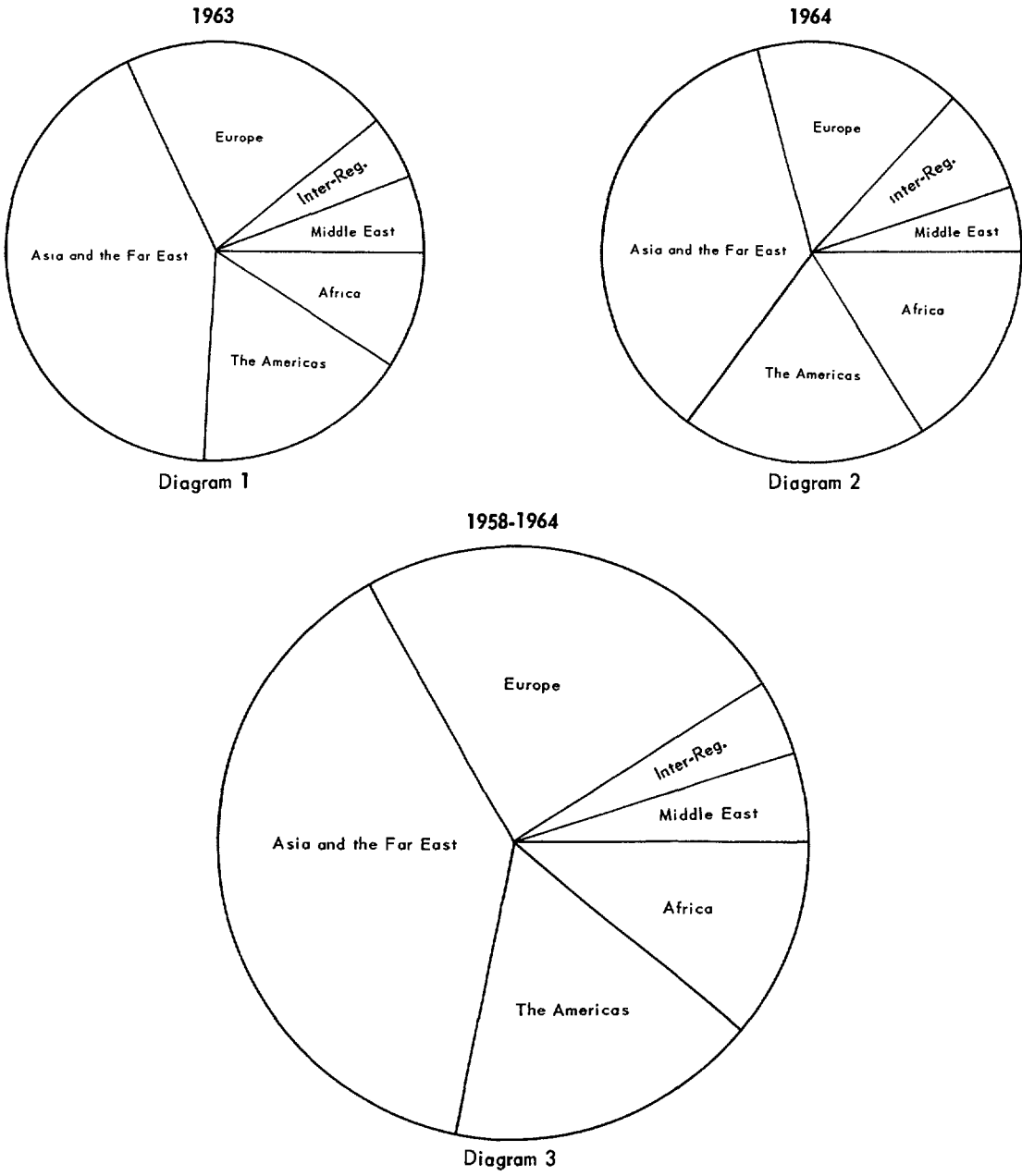
(a) Distribution by region

38. The distribution of assistance by region provided by the Agency in 1964 is shown in Figure 3.

39. Many developing countries have become aware of the value of regional projects and are showing great interest in undertaking joint action in common activities. This is demonstrated by the increasing number of such projects developed in the year under review.

40. When countries of a region have problems of a similar nature, it is often more efficient and more economical in time and money to plan a joint programme. The provision of such assistance, whether in the form of experts, fellows or equipment, can be further extended to facilitate the transfer of knowledge and skills in a common environment. Personal contacts and the exchange of experience between nationals of neighbouring countries are valuable means of providing the kind of training that could be most useful to the area. The work of regional advisers could be more effective, and the purchase of equipment could be reduced to a minimum; the resulting financial savings could then be devoted to other projects.

FIGURE 3
DISTRIBUTION OF TECHNICAL ASSISTANCE BY REGIONS
(1963, 1964 and 1958-1964)



41. In Asia and the Far East the Agency is participating in research on methods of improving the rice crop; six countries received technical advice from an inter-regional expert on such matters as the use of fertilizers and the selection of plants. Fellowships were awarded to nationals from Asia and the Far East to enable them to undergo training or to conduct nuclear research relating to the project.
42. A regional training course was held in Bombay for technicians having similar problems in connection with the operation of similar types of research reactors.
43. At the Middle Eastern Regional Radioisotope Centre for the Arab Countries the Agency organized two training courses on the use of radiation in the biological sciences, industry and agriculture, and another on the application of radioisotopes in medicine.
44. The Agency has also provided an inter-regional adviser on hospital physics for the Middle East and Europe.
45. In Latin America a regional training course on the applications of radioisotopes in agriculture has been organized in Brazil.
46. While altogether 76 countries have benefited at one time or other from the technical assistance provided by the Agency, a number of them have displayed a marked continuity of interest in the Agency's programme, related partly to decrease in bilateral aid, partly to the development of the atomic energy programmes in the countries concerned. In fact, 31 countries have participated regularly since 1958-59, receiving assistance each year in the form of experts' services, equipment or fellowship awards or a combination of all three.

(b) Distribution by country

47. In 1964 62 countries (including two which are not Member States) benefited from the Agency's technical assistance programme. Thirty-five of these countries received assistance amounting to more than \$20 000 each from the Agency's Regular Programme and from EPTA funds.
48. Of the total of 73 countries which participated in the Agency's technical assistance programme in 1964, there were 38 recipient countries, 11 donor countries (of free expert services, gifts of equipment or free fellowships), and 24 both recipient and donor countries (see also Table 3).
49. In atomic energy, where the stage of practical application has only recently been reached and commonly entails a substantial scientific and technical knowledge, the two-way exchange of information (experts received and provided, and fellows received and sent abroad) is, as would be expected, particularly marked in Europe, but it has also reached significant proportions in Africa, Latin America, Asia and the Far East; for example, there were 14 countries in Europe which both sent and received students for training, two in Asia and the Far East, three in Latin America and one in the Middle East (see Figure 6).

