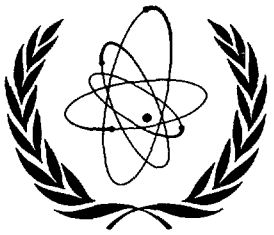

International Atomic Energy Agency

ANNUAL REPORT OF THE BOARD OF GOVERNORS TO THE GENERAL CONFERENCE

1 July 1961 - 30 June 1962

GC(VI)/195

Printed by the
International Atomic Energy Agency
in Austria - July 1962

TABLE OF CONTENTS

ANNEXES

LIST OF ABBREVIATIONS

ACABQ	Advisory Committee on Administrative and Budgetary Questions
ACC	Administrative Committee on Co-ordination
Agency	International Atomic Energy Agency
ECAFE	Economic Commission for Asia and the Far East of the United Nations
ECE	Economic Commission for Europe of the United Nations
ECLA	Economic Commission for Latin America of the United Nations
ECOSOC	Economic and Social Council of the United Nations
ENEA	European Nuclear Energy Agency of the Organisation for Economic Co-operation and Development
EPTA	United Nations Expanded Programme of Technical Assistance
FAO	Food and Agriculture Organization of the United Nations
IANEC	Inter-American Nuclear Energy Commission of the Organization of American States
ICRP	International Commission on Radiation Protection
ICRU	International Commission on Radiological Units and Measurements
ICSU	International Council of Scientific Unions
IMCO	Intergovernmental Maritime Consultative Organization
OECD	Organisation for Economic Co-operation and Development
OEEC	Organisation for European Economic Co-operation
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
WHO	World Health Organization
WMO	World Meteorological Organization

NOTE

All sums of money are expressed in United States dollars.

INTRODUCTION

1. In this document the Board presents its report on the fifth year of the Agency's work.[1]

2. The character of the Agency's programmes remained much the same in 1961 as in 1960 but there were some changes in their scope. Technical assistance activities, particularly training, decreased in 1961 mainly because voluntary contributions again failed to meet the target set. The number of scientific meetings has remained at about 12 a year. There was some growth in the research contract programme, the Laboratory at Seibersdorf came into operation and Member States are now beginning to make substantial use of its services. In 1961, for the first time, Member States asked for the Agency's help in planning individual power reactor projects. It is expected that a number of nuclear power plants will come into operation in the developing areas in the late 1960s and this will require a good deal of preparatory work in the next few years. In May 1962 the Special Fund approved for the first time a project for the peaceful uses of atomic energy; this decision may provide an important new source of finance for certain types of nuclear science projects in the developing countries.

3. During these first five years the Agency has set up considerable scientific and administrative machinery. The ways in which this can be most economically and effectively used to meet the needs of the Agency's Member States, particularly in the developing areas, is now being studied by the Board and the Director General pursuant to the request made by the General Conference at its fifth regular session for the initiation of a long-term programme for the activities of the Agency.[2] In making this request the General Conference drew attention to the difficulties experienced in financing the Agency's operational programme. As has been noted above, these difficulties continued in 1961; the present indications are that they will also seriously curtail the Agency's operational programme in 1962.

4. The membership of the Agency has increased from 75 to 77. Mali became a Member on 10 August 1961 and the Congo (Léopoldville) on 10 October 1961.

5. On 1 December 1961 Mr. Sigvard Eklund assumed office as Director General of the Agency in succession to Mr. Sterling Cole.

---

[1] For previous reports see documents GC(II)/39, GC(III)/73, GC(IV)/114 and GC(V)/154.

[2] See Resolution GC(V)/RES/105.

CHAPTER I. PLANNING AND ADMINISTRATION

1. The Board

6. The fourth Board held its last two meetings in September 1961, and the fifth Board met for the first time on 9 October 1961. On that occasion it elected Mr. B.H. Hasani (Iraq) Chairman, and Mr. I.H. Usmani (Pakistan) and Mr. L. Janossy (Hungary) Vice-Chairmen. The composition of both the fourth and fifth Boards, and of their committees, is given in Annex I.

7. The fifth Board has adopted a pattern of meetings slightly different from that of its predecessors. After its first two meetings in October 1961, it did not meet again until the end of February 1962, when it held ten meetings; thereafter it met in June (ten meetings) and plans to meet briefly in mid-July and again in September immediately before the General Conference. The fifth Board thus held 22 meetings during the period covered by this report. During this period ten committee meetings were also held.

8. In the light of the amendment to Article VI.A.3 of the Statute approved by the General Conference [3] in October 1961, and pending its entry into force, the fifth Board considered it desirable to invite two Members of the Agency from the area of Africa and the Middle East to participate in its work with the same rights as Members of the Board, to the extent that the Statute permitted. As a sequel to this invitation Ghana and Tunisia have been represented at meetings of the Board since 28 February 1962.

9. As of 30 June 1962 twenty-one Member States have accepted the aforementioned amendment of the Statute. A total of 52 acceptances will be required to bring the amendment into force.

2. The Scientific Advisory Committee

10. The Scientific Advisory Committee held its seventh meeting in Vienna on 4 October 1961 and its eighth meeting on 7 and 8 June 1962.

3. External relations

11. Since his appointment the Director General has visited France, Mexico, Norway and the United States of America for formal or informal discussions with the authorities responsible for relations with the Agency, as well as the Secretary-General and senior officers of the United Nations, the International Bank for Reconstruction and Development and IANEC.

12. By the end of June 1962 forty-one States had established permanent missions to the Agency, their number having increased by nine in the period under review. A list of Resident Representatives is given in Annex II.

(a) The United Nations

13. On 23 November 1961, the former Director General orally presented the Agency's annual report to the General Assembly for the year 1960-61 [4]. At the conclusion of the debate in which 11 representatives took part, the General Assembly adopted Resolution 1651 (XVI) taking note of the report. Other resolutions adopted by the General Assembly of interest to the Agency have been brought to the attention of the Board, and the Agency is co-operating, where appropriate, in their implementation. Among these is Resolution 1629 II (XVI) which invited WMO, in consultation with the Agency and UNSCEAR, to examine the feasibility of expanding the present meteorological reporting system to include measurements of atmospheric radioactivity.

---

[3] See Resolution GC(V)/RES/92.

[4] Documents GC(V)/154 and INFCIRC/31.

14. As authorized by the General Conference [5], the Board has submitted an annual report to ECOSOC [6] covering the period 1 April 1961 to 31 March 1962.

15. Technical reports have continued to be submitted to UNSCEAR and Agency representatives have participated in the deliberations of the Committee.

16. Technical co-operation with the regional economic commissions has continued; the Agency is giving advice or contributing studies on hydrology (ECAFE) and nuclear power (ECAFE, ECE and ECLA), and participating in the meetings of the commissions themselves and of committees convened by them.

(b) EPTA and the Special Fund

17. The end of the first year of the biennial period (1961-62) has provided the Agency with an opportunity to review its programme financed through EPTA and to make, in agreement with the Governments concerned, a number of adjustments which will increase the effectiveness of the programme as a whole.

18. The Governing Council of the Special Fund, at its meetings held in May 1962, approved a project on nuclear research and training in agriculture in Yugoslavia, and has invited the Agency to act as Executing Agency. This is the first such project to be undertaken.

(c) Participation in the work of ACC

19. The former Director General represented the Agency at the thirty-third session of ACC, held in October 1961, and the Director General attended the session held in May 1962. The Agency also participated in all meetings of ACC's Preparatory Committee.

(d) The specialized agencies

20. The programmes of the Agency and of certain of the specialized agencies - notably WHO and FAO - in subjects of mutual interest are continuing to increase. Standing inter-secretariat working groups with these two organizations have therefore been established, and it appears that this new machinery will provide a useful means of aligning programmes and effecting economies.

(e) Intergovernmental organizations

21. In conformity with the relationship agreements with ENEA [7] and IANEC, the work of the Agency, particularly that concerning regulatory activities, is continuing to be co-ordinated with the work of these organizations.

(f) Non-governmental organizations

22. The number of non-governmental organizations to which the Agency has granted consultative status remains at 19.[8]

---

[5] See Resolution GC(V)/RES/90.

[6] INFCIRC/35.

[7] In November 1961 the Director General was informed by the Secretary-General of OECD that, at its first meeting held on 30 September 1961, the Council of OECD confirmed the decision adopted by the Council of OEEC on 28 July 1960, approving the Agreement for Co-operation between the Agency and ENEA.

[8] See document GC(V)/154, paragraph 35 and Annex IV.