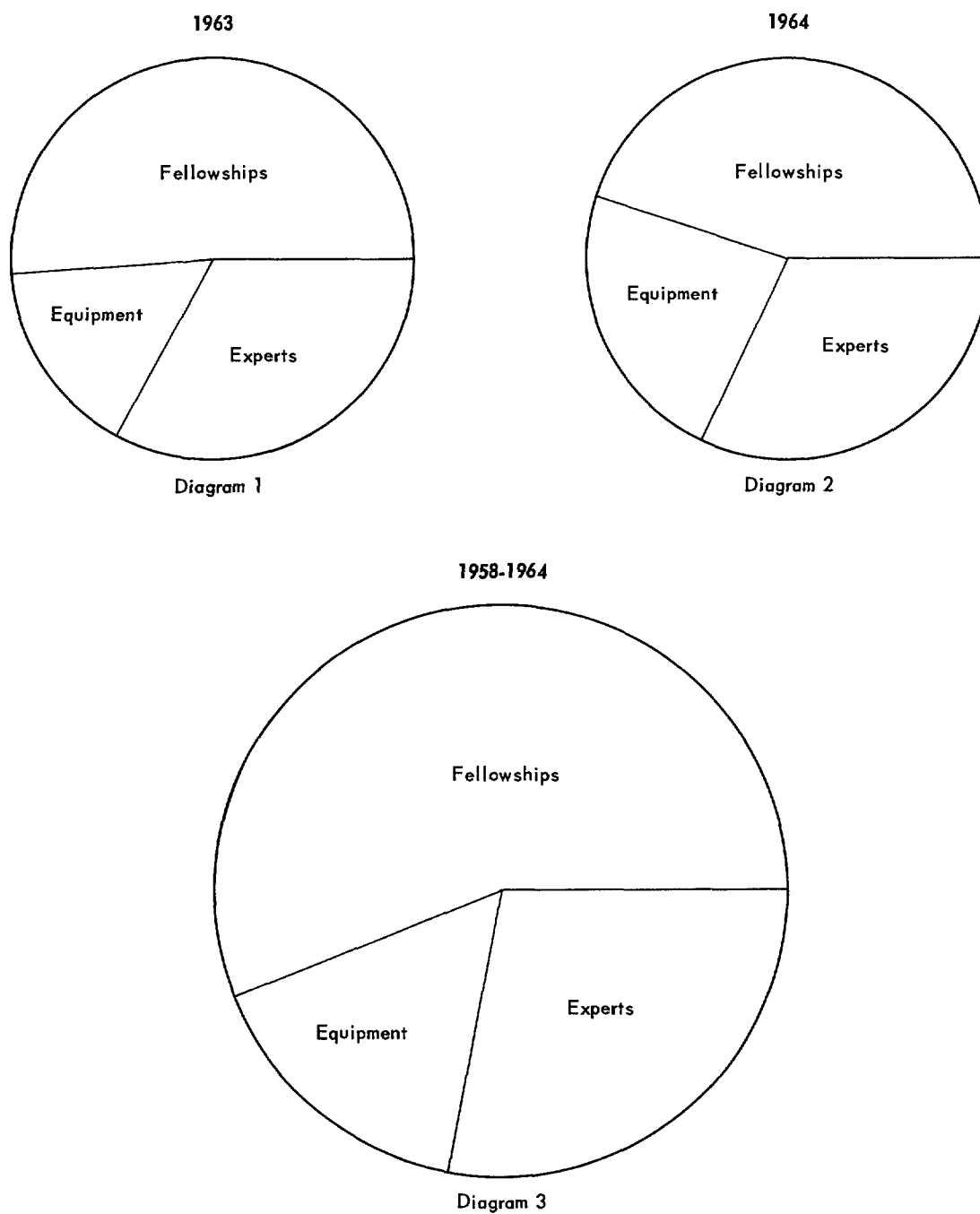
(iii) Types of assistance

50. The form which the Agency's technical assistance takes is analysed under three main headings: experts (including visiting professors), equipment, and fellowships (including research grants and covering both individual training at institutes and group training in courses).
51. The present percentage distribution of the three types of assistance (in terms of cost) is shown below, the corresponding figures also being given for purposes of comparison for the preceding biennium (EPTA) or year (Regular Programme):

	<u>EPTA</u>		<u>Regular Programme</u>	
	<u>1961-2</u>	<u>1963-4</u>	<u>1963</u>	<u>1964</u>
Experts	58%	41%	42%	40%
Equipment	17%	29%	19%	22%
Fellowships	25%	30%	39%	38%

FIGURE 4

DISTRIBUTION OF TECHNICAL ASSISTANCE BY TYPE OF ASSISTANCE
(1963, 1964 and 1958-1964)

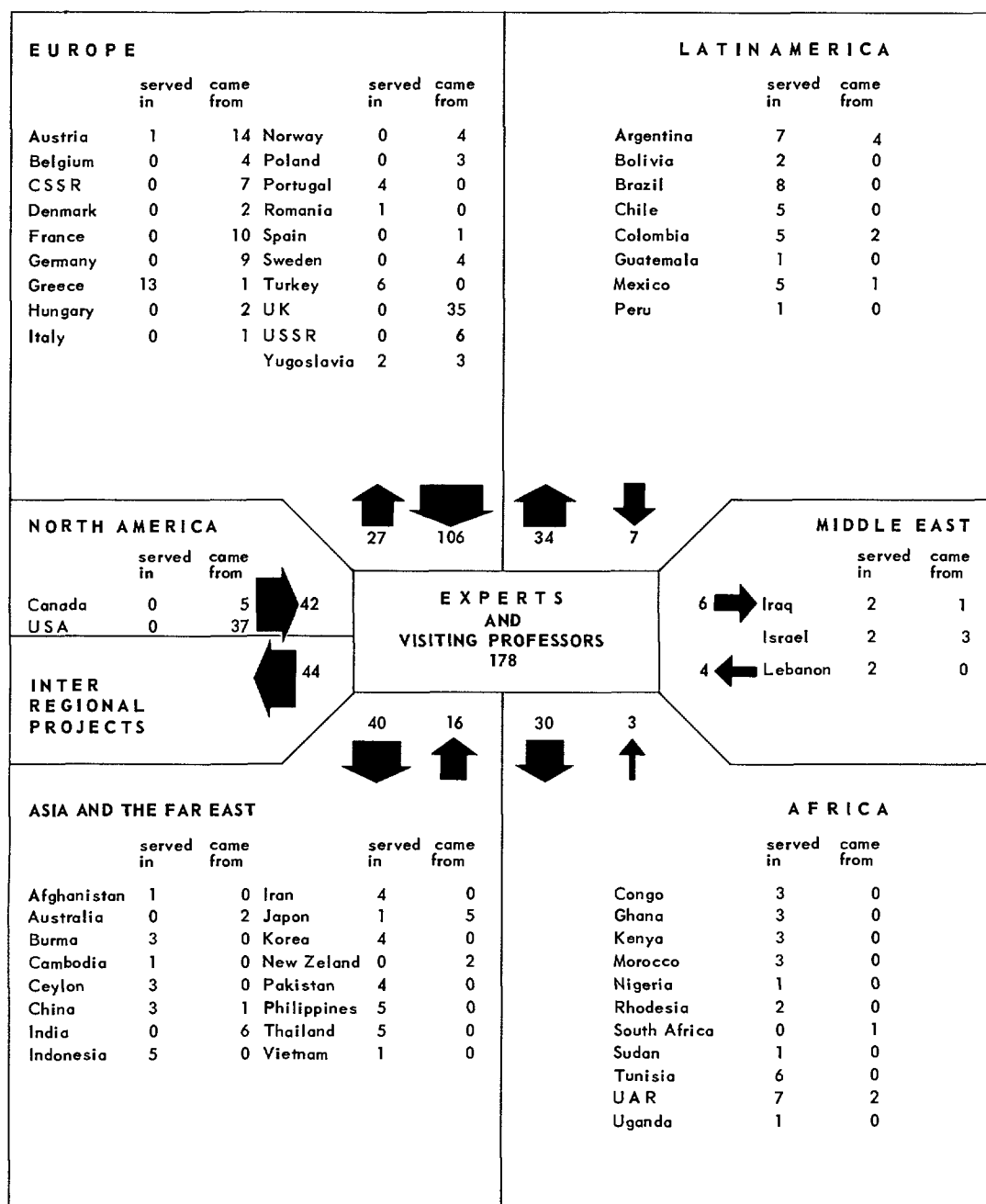


Note: Fellowships include participants at training courses and special projects as well as long-term awards.

(a) Experts and visiting professors

52. During 1964 assignments totalling 672 man-months were carried out by 178 experts from 35 countries, at a cost of about \$991 000. One hundred and thirty-four experts were sent to 40 countries, while 44 served in connection with regional and inter-regional projects. Eleven free or part free experts were provided in 1964 as compared with 14 in the year before.