4. Administration

(a) Personnel

23. On 30 June 1962 the staff of the Agency was composed of 232 staff members in the Professional category and above, and 317 in the General Service category. The number of nationalities represented among that section of staff which is subject to geographic distribution was 43.

(b) Finance

24. The budget for 1962 was reviewed by ACABQ whose report was noted by the General Assembly at its sixteenth regular session.

I. Regular programme

The financial year 1961

(i) Assessments

25. The total assessed contributions for 1961 of Member States included in the scale of assessment for that year amounted to $6 168 000. With the addition of Colombia, Congo (Léopoldville), Ghana, Lebanon, Mali and Senegal as Members of the Agency, total assessments for 1961 were increased to $6 200 690. The percentages for which these new Member States have been assessed are as follows:

Member State	Percentage
Colombia	0.29
Congo (Léopoldville)	0.04
Ghana	0.06
Lebanon	0.05
Mali	0.04
Senegal	0.05

(ii) Receipts

26. By 31 December 1961 the Agency had received contributions towards the Regular Budget for 1961 amounting to $5 554 021, representing 89.57% of the total contributions due for that year. By 30 June 1962 the total received rose to $5 684 813 or 91.68% of the total contributions due for 1961.[9]

(iii) Expenditure

27. Expenditure during the financial year 1961, including unliquidated obligations, amounted to $6 030 557, which left a budgetary surplus of $315 319, made up as follows:

Budgetary savings	$137 443
Miscellaneous income (including $32 690 assessments on new Member States)	$177 876
Budgetary surplus for 1961	$315 319

[9] See Annex III, which shows outstanding contributions to the 1958, 1959, 1960 and 1961 Regular Budgets.

28. While the budgetary surplus for 1961 was $315 319, contributions outstanding for the same year amounted to $646 669, leaving a provisional cash deficit of $331 350.

29. Unliquidated obligations as at 31 December 1961 were $1 029 362, of which $463 828 had been liquidated by 30 June 1962.

(iv) Transfers between sections of the 1961 Budget

30. In the course of implementing the 1961 programme it became apparent that a serious shortage of funds existed in respect of the Agency's publications programme. This shortage could be attributed to the growth of the Agency's programme of scientific conferences and meetings which resulted in an increase in the publications of conference proceedings for distribution to Member States and the scientific community in general. On the other hand, the appropriation for special missions in 1961 was based on plans for a larger programme of missions than was finally required. In October 1961, the Board accordingly approved the Director General's request to transfer $34 000 from Section 4: Special missions of the Regular Budget to Section 6: Distribution of information.

The financial year 1962

(i) Assessments

31. Five of the six Member States that joined the Agency too late for inclusion in the 1961 scale, e.g. Colombia, Ghana, Lebanon, Mali and Senegal, were included in the scale of contributions for 1962 which was approved by the General Conference at its fifth regular session [10]. Consequently, the percentage assessments of several Member States were reduced slightly as compared with their 1961 percentages. These reductions had the effect of slightly reducing the advances to the Working Capital Fund for which these States were assessed and the differences were deducted from their outstanding budgetary contributions.

32. Similar deductions were made from the outstanding contributions of Member States in respect of their shares in the 1959 cash surplus.

33. The assessment towards the Regular Budget for 1962 of the Congo (Léopoldville) which joined the Agency too late for inclusion in the 1962 scale is $2464 or 0.04%.

(ii) Receipts

34. By 30 June 1962 advances to the Working Capital Fund and contributions to the Regular Budget for 1962 had been received as follows:

Advances to the Working Capital Fund	$1 992 400
Contributions to the 1962 Regular Budget	$2 440 771

By that date Member States had thus paid 99.58% of the total advances due to the Working Capital Fund and 39.60% of the total contributions due to the 1962 Regular Budget [11].

(iii) Supplementary budget estimates

35. In March 1962 the Board approved an increase in salaries and other emoluments for the Agency's staff which requires a supplementary appropriation of $470 600 to provide for the increased administrative expenses of the Agency during the current year. [12]

---

[10] See Resolution GC(V)/RES/110.

[11] See Annexes IV and V.

[12] See document GC(VI)/191.

II. Operational programme

General Fund for 1961

(i) Pledges and receipts

36. Of a total amount of $1 261 200 pledged to the General Fund for 1961, $1 100 257 had been paid by 31 December 1961. By 30 June 1962 a further amount of $147 726 had been received, leaving a balance of $13 217 still to be paid.