FIGURE 5
DISTRIBUTION OF TECHNICAL ASSISTANCE EXPERTS BY REGION: 1964



(b) Equipment

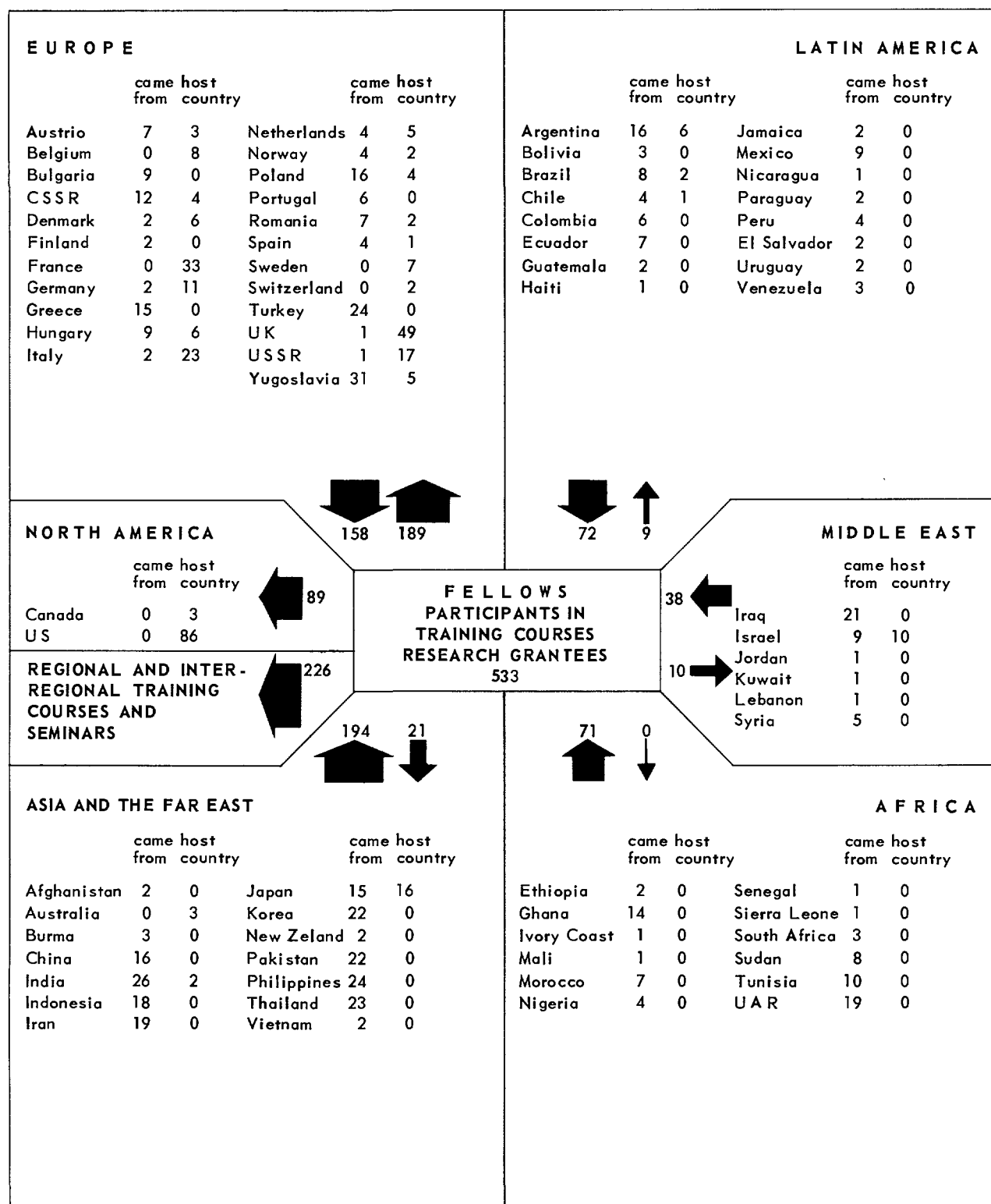
53. The cost of equipment provided in connection with technical assistance projects in 38 countries and some regional and inter-regional projects amounted to \$710 000. The value of the equipment made available to the Agency free of charge was estimated at \$71 000 as against \$1000 in 1963. The tendency, already noted in previous years, for increased expenditure on equipment as compared to expert services and fellowship awards became even more pronounced. The cost of the equipment component of technical assistance provided from the Agency's own resources for country programmes only was 24% (not including "free" equipment) as compared with 19% in 1963. Under EPTA, equipment for country programmes amounted to 33% in 1964 compared with 25% in 1963.

(c) Fellowships

54. During 1964, 533 fellows from 55 countries were awarded fellowships amounting to a total of 4304 man-months of study. Of these, 295 were in connection with country programmes, 180 with regional and inter-regional projects, 46 with international projects, and 12 with research grants. The amount spent for fellowships, including free fellowships, increased from \$1 226 400 in 1963 (for 412 awards) to \$1 419 000 in 1964. The increase in the number of awards is due mainly to a higher implementation rate during the second year of the biennial EPTA programme. Awards for regional projects under EPTA increased from 46 to 127 and for country projects from 30 to 48.

55. Forty-six Type I fellowships were awarded for special purposes in connection with the NPY project, the NORA project, the Upsala International Seminar, CERN, the new regional training and research project using the neutron crystal spectrometer installed at the Philippine Atomic Energy Commission, a long-term training course at the Agency's Laboratory at Seibersdorf, and the International Centre for Theoretical Physics in Trieste. The object of these awards is to facilitate and encourage day-to-day co-operation between scientists from different countries working in a particular discipline.

FIGURE 6
DISTRIBUTION OF TECHNICAL ASSISTANCE FELLOWSHIPS BY REGION: 1964



(d) Regional and other activities

56. Evidence of the increased use of technical assistance provided under regional and inter-regional arrangements is shown by the amount expended in 1964 which rose to \$423 000 (13½% of the total amount of assistance). This expenditure was devoted mainly to the increasing number of fellowships awarded for regional and inter-regional training courses and to the assignment of lecturers for these courses and regional advisers, as well as to similar arrangements for joint projects such as the Trieste Centre and the joint training and research programme using a neutron crystal spectrometer. [8]

57. Training courses. During 1964 11 regional or inter-regional training courses were organized by the Agency. Nine of these were financed under EPTA (two being held at the Middle Eastern Regional Radioisotope Centre for the Arab Countries) and two were financed under the Agency's Regular Programme (see Annex II). Six of the 11 courses were devoted to the use of radioisotopes in agriculture (three), in medicine (two) and in general (one). A course in nuclear physics was organized in Copenhagen, in collaboration with UNESCO, with the object of training university teachers from the developing countries. Forty-four experts were sent on technical assistance assignments and contributed to the training of some 250 students, 180 of whom had received Agency fellowships for participation in training courses.

58. Inter-regional advisers. The first experts to occupy the posts of inter-regional advisers completed their work in 1964. The health physics expert gave advice to 11 countries in the Middle East, Europe and Africa, and the rice cultivation expert advised six countries in Asia and the Far East in connection with the Agency's co-ordinated rice research programme.

59. Middle Eastern Regional Radioisotope Centre. The Middle Eastern Regional Radioisotope Centre for the Arab Countries set up by the Agency in Cairo entered its second year of operation in 1964. In the course of the year the Centre received under EPTA's inter-regional programme, through the Agency, assistance of approximately \$46 000, as follows:

- (a) \$17 000 to cover the cost of visiting professors assigned to lecture at the Centre, and especially that of a technical adviser to the Director of the Centre;
- (b) \$8500 for fellowships; and
- (c) \$20 500 for equipment and miscellaneous expenditure.

The above figures include an amount of \$17 800 for unliquidated obligations against which payment will be made in 1965. In addition, the host country contributed 35 000 Egyptian pounds (equivalent to \$80 500) and six other member countries (Iraq, Kuwait, Lebanon, Libya, Tunisia and Yemen) undertook to contribute a total of about \$13 000.

60. In 1964 the Centre organized two training courses, one on general radioisotope techniques of two months' duration and another on the applications of radioisotopes in medicine of four months' duration. A total of 30 students (UAR, 15; Kuwait, 1; Iraq, 9; Jordan, 1; Sudan, 4) attended these courses. The Centre is also conducting a number of research projects in agriculture and medicine.

61. Follow-up missions. The Agency dispatched two "follow-up" missions, each of a duration of approximately four weeks, to five countries in Latin America and seven in Asia and the Far East, in order to renew direct contacts with atomic energy authorities and to advise them in preparing requests for assistance under the Agency's Regular Programme in 1965 and the next EPTA biennial programme. The cost of these missions was charged to the Regular Budget and is not reflected in the tables in Annex I.

C. Special Fund projects

62. It will be recalled that in 1963 the Agency entered into a Plan of Operation with the Government of Yugoslavia for the execution of a Special Fund project for the extension of research and training facilities at the Institute for the Application of Nuclear Energy in Agriculture, Veterinary Medicine and Forestry at Zemun (Yugoslavia). [9] In 1964 the central laboratory was completed and occupied by the various sections, and research programmes were initiated in soil fertility studies, plant breeding, animal production, nutrition and health and protection.

63. Most of the equipment delivered has been installed and is in use. There are, however, still some problems to be overcome to ensure efficient use of some instruments. It is expected that the construction of the phytotron building, the gamma irradiation facility, the animal housing barn and the workshop facilities will be completed during the third year of the project. The training of scientists and technicians at the Institute has proceeded according to plan. The Agency assisted in sending 12 experts to the Institute and awarding fellowships to 16 technicians for study abroad. Equipment and miscellaneous items in the amount of \$48 500 were ordered in the course of the year.

64. Early in 1964 the Agency signed a Plan of Operation for the execution of a Special Fund project for a pre-investment study on power, including nuclear power, in Luzon (Philippines), and implementation of this project was initiated in the course of the year. The purpose of this pre-investment study is to examine the relative economics of the different ways of meeting the future load demand of the Luzon Grid, taking into account first the extent of the contributions of the indigenous conventional energy resources available in this respect and the possibility of using nuclear power to supplement these resources should it prove to be more economical than power generated from alternative schemes. Thus, this study will establish whether or not it is technically feasible and economically desirable to use nuclear power in the Luzon Grid during 1965-75 to meet a part of its growing power requirements. By the end of 1964, the Agency had completed major investigations dealing with the first phase of the project, the appraisal of the indigenous conventional energy resources (such as hydro, coal, oil, gas and geothermal) available for the Luzon Grid, and a power market survey. The studies on coal, oil, gas and geothermal resources were sub-contracted to the United Nations, while the power market survey was carried out by a private engineering consulting firm. For the appraisal of hydro resources, essential data were obtained from the joint United States Bureau of Reclamation and the Philippine Government Water Resources Survey. All these studies were carried out in close co-operation with the Philippine organizations concerned, especially with the Philippine Atomic Energy Commission.

65. Five fellowships in nuclear power reactor construction and operation were awarded to Philippine scientists. An intangible but significant benefit derived by the scientists from participation in this project is the experience gained in carrying out a power market survey and conducting such feasibility studies. In addition the Agency provided necessary drilling equipment. The total obligations for the project in 1964 were \$135 000.

66. During 1964 the Agency also acted as a sub-contractor to FAO under two Special Fund projects covering the use of radioisotopes in hydrology; the Antalya (Turkey) regional planning project and the Azraq (Jordan) groundwater project.

67. Preliminary work was undertaken also on two new Special Fund projects. One, for which the Agency has already been appointed Executing Agency, involves a pilot project at the request of the members of the Central American Phytosanitary Organization (OIRSA) to determine the scientific feasibility and economic advantage of using the sterile male technique to eliminate the Mediterranean fruit fly, which causes widespread damage to the fruit crops of Central America. The other project will be referred to the Special Fund

[9] GC(VIII)/INF/72, para. 48.

Governing Council for approval during the first half of 1965. It concerns the installation of a prototype irradiation unit for the destruction of insect pests in stored grain.

IV. GENERAL TRENDS AND CONCLUSIONS

68. The analysis of the resources used to carry out the Agency's technical assistance programme during 1964, and the way in which the assistance has been distributed, indicates the following:

- (a) A slow and gradual but continuous growth of various technical assistance activities;
- (b) An increase of technical assistance at the regional and inter-regional levels; and
- (c) A growing diversification of requests for technical assistance by the Agency.

69. As Member States develop their nuclear activities and, in particular, undertake the construction and operation of research reactors, it is desirable that there should be an increasing exchange of experience and knowledge in reactor physics, radiochemistry, irradiation techniques, radiation protection and other important subjects relating to nuclear energy.

70. The Agency's technical assistance programme is wholly suited to meet the views expressed at the United Nations Conference on the Applications of Science and Technology for the benefit of the less developed areas [10], regarding the need for the international dissemination of knowledge. It constitutes an effective contribution to the United Nations Development Decade by promoting the application of science and technology to economic development.

71. The diversity and novelty of the scientific and technical applications of atomic energy confer a special character on the type of assistance the Agency is called on to provide in a large number of fields which are of concern to one or more organizations in the United Nations family.

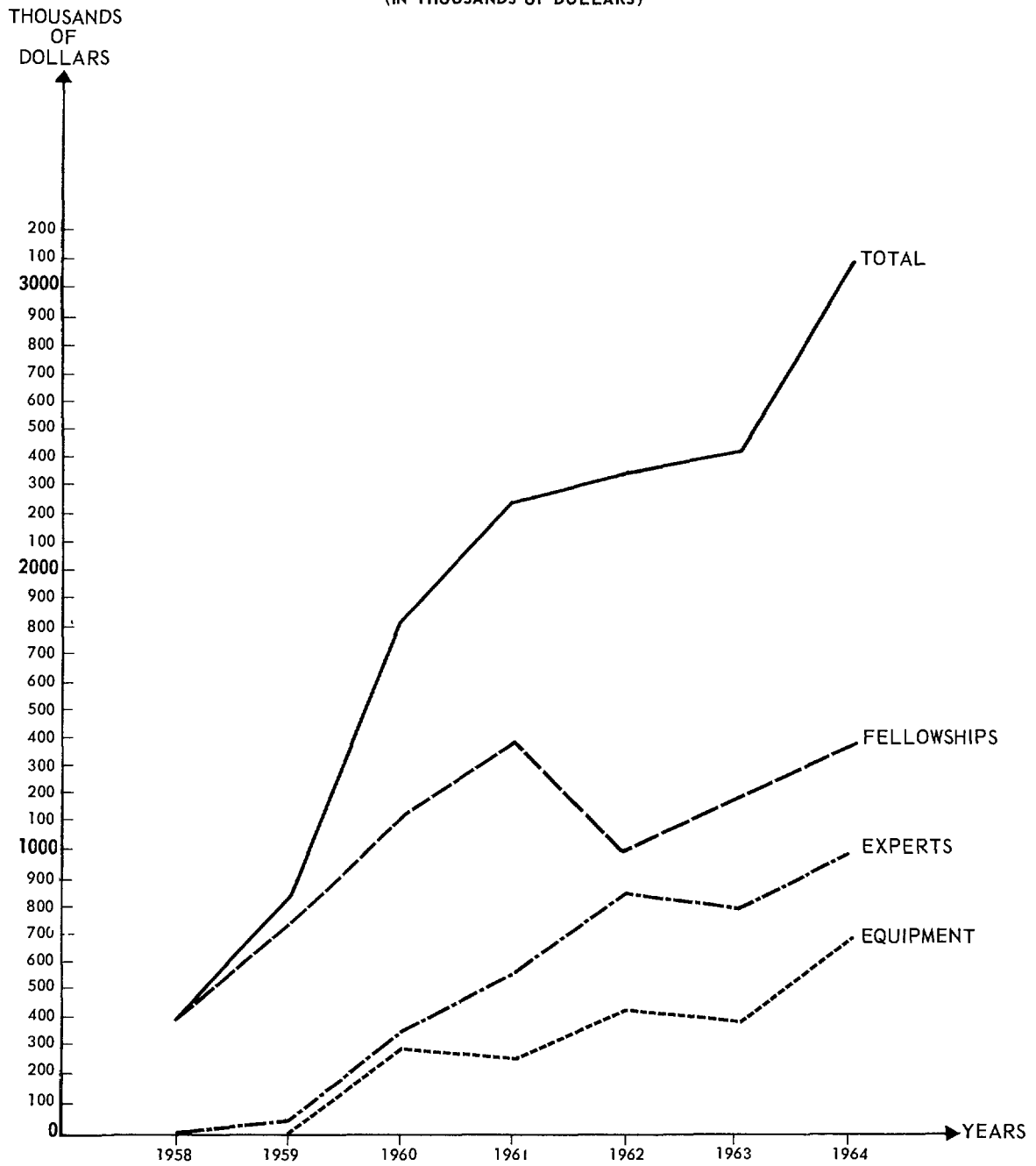
72. Within the technical assistance activities the role of the regional projects is becoming increasingly important. The Agency is encouraging both types of regional project - those relating to training as well as those which could be termed advisory - and the gradual increase in demand for that type of assistance is an indication of its growing appreciation by the developing countries.

73. In view of the foregoing it may reasonably be concluded that in many countries the development of nuclear power programmes will be given higher priority. Experience already shows that increasing use is being made of atomic energy in agriculture, medicine, hydrology and industry. It is expected that in future the Agency may be called upon to help in conducting more surveys for nuclear power and desalting, and in advising on the evaluation of reactor systems or the siting, construction and operation of nuclear plants.

[10] Held in Geneva in 1963.

FIGURE 7

TRENDS IN THE TECHNICAL ASSISTANCE ACTIVITIES OF THE AGENCY
(IN THOUSANDS OF DOLLARS)



A N N E X I

STATISTICAL TABLES

General introductory notes

1. General

In the statistical tables in this Annex the assistance provided by the Agency (experts, equipment and fellowships) includes actual cash payments against 1964 and prior years' obligations, regardless of the time when funds were made available or obligated, plus the total value of assistance in kind. Thus the total amount of funds actually spent on technical assistance is reflected more correctly. The unpaid balance of funds obligated in 1964 is not included. Figures relating to prior years have been adjusted accordingly.

2. Resources

All monetary values appearing under the headings "Agency resources in kind", or "free experts" or "Type II fellowships" are estimated in accordance with the following rules:

- (a) Experts. The value of the services of each cost-free expert is estimated on the basis of the average salary of an equivalent expert engaged by the Agency and the applicable daily subsistence allowance as established by TAB, plus the cost of a round-trip air ticket;
- (b) Equipment. The value of equipment is estimated according to information received from the donor Government; and
- (c) Fellowships. The value of Type II fellowships is estimated on the basis of the monthly stipend, either as proposed by the host country or as established currently by TAB, multiplied by the duration of the award in months. The estimated travel costs have been added if they were paid by the host country.

These values and the totals in which they are included must therefore be considered as approximations.

3. Special Fund activities and funds-in-trust arrangements

Although these are mentioned in the report as part of the Agency's technical assistance co-operation activities, none of the statistical tables include Special Fund activities nor projects carried out under funds-in-trust arrangements.

4. International Centre for Theoretical Physics

Nineteen fellowships were awarded to the Theoretical Physics Centre at a total cost of US \$58 400; however, only US \$35 000 were transferred from Operating Fund I to Operating Fund II to cover part of these costs. It is therefore not possible with regard to individual fellowships at the Centre to specify from what source they were financed.

5. Types of assistance

- (a) "Experts" include visiting professors and also the "expert services" element of various training courses; with regard to Table 7 it should be noted that under "International projects" experts' services on regional and inter-regional training courses are not sub-divided by region but included, with associated fellowships, under the heading "short-term training courses";
- (b) "Equipment" includes the equipment element of various training courses, and also storage charges in the case of the mobile radioisotope laboratories;

- (c) "Fellowships" include research fellowships. However, in the tables showing the distribution of fellowships by place of study (Table 3) and nationality (Table 7) the numbers indicated for countries do not include fellows participating in short-term training courses outside their countries or those holding short-term research grants, since their inclusion would substantially distort the statistics relating primarily to the holders of one-year fellowships; the numbers thus excluded appear separately at the end of the respective tables. It should, however, be pointed out that for financial purposes extensions of fellowships are treated as new awards; hence the number of fellowships awarded differs from the actual number of fellows studying at the various institutes. None of the tables include any reference to local participants in training courses.