37. As compared with the target of $1 800 000 set for 1961 by the General Conference at its fourth regular session, there was a shortfall of approximately $540 000 in the actual pledges made by Member States.[13]

(ii) Expenditure

38. Operational expenditure during 1961 amounted to $1 669 993. Unliquidated obligations as at 31 December 1961, including obligations brought forward from previous years, amounted to $1 269 157.

General Fund for 1962

39. The total amount pledged to the General Fund for 1962 as at 30 June 1962 was $1 277 142 of which $442 833 had been paid by that date.[14]

Use of the balance in the General Fund

40. In June 1962, the Board considered the question of a transfer of part of the balance in the General Fund to the reserve in terms of Financial Regulation 6.13. It decided that the balance in the General Fund should be reduced to $150 000 by the end of 1963.[15]

III. Special Account

41. During 1962, a special account was established in the amount of 40 000 roubles provided by the Union of Soviet Socialist Republics for use on fellowships. This gift was accepted by the Board in February 1962 under the Rules to Govern the Acceptance of Gifts of Services, Equipment and Facilities.[16]

(c) Legal matters

42. The majority of the legal work done during the period under review has been connected with the Agency's technical activities and is reflected in Chapter II of this report.

43. Six further instruments of acceptance of the Agreement on the Privileges and Immunities of the Agency [17], have been deposited with the Director General; by 30 June 1962 eleven States had become parties to the Agreement.

---

[13] See Annex VI, part B.

[14] See Annex VI, part A.

[15] See document GC(VI)/INF/49.

[16] INFCIRC/13, part I.

[17] INFCIRC/9/Rev.1.

CHAPTER II. SCIENTIFIC AND TECHNICAL WORK

1. Nuclear power, reactors, fuels and materials

44. During the year there has been an increase in the interest of Member States in undertaking or studying the possibilities of undertaking nuclear power projects with the Agency's help. At the same time the Agency has received indications of the problems faced by a number of Member States in making full use of research reactors that have recently come into operation or that will shortly do so. In approaching these problems, the Board and Secretariat have been guided by Resolutions GC(V)/RES/106 and 109 adopted by the General Conference at its fifth regular session.

(a) Power reactors

45. In June 1961 an Agency mission made a preliminary survey of the possibility of establishing a demonstration power reactor in Yugoslavia, which might be designed, built and operated as an international enterprise. The mission's preliminary assessments of the technical aspects of the project were favourable. Another mission visited Pakistan in January 1962 to evaluate the prospects of nuclear power in that country and to review a study prepared on the subject by the Pakistan Atomic Energy Commission and its engineering consultants. The work of a third mission undertaken in 1960 [18] has since been published in a report on the prospects of nuclear power in the Philippines [19], which shows that a 200 MW nuclear power plant, coming into operation in 1967-68 in the Manila area, might be economically competitive with an oil-fired station of the same size. It must be stressed, however, that some projects referred to are still at an early stage and that many problems, particularly of financing the projects internationally, have yet to be considered. A report is being submitted to the General Conference in a separate document.

46. A general review of nuclear power costs [20], a report on the methods of determining generating costs [21], and a summary of information on small power reactors being built in the United States of America [22] were issued in the latter part of 1961. The Agency also contributed survey papers on nuclear power costs and regional power problems to two technical seminars organized respectively by ECLA in Mexico City in July 1961, and by ECAFE in Bangkok in December 1961.

(b) Problems in using research reactors

47. It is estimated that there are at present over 200 research reactors in operation or being constructed throughout the world, 25 of which are in developing countries. Many reactor centres are experiencing difficulties in finding scientific and technical personnel to make full use of the reactors, operate them safely and plan programmes for reactor experiments. In one case, for example, it was necessary to shut down a reactor temporarily. The Agency is endeavouring to help overcome these difficulties through its training and technical assistance programme.

---

[18] See document GC(V)/154, paragraph 73.

[19] Prospects of Nuclear Power in the Philippines, Agency publication No. STI/DOC/10/3.

[20] Document GC(V)/INF/38.

[21] Introduction to the Methods of Estimating Nuclear Power Generating Costs, Agency publication No. STI/DOC/10/5.

[22] Document GC(V)/INF/41.