6. International projects

The heading "International projects" refers to regional, inter-regional and other international projects such as NORA, NPY, etc.

In Table 8 expenditures for regional short-term courses are included under regional activities.

Of the 15 fellowships included under "International projects" for the Agency Laboratory in Austria, nine were for participation in a long-term special purpose training course, and six were normal Type I fellowships for which the Agency is considered host. Similarly, CERN is regarded as the host of one fellow studying at that organization.

7. Figures

Due to the rounding-off of monetary amounts to the nearest hundred or thousand dollars, the totals indicated in various tables may differ slightly.

A. TECHNICAL ASSISTANCE RESOURCES

Table 1

Resources available: 1958-1964

(in thousands of dollars)

Year	EPTA (1)	Agency ^{a/}		Sub-totals ^{a/}		Total ^{a/} (1) + (2) + (3)
		Monetary (2)	In kind ^{a/} (3)	Monetary (1) + (2)	Agency ^{a/} (2) + (3)	
1958	-	124	390	124	514	514
1959	304	875	531	1179	1406	1710
1960	639	1008	813	1647	1821	2460
1961	787	981	845	1768	1826	2613
1962	843	1146	698	1989	1844	2687
1963	1049	1230	554	2279	1784	2833
1964	1050	1115	708	2165	1823	2873
1958-1964	4672	6479	4539	11 151	11 018	15 690

^{a/} Estimated - see Introductory Note 2 to this Annex.

Table 2

Agency funds for technical assistance: 1958-1964

(in thousands of dollars)

Item	1958-1960	1961	1962	1963	1964	1958-64
Target for voluntary contributions to the General Fund	3250	1800	2000	2000	2000	11 050
Budgeted for technical assistance ^{a/}	2717	1361	1625	1799	1680	9182
Amount pledged	2304	1262	1380	1435	1311 ^{b/}	7692
Actually made available for technical assistance from the General Fund and Operating Fund II ^{a/}	2007	981	1146	1230	1115	6479

^{a/} The use of funds from voluntary contributions is not restricted to technical assistance activities only but also covers other operations of the Agency like the Monaco and Seibersdorf Laboratories, contributions to the Trieste Centre and certain research contracts.

^{b/} This does not include the additional pledge of \$41 400 made in 1965. This sum together with the US matching contribution brings the total up to \$1 394 000.

Table 3

Number of experts classified by nationality and
fellowships classified by place of study

	Number of experts			Number of fellowships				
	EPTA	Agency		EPTA	Agency		Total	
		Paid	Free		Type I	Type II		
Country programmes								
Argentina	3	1	-	4	1	-	5	6
Australia	2	-	-	2	1	2	-	3
Austria	6	8	-	14	-	-	2	2
Belgium	1	3	-	4	1	2	5	8
Brazil	-	-	-	-	-	-	2	2
Canada	3	2	-	5	-	2	-	2
Chile	-	-	-	-	-	1	-	1
China	-	1	-	1	-	-	-	-
Colombia	1	1	-	2	-	-	-	-
CSSR	4	3	-	7	-	-	3	3
Denmark	1	1	-	2	-	2	4	6
France	3	7	-	10	3	27	-	30
Germany, F.R.	3	6	-	9	1	6	-	7
Greece	-	1	-	1	-	-	-	-
Hungary	1	1	-	2	2	-	4	6
India	3	3	-	6	-	-	2	2
Iraq	-	1	-	1	-	-	-	-
Israel	2	1	-	3	-	3	7	10
Italy	-	1	-	1	2	-	19	21
Japan	5	-	-	5	3	3	10	16
Mexico	-	1	-	1	-	-	-	-
Netherlands	-	-	-	-	-	1	5	6
New Zealand	2	-	-	2	-	-	-	-
Norway	2	2	-	4	-	2	-	2
Poland	3	-	-	3	-	-	4	4
Romania	-	-	-	-	2	-	-	2
South Africa	-	1	-	1	-	-	-	-
Spain	1	-	-	1	-	-	1	1
Sweden	1	3	-	4	2	4	1	7
Switzerland	-	-	-	-	-	1	-	1
USSR	-	6	-	6	9	-	8	17
UAR	2	-	-	2	-	-	-	-
UK	17	17	1	35	14	30	-	44
USA	13	21	3	37	7	19	57	83
Yugoslavia	3	-	-	3	-	-	5	5
INTERNATIONAL PROJECTS								
Neutron Crystal Spectrometer, Philippines					-	4	-	4
CERN, Switzerland					-	1	-	1
IAEA, Austria					-	15	-	15
Theoretical Physics Centre					-	19	-	19
NORA Project, Norway					-	3	-	3
Uppsala International Seminar, Sweden					-	4	-	4
Short-term training courses ^{a/}					127	53	-	180
Research grantees ^{b/}					-	12	-	12
TOTAL	82	92	4	178	175	216	144	535^{c/}

a/ Nine regional and inter-regional courses were financed under EPTA and were held in Brazil, Ceylon, India, Israel, Japan, the Philippines, the UAR and IAEA Headquarters in Austria; two inter-regional courses were financed from the Agency's monetary resources and were held in Denmark and Poland.

b/ The holders of these research grants studied in 27 countries.

c/ The difference between the number of fellows (533) and the number of awards is due to the fact that two fellows were granted two fellowships each to two different countries.

B. ALLOCATIONS AND DISBURSEMENTS OF AGENCY MONETARY
RESOURCES FOR TECHNICAL ASSISTANCE: 1958-1964

Table 4

Status of allocations and schedule of disbursements for technical assistance activities
from the General Fund and Operating Fund II as at 31 December 1964

(in thousands of dollars)

Year of allocation	Monetary resources made available	Year of disbursement							Total cash disbursements (1958-64)	Unliquidated obligations	Unobligated earmarkings ^{b/}	Savings (deficit)
		1958	1959	1960	1961	1962	1963	1964				
1958	124	6	76	38	4	-	-	-	124	-	-	-
1959	875	-	100	366	152	30	18	9	675	-	-	200
1960	1008	-	-	248	468	195	46	23	980	4	-	24
1961	981	-	-	-	252	433	162	34	881	14	8	78
1962	1146	-	-	-	-	299	489	171	959	79	23	85
1963	1230	-	-	-	-	-	436	490	926	154	104	46
1964	1115	-	-	-	-	-	-	567 ^{a/}	567	538	184	(174)
TOTAL	6479	6	176	652	876	957	1151	1294	5112	789	319	259 ^{c/}

^{a/} Includes \$35 000 made available for fellowships to the Theoretical Physics Centre.

^{b/} For experts and equipment only.

^{c/} This total covers all technical assistance activities of the Agency and can be divided into savings on;

Experts and equipment	\$ 169 000; and
Fellowships and training	\$ 90 000.

C. DISTRIBUTION OF TECHNICAL ASSISTANCE

Table 5
Types of technical assistance: 1958-1964^{a/}
(in thousands of dollars)

YEAR Type of resource	Experts		Visiting professors		Equipment		Fellowships		Research fellowships		Training courses		Mobile radioisotope laboratories		TOTAL		Unliquidated obligations	TOTAL expenditures and unliquidated obligations	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%			
1958-1960																			
EPTA	204.8	41.8	3.0	0.6	34.7	7.1	247.7	50.5	-	-	-	-	-	-	490.2	100.0	-	490.2	
Agency monetary	124.8	15.0	68.4	8.2	43.9	5.3	526.9	63.2	8.6	1.0	23.0	2.7	38.5	4.6	834.1	100.0	3.8	837.9	
Agency in kind ^{b/}	13.1	0.7	-	-	192.0	11.1	1529.5	88.2	-	-	-	-	-	-	1 734.6	100.0	-	1 734.6	
TOTAL ^{b/}	342.7	11.2	71.4	2.3	270.6	8.8	2304.1	75.3	8.6	0.3	23.0	0.8	38.5	1.3	3 058.9	100.0	3.8	3 062.7	
1961																			
EPTA	254.5	48.3	5.6	1.1	81.8	15.5	145.4	27.6	-	-	37.2	7.1	2.2	0.4	526.7	100.0	-	526.7	
Agency monetary	186.1	21.5	84.1	9.6	73.9	8.4	440.5	50.2	24.3	2.8	44.0	5.0	21.6	2.5	876.5	100.0	13.8	890.3	
Agency in kind ^{b/}	16.0	1.9	-	-	80.0	9.5	749.0	88.6	-	-	-	-	-	-	845.0	100.0	-	845.0	
TOTAL ^{b/}	458.6	20.4	89.7	4.0	235.7	10.5	1334.9	59.4	24.3	1.1	81.2	3.6	23.8	1.0	2 248.2	100.0	13.8	2 262.0	
1962																			
EPTA	348.3	50.2	66.9	9.6	90.7	13.1	134.8	19.4	-	-	53.2	7.7	-	-	693.9	100.0	-	693.9	
Agency monetary	306.0	32.0	99.7	10.4	130.1	13.6	336.5	35.2	21.1	2.2	43.0	4.5	20.2	2.1	956.6	100.0	78.8	1 035.4	
Agency in kind ^{b/}	19.7	2.8	-	-	197.5	28.3	480.6	68.9	-	-	-	-	-	-	697.8	100.0	-	697.8	
TOTAL ^{b/}	674.0	28.7	166.6	7.1	418.3	17.8	951.9	40.5	21.1	0.9	96.2	4.1	20.2	0.9	2 348.3	100.0	78.8	2 427.1	
1963																			
EPTA	213.7	29.8	6.7	0.9	146.6	20.4	227.7	31.8	-	-	122.3	17.1	-	-	717.0	100.0	58.7	775.7	
Agency monetary	359.4	31.2	121.3	10.5	200.8	17.5	355.2	30.9	19.5	1.7	78.5	6.8	16.4	1.4	1 151.1	100.0	153.6	1 304.7	
Agency in kind ^{b/}	32.4	5.8	-	-	1.0	0.2	521.0	94.0	-	-	-	-	-	-	554.4	100.0	-	554.4	
TOTAL ^{b/}	605.5	25.0	128.0	5.3	348.4	14.4	1103.9	45.5	19.5	0.8	200.8	8.3	16.4	0.7	2 422.5	100.0	212.3	2 634.8	
1964																			
EPTA	306.9 ^{c/}	27.5	52.3	4.7	265.1	23.7	170.5	15.2	-	-	323.1	28.9	-	-	1 117.9	100.0	411.9	1 529.8	
Agency monetary	424.7 ^{c/}	32.8	79.6	6.1	283.2	21.9	393.3	30.4	11.8	0.9	97.9	7.6	3.7	0.3	1 294.2	100.0	538.1	1 832.3	
Agency in kind ^{b/}	13.6	1.9	-	-	71.0	10.0	621.1	87.8	-	-	2.1	0.3	-	-	707.8	100.0	-	707.8	
TOTAL ^{b/}	745.2 ^{c/}	23.9	131.9	4.2	619.3	19.8	1184.9	38.0	11.8	0.4	423.1	13.6	3.7 ^{d/}	0.1	3 119.9	100.0	950.0	4 069.9	
1958-1964																			
EPTA	1328.2	37.5	134.5	3.8	618.9	17.4	926.1	26.1	-	-	535.8	15.1	2.2	0.1	3 545.7	100.0	470.6	4 016.3	
Agency monetary	1403.0	27.4	453.1	8.9	731.9	14.3	2052.4	40.1	85.3	1.7	286.4	5.6	100.4	2.0	5 112.5	100.0	788.1	5 900.6	
Agency in kind ^{b/}	94.8	2.1	-	-	541.5	11.9	3901.2	85.9	-	-	2.1	0.1	-	-	4 539.6	100.0	-	4 539.6	
GRAND TOTAL ^{b/}	2826.0	21.4	587.6	4.5	1892.3	14.3	6879.7	52.1	85.3	0.6	824.3	6.3	102.6	0.8	13 197.8	100.0	1258.7	14 456.5	

a/ Data as at 31 December 1964.

b/ Estimated - see introductory note 2 to this Annex.

c/ The 1964 figures for "Experts" include miscellaneous and bank charges amounting to 3.6 thousands of dollars under "EPTA" and 4.1 under "Agency monetary".

d/ Storage costs for mobile radioisotope laboratories.

Table 6

Fields of activity of technical assistance: 1964

Field	Number of experts	Value of equipment (in thousands of dollars)	Number of fellowships ^{c/}
General atomic energy development	2	18.2	9
Nuclear science ^{a/}	33	177.3	135
Prospecting, mining and processing of nuclear raw materials	12	58.2	22
Nuclear technology ^{b/}	34	51.7	129
Application of isotopes and radiation	79	385.5	204
Health, safety and waste disposal	18	18.9	34
TOTAL	178	709.8	533

a/ "Nuclear science" includes both physics and chemistry.

b/ "Nuclear technology" includes fuel fabrication and processing, reactor technology and nuclear electronics.

c/ These figures include 180 participants in 11 regional and inter-regional training courses and 12 holders of research grants.

Table 7

Recipients of experts and fellowship awards

Number of experts classified by place of assignment and fellowships
classified by nationality of the recipient: 1964

RECIPIENT	Number of experts								Number of fellowships							
	EPTA		Agency				Total		EPTA		Agency				Total	
	Num-ber	Man-months	Paid		Free		Num-ber	Man-months	Num-ber	Man-months	Type I		Type II		Num-ber	Man-months
			Num-ber	Man-months	Num-ber	Man-months					Num-ber	Man-months	Num-ber	Man-months		
<u>Country programmes</u>																
Afghanistan	-	-	1	22	-	-	1	22	-	-	-	-	1	72	1	72
Argentina	4	18	3	15	-	-	7	33	-	-	6	70	5	44	11	114
Austria	-	-	1	1	-	-	1	1	-	-	2	11	4	23	6	34
Bolivia	-	-	2	9	-	-	2	9	-	-	2	30	-	-	2	30
Brazil	1	11	7	36	-	-	8	47	1	3	2	24	1	6	4	33
Bulgaria	-	-	-	-	-	-	-	-	-	-	4	33	4	29	8	62
Burma	2	11	1	6	-	-	3	17	-	-	-	-	3	27	3	27
Cambodia	-	-	1	11	-	-	1	11	-	-	-	-	-	-	-	-
Ceylon	1	8	2	9	-	-	3	17	-	-	-	-	-	-	-	-
Chile	1	4	4	18	-	-	5	22	-	-	1	9	-	-	1	9
China	3	15	-	-	-	-	3	15	-	-	4	39	5	50	9	89
Colombia	2	2	3	16	-	-	5	18	-	-	2	20	1	12	3	32
Congo, D. R.	-	-	3	3	-	-	3	3	-	-	-	-	-	-	-	-
CSSR	-	-	-	-	-	-	-	-	-	-	4	45	4	36	8	81
Denmark	-	-	-	-	-	-	-	-	-	-	1	9	-	-	1	9
Ecuador	-	-	-	-	-	-	-	-	1	4	1	18	3	33	5	55
El Salvador	-	-	-	-	-	-	-	-	-	-	-	-	2	16	2	16
Ethiopia	-	-	-	-	-	-	-	-	-	-	-	-	1	60	1	60
Germany, F. R.	-	-	-	-	-	-	-	-	-	-	1	9	-	-	1	9
Ghana	1	6	2	19	-	-	3	25	1	7	3	27	8	118	12	152
Greece	5	27	6	8	2	4	13	39	2	18	5	45	6	62	13	125
Guatemala	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-	-	-	-	3	30	4	32	7	62
India	-	-	-	-	-	-	-	-	3	36	3	24	7	73	13	133
Indonesia	3	17	2	7	-	-	5	24	4	22	3	42	6	66	13	130
Iran	2	13	2	10	-	-	4	23	-	-	4	39	8	96	12	135
Iraq	1	5	1	12	-	-	2	17	1	6	4	39	5	60	10	105
Israel	1	12	1	5	-	-	2	17	-	-	1	6	2	24	3	30
Ivory Coast	-	-	-	-	-	-	-	-	-	-	1	12	-	-	1	12
Japan	-	-	-	-	1	2	1	2	-	-	8	87	1	12	9	99
Kenya	-	-	3	2	-	-	3	2	-	-	-	-	-	-	-	-
Korea, R.	-	-	4	30	-	-	4	30	2	22	6	78	5	53	13	153
Lebanon	-	-	2	11	-	-	2	11	-	-	1	12	-	-	1	12
Mali	-	-	-	-	-	-	-	-	-	-	1	8	-	-	1	8
Mexico	3	16	2	4	-	-	5	20	-	-	4	43	2	24	6	67
Morocco	2	4	1	8	-	-	3	12	-	-	6	70	1	12	7	82
Netherlands	-	-	-	-	-	-	-	-	-	-	1	9	1	12	2	21
New Zealand	-	-	-	-	-	-	-	-	-	-	2	22	-	-	2	22
Nicaragua	-	-	-	-	-	-	-	-	-	-	1	12	-	-	1	12
Nigeria	-	-	1	3	-	-	1	3	-	-	-	-	3	216	3	216
Pakistan	2	13	2	5	-	-	4	18	-	-	6	52	5	57	11	109
Paraguay	-	-	-	-	-	-	-	-	-	-	1	18	-	-	1	18
Peru	1	8	-	-	-	-	1	8	1	12	-	-	-	-	1	12
Philippines	4	22	1	5	-	-	5	27	2	24	3	42	9	101	14	167
Poland	-	-	-	-	-	-	-	-	1	12	9	95	3	30	13	137
Portugal	-	-	4	10	-	-	4	10	-	-	4	48	-	-	4	48
Rhodesia	1	1	1	1	-	-	2	2	-	-	-	-	-	-	-	-
Romania	-	-	1	1	-	-	1	1	-	-	3	29	3	28	6	57
Senegal	-	-	-	-	-	-	-	-	1	12	-	-	-	-	1	12
South Africa	-	-	-	-	-	-	-	-	-	-	1	12	2	18	3	30
Spain	-	-	-	-	-	-	-	-	-	-	2	18	1	8	3	26
Sudan	1	1	-	-	-	-	1	1	2	18	1	6	-	-	3	24
Syria	-	-	-	-	-	-	-	-	-	-	1	12	-	-	1	12
Thailand	2	11	3	7	-	-	5	18	2	24	5	52	6	69	13	145
Tunisia	1	3	5	12	-	-	6	15	1	12	8	75	1	60	10	147
Turkey	1	3	5	20	-	-	6	23	6	66	5	50	6	60	17	176
Uganda	1	6	-	-	-	-	1	6	-	-	-	-	-	-	-	-
UAR	2	3	5	13	-	-	7	16	6	51	4	36	8	88	18	175
Uruguay	-	-	-	-	-	-	-	-	-	-	-	-	1	6	1	6
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	2	24	2	24
Viet-Nam	-	-	1	11	-	-	1	11	-	-	-	-	1	10	1	10
Yugoslavia	1	3	1	6	-	-	2	9	11	112	9	93	3	26	23	231
TOTAL	49	243	85	357	3	6	137	606	48	461	149	1560	144	1853	341	3874

RECIPIENT	Number of experts								Number of fellowships							
	EPTA		Agency				Total		EPTA		Agency				Total	
	Num- ber	Man months	Paid		Free		Num- ber	Man months	Num- ber	Man months	Type I		Type II		Num- ber	Man months
			Num- ber	Man months	Num- ber	Man months					Num- ber	Man months	Num- ber	Man months		
INTERNATIONAL PROJECTS																
Asia and Far East	1	9	-	-	-	-	1	9	-	-	-	-	-	-	-	-
Inter-regional	1	9	-	-	-	-	1	9	-	-	-	-	-	-	-	-
Short-term training courses	31	42	10	5	1	1	42	48	127	330	53	78	-	-	180	408
Research grantees	-	-	-	-	-	-	-	-	-	-	12	22	-	-	12	22
TOTAL	33	60	10	5	1	1	44	66	127	330	65	100	-	-	192	430
GRAND TOTAL	82	303	95	362	4	7	181 ^{a/}	672	175	791	214	1660	144	1853	533	4304

a/ The difference between the number of assignments and the actual number of experts (178) is due to the fact that three experts were each assigned to two different countries.

Table 8

Financial summary: 1964

(in thousands of dollars)

RECIPIENT	Experts ^{a/}	Equip- ment ^{a/}	Fellow- ships ^{a/}	TOTAL ^{a/}	EPTA	Expenditures		TOTAL ^{a/}	Unliquidated obligations at 31 December 1964	TOTAL ^{a/} / Expenditures and unliquidated obligations
						Agency Monetary	In kind ^{a/}			
<u>Country programmes</u>										
Afghanistan	16.1	9.0	9.0	34.1	3.8	21.3	9.0	34.1	5.0	39.1
Argentina	39.9	34.4	46.7	121.0	40.7	65.4	14.9	121.0	89.4	210.4
Austria	1.4	-	5.0	6.4	-	1.9	4.5	6.4	1.4	7.8
Bolivia	11.7	-	7.3	19.0	-	19.0	-	19.0	17.3	36.3
Brazil	69.6	10.4	19.9	99.9	32.7	66.3	0.9	99.9	86.5	186.4
Bulgaria	-	-	28.5	28.5	-	23.2	5.3	28.5	20.2	48.7
Burma	23.3	14.6	9.7	47.6	30.8	7.1	9.7	47.6	28.2	75.8
Cambodia	12.3	5.7	-	18.0	-	18.0	-	18.0	1.7	19.7
Ceylon	31.5	5.5	-	37.0	16.5	20.5	-	37.0	22.0	59.0
Chile	32.8	15.4	4.6	52.8	16.0	36.8	-	52.8	14.3	67.1
China	25.0	13.4	25.3	63.7	33.6	11.6	18.5	63.7	21.9	85.6
Colombia	29.0	21.8	20.8	71.6	19.3	45.3	7.0	71.6	10.7	82.3
Congo, D.R.	6.1	14.1	-	20.2	-	20.2	-	20.2	5.9	26.1
Cuba	-	-	2.9	2.9	-	2.9	-	2.9	-	2.9
CSSR	-	-	20.5	20.5	-	13.4	7.1	20.5	17.8	38.3
Ecuador	-	20.0	12.7	32.7	1.9	4.5	26.3	32.7	6.0	38.7
El Salvador	-	-	2.9	2.9	0.3	0.6	2.0	2.9	-	2.9
Ethiopia	-	-	18.0	18.0	-	-	18.0	18.0	-	18.0
Ghana	35.7	-	37.3	73.0	7.8	34.7	30.5	73.0	12.6	85.6
Greece	56.4	5.2	37.9	99.5	50.6	19.3	29.6	99.5	25.3	124.8
Guatemala	0.9	16.6	4.1	21.6	4.1	17.5	-	21.6	-	21.6
Hungary	-	-	16.7	16.7	-	10.3	6.4	16.7	19.0	35.7
Iceland	0.4	13.3	-	13.7	-	13.7	-	13.7	0.1	13.8
India	2.3	2.3	92.6	97.2	42.0	12.0	43.2	97.2	56.4	153.6
Indonesia	34.0	4.2	51.8	90.0	37.8	21.3	30.9	90.0	31.3	121.3
Iran	38.5	-	49.3	87.8	25.2	29.7	32.9	87.8	37.3	125.1
Iraq	22.7	8.0	49.3	80.0	24.7	20.3	35.0	80.0	15.7	95.7
Israel	22.8	29.1	16.1	68.0	16.4	37.6	14.0	68.0	10.4	78.4
Italy	-	-	4.5	4.5	-	4.5	-	4.5	3.6	8.1
Ivory Coast	-	-	-	-	-	-	-	-	2.9	2.9
Japan	3.1	-	14.0	17.1	3.1	8.9	5.1	17.1	26.9	44.0
Kenya	3.7	18.3	-	22.0	-	22.0	-	22.0	0.2	22.2
Korea, R.	40.8	6.9	45.4	93.1	8.5	60.6	24.0	93.1	40.3	133.4
Lebanon	13.8	4.2	1.4	19.4	-	19.4	-	19.4	3.6	23.0
Mali	-	-	-	-	-	-	-	-	2.4	2.4
Mexico	28.0	48.0	19.0	95.0	40.4	24.6	30.0	95.0	15.9	110.9
Morocco	16.1	20.2	25.9	62.2	10.7	24.5	27.0	62.2	11.6	73.8
Netherlands	-	-	1.0	1.0	-	-	1.0	1.0	-	1.0
New Zealand	-	-	2.7	2.7	-	2.7	-	2.7	7.0	9.7
Nicaragua	-	-	1.6	1.6	-	1.6	-	1.6	3.0	4.6
Nigeria	4.0	15.0	27.0	46.0	-	4.0	42.0	46.0	0.8	46.8
Pakistan	25.5	31.3	44.3	101.1	20.5	51.1	29.5	101.1	33.7	134.8
Paraguay	0.1	-	4.6	4.7	-	4.7	-	4.7	2.2	6.9
Peru	11.4	5.0	1.3	17.7	16.7	1.0	-	17.7	9.4	27.1
Philippines	37.8	20.9	73.9	132.6	58.4	26.4	47.8	132.6	32.7	165.3
Poland	-	46.6	50.5	97.1	52.5	37.3	7.3	97.1	49.0	146.1
Portugal	14.4	-	7.1	21.5	-	20.6	0.9	21.5	11.2	32.7
Rhodesia	1.0	17.5	-	18.5	18.5	-	-	18.5	2.0	20.5
Romania	1.2	-	13.1	14.3	-	7.5	6.8	14.3	8.7	23.0
Saudi Arabia	-	-	1.2	1.2	-	1.2	-	1.2	2.2	3.4

RECIPIENT	Experts ^{a/}	Equip- ment ^{a/}	Fellow- ships ^{a/}	TOTAL ^{a/}	Expenditures			TOTAL ^{a/}	Unliquidated obligations at 31 December 1964	TOTAL ^{a/} Expenditures and unliquidated obligations
					EPTA	Agency				
						Monetary	In kind ^{a/}			
Senegal	-	1.9	0.5	2.4	2.4	-	-	2.4	15.1	17.5
South Africa	-	-	6.9	6.9	-	2.7	4.2	6.9	3.1	10.0
Spain	-	-	4.0	4.0	-	2.4	1.6	4.0	4.7	8.7
Sudan	1.4	3.9	5.8	11.1	2.3	8.8	-	11.1	10.3	21.4
Syria	-	-	-	-	-	-	-	-	2.9	2.9
Thailand	50.8	19.8	66.1	136.7	34.4	65.8	36.5	136.7	72.8	209.5
Tunisia	21.0	12.6	35.2	68.8	11.0	38.6	19.2	68.8	34.0	102.8
Turkey	31.6	10.0	35.1	76.7	10.8	44.3	21.6	76.7	49.5	126.2
Uganda	7.4	11.6	2.6	21.6	21.6	-	-	21.6	1.0	22.6
UAR	21.1	49.1	49.3	119.5	34.4	48.4	36.7	119.5	100.9	220.4
Uruguay	-	-	0.9	0.9	-	-	0.9	0.9	-	0.9
Venezuela	-	-	10.7	10.7	-	1.9	8.8	10.7	3.0	13.7
Viet-Nam	13.6	0.2	5.7	19.5	3.1	13.8	2.6	19.5	4.7	24.2
Yugoslavia	9.2	33.3	46.5	89.0	37.7	44.8	6.5	89.0	73.2	162.2
TOTAL	869.4	619.3	1196.7	2685.4	791.2	1188.5	705.7	2685.4	1200.9	3886.3
INTERNATIONAL PROJECTS										
Americas	4.7	7.6	7.7	20.0	19.4	-	0.6	20.0	0.8	20.8
Asia and Far East	8.9	21.3	14.1	44.3	44.3	-	-	44.3	5.2	49.5
Europe	0.6	1.5	0.1	2.2	2.2	-	-	2.2	-	2.2
Inter-regional projects	99.8	56.4	165.4	321.6	257.2	62.9	1.5	321.6	50.4	372.0
Theoretical Physics Centre	-	-	35.0	35.0	-	35.0	-	35.0	-	35.0
TOTAL	114.0	86.8	222.3	423.1	323.1	97.9	2.1	423.1	56.4	479.5
Miscellaneous										
Bank charges	7.7	-	-	7.7	3.6	4.1	-	7.7	-	7.7
Mobile labora- tories storage	-	3.7	-	3.7	-	3.7	-	3.7	1.4	5.1
GRAND TOTAL	991.1	709.8	1419.0	3119.9	1117.9	1294.2	707.8	3119.9	1258.7	4378.6

^{a/} Estimated - see introductory note 2 to this Annex.

Recipient	Number of years in programme	Experts ^{a/}	Equip ^{a/} ment	Fellow ^{a/} ships	Total ^{a/}	Expenditures			Total ^{a/}	Unliquidated obligations at 31 December 1964	Total ^{a/} expenditures and unliquidated obligations
						EPTA	Agency				
							Monetary	In kind ^{a/}			
Pakistan	7	186.6	127.1	201.4	515.1	159.2	221.0	134.9	515.1	33.7	548.8
Paraguay	5	10.3	4.6	18.6	33.5	-	29.1	4.4	33.5	2.2	35.7
Peru	6	11.5	5.0	33.0	49.5	30.1	1.0	18.4	49.5	9.4	58.9
Philippines	6	118.9	136.9	265.2	521.0	221.9	131.4	167.7	521.0	32.7	553.7
Poland	7	-	46.6	319.1	365.7	56.8	185.5	123.4	365.7	49.0	414.7
Portugal	4	28.3	46.0	22.0	96.3	-	39.0	57.3	96.3	11.2	107.5
Rhodesia	2	1.0	17.5	5.4	23.9	23.9	-	-	23.9	2.0	25.9
Romania	5	1.2	-	81.7	82.9	-	29.0	53.9	82.9	8.7	91.6
Saudi Arabia	2	-	-	22.7	22.7	-	1.2	21.5	22.7	2.2	24.9
Senegal	4	4.6	29.9	3.4	37.9	37.9	-	-	37.9	15.1	53.0
South Africa	6	-	-	98.1	98.1	-	38.0	60.1	98.1	3.1	101.2
Spain	7	-	-	39.9	39.9	-	16.1	23.8	39.9	4.7	44.6
Sudan	4	8.8	16.3	12.2	37.3	6.7	30.6	-	37.3	10.3	47.6
Sweden	1	-	-	8.8	8.8	-	8.8	-	8.8	-	8.8
Switzerland	5	-	-	12.1	12.1	-	5.6	6.5	12.1	-	12.1
Syria	1	-	-	-	-	-	-	-	-	2.9	2.9
Thailand	7	284.1	44.9	308.1	637.1	216.5	267.2	153.4	637.1	72.8	709.9
Tunisia	5	64.4	39.8	56.3	160.5	43.4	79.2	37.9	160.5	34.0	194.5
Turkey	7	209.1	109.6	228.9	547.6	103.7	261.9	182.0	547.6	49.5	597.1
Uganda	3	10.2	14.4	5.3	29.9	29.9	-	-	29.9	1.0	30.9
UAR	7	96.2	124.3	343.6	564.1	62.8	232.3	269.0	564.1	100.9	665.0
USA	1	-	-	2.6	2.6	-	2.6	-	2.6	-	2.6
Uruguay	2	-	2.2	7.6	9.8	8.0	-	1.8	9.8	-	9.8
Venezuela	6	21.7	30.7	86.4	138.8	14.0	63.4	61.4	138.8	3.0	141.8
Viet-Nam	5	13.6	24.2	26.6	64.4	9.5	33.8	21.1	64.4	4.7	69.1
Yugoslavia	7	50.3	52.3	413.0	515.6	186.8	197.3	131.5	515.6	73.2	588.8
TOTAL		3 394.8	1 991.2	6 965.0	12 351.0	3 005.7	4 807.8	4 537.5	12 351.0	1 200.9	13 551.9
INTERNATIONAL PROJECTS											
Africa		17.2	19.5	3.0	39.7	39.7	-	-	39.7	-	39.7
Americas		10.2	18.8	18.6	47.6	47.0	-	0.6	47.6	0.8	48.4
Asia and the Far East		27.9	29.0	14.1	71.0	69.5	-	1.5	71.0	5.2	76.2
Europe		21.0	18.6	17.3	56.9	56.9	-	-	56.9	-	56.9
Middle East		5.8	1.2	5.3	12.3	12.3	-	-	12.3	-	12.3
Inter-regional projects		149.2	67.4	345.2	561.8	310.4	251.4	-	561.8	50.4	612.2
Theoretical Physics Centre		-	-	35.0	35.0	-	35.0	-	35.0	-	35.0
TOTAL		231.3	154.5	438.5	824.3	535.8	286.4	2.1^{b/}	824.3	56.4	880.7
Miscellaneous											
Bank charges		18.8	-	-	18.8	4.2	14.6	-	18.8	-	18.8
Mobile laboratories storage		-	3.7	-	3.7	-	3.7	-	3.7	1.4	5.1
GRAND TOTAL		3 644.9	2 149.4	7 403.5	13 197.8	3 545.7	5 112.5	4 539.6	13 197.8	1 258.7	14 456.5

a/ Estimated - see introductory note 2 to this Annex.

b/ No estimate can be made of the values of contributions in kind to International projects for previous years.

A N N E X II

REGIONAL AND INTER-REGIONAL TRAINING COURSES: 1964

EPTA

- | | | | |
|----|--|-----------------------------------|-------------------------|
| 1. | Inter-regional training course on the maintenance and repair of nuclear electronic equipment | 13 January-
30 June 1964 | Colombo,
Ceylon |
| 2. | Advanced inter-regional training course on the cellular and molecular aspects of radiobiology | 20 April-
6 June 1964 | Rehovoth,
Israel |
| 3. | Inter-regional training course on the application of radioisotopes in engineering, chemistry, biology and agriculture | 17 August-
24 December 1964 | Tokyo,
Japan |
| 4. | Inter-regional training course on the applications of radioisotopes in medicine | 19 October-
11 December 1964 | Manila,
Philippines |
| 5. | Inter-regional training course on the use of research reactors for the production of radioisotopes and activation analysis | 26 October-
18 December 1964 | Bombay,
India |
| 6. | Inter-regional training course on the use of isotopes in agricultural biochemistry | 28 October-
23 December 1964 | Seibersdorf,
Austria |
| 7. | Regional training course on the application of radioactive isotopes in soil-plant relations | 22 September-
13 November 1964 | Piracicaba,
Brazil |
| 8. | Special training course in medicine | 7 March-
30 April 1964 | Cairo,
UAR |
| 9. | Second general training course in radioisotope techniques | 17 September-
5 November 1964 | Cairo,
UAR |

Regular Programme

- | | | | |
|-----|---|-----------------------------|------------------------|
| 10. | IAEA/UNESCO refresher course on nuclear physics for university teaching staff in developing countries | 4 May-
18 September 1964 | Copenhagen,
Denmark |
| 11. | International advanced summer school on reactor physics | 14-29 September
1964 | Zakopane,
Poland |