48. A Symposium on the Programming and Utilization of Research Reactors, which was organized by the Agency in Vienna in October 1961, was concerned with problems encountered in the use of research reactors. The symposium stimulated much interest in arranging direct co-operation between well established and new centres and showed a need for a number of smaller meetings to discuss the subject in greater detail.

(c) Nuclear physics and reactor research

49. The Agency has continued to promote advanced nuclear research by collecting and publishing information and arranging scientific meetings. It has also arranged for scientists from both developing and technically advanced countries to undertake advanced reactor physics research through participation in the NORA research project, which is being organized jointly by the Agency and the Norwegian Government [23].

50. At the Symposium on Radiation Damage in Solids and Reactor Materials, held in Venice, Italy, in May 1962, useful information for reactor design was presented, additional applications of radiation damage were suggested and new experimental techniques were discussed. The symposium also showed the need for clearer and more direct experiments before a satisfactory understanding of the basic mechanism of radiation damage can be achieved.

51. In June 1962 a Conference on the Corrosion of Reactor Materials was held in Salzburg, Austria. Discussions reflected interest in corrosion problems, the solution of which might ultimately lead to increased performance in reactor operation, cheaper fuel cycle costs and more economic nuclear power.

52. In addition to the symposia referred to in paragraphs 48 and 50 above, four scientific meetings on various types of nuclear physics and reactor research were held during the reporting period. One of them, a Conference on Plasma Physics and Controlled Nuclear Fusion Research, held in Salzburg, Austria, in September 1961, attracted wide interest, and many eminent scientists numbered among the 473 participants. One hundred and nine papers were presented (31 each from the Soviet Union and the United States, 14 from the United Kingdom of Great Britain and Northern Ireland, 12 from the Federal Republic of Germany and 11 from France), which covered all aspects of the programmes now being undertaken for the eventual development of useful energy from controlled nuclear power. The participants recommended that a similar conference should be held in 1964.

53. The other three specialized meetings were organized in Vienna. In August 1961 a Seminar on the Physics of Fast and Intermediate Reactors was held, which promoted useful discussions on the most recent data pertaining to fast neutron reactors. A Symposium on Power Reactor Experiments, in October 1961, dealt mainly with reactor concepts still at an experimental stage, and a Symposium on the Thermodynamics of Nuclear Materials, held in Vienna in May 1962. As a sequel to the latter symposium, a panel will be convened in October 1962 to assess the thermodynamic data of carbides of uranium and plutonium.

54. With the advice of a panel of experts, which was convened in December 1961, a special study is being made of the ways in which the Agency can supplement and co-operate in the work already being undertaken by various scientific groups for international co-ordination of nuclear measurements and for the critical analysis and compilation of all types of nuclear data. Another panel was convened in June 1962 with the more specific task of reviewing the physics of light water moderated lattices.

---

[23] It will be recalled that the zero power reactor facility NORA, which first reached criticality on 29 June 1961, has been made available by the Norwegian Government for use in the research programme, and the United States Government is providing one of the fuel charges for the reactor. For the texts of the relevant agreements, see documents INFCIRC/29 and Add. 1.

(d) Reactor fuels and equipment

55. The Agency's programme under this heading has continued to be modest. Three new projects for the supply of reactors and fuel were approved in the period under review, namely for the transfer of two AGN 211 P-type training reactors and their fuel from the United States to various institutions in Yugoslavia, and of a 5 MW pool-type reactor and fuel from the United States to Pakistan. Member States have also offered to supply further quantities of source and fissionable materials to the Agency, usually at current market prices. A project was also approved for the transfer from Belgium to the Congo (Léopoldville) of title to the fuel in the 50 kW Triga Mark I research reactor at Lovanium University in Léopoldville, and for the supply of additional fuel from the United States for the continued operation of the reactor. [24]

56. At a Consultants Meeting on Tropicalization of Instruments, held in December 1961 in Vienna, a document on technical specifications when ordering nuclear electronic instruments for use in tropical countries was discussed. This document describes tropical climatic conditions and their effects on equipment, handling shocks during transit, main supply voltage requirements of various countries "severity conditions" and special Agency requirements. It is also concerned with standards of design, materials, electronic components, construction and design, marking drawings and descriptive literature, testing, packing, guarantees, and information to be supplied with the tender and after tests.

2. Radioisotopes and radiation

57. The number of uses of radioisotopes and radiation has continued to increase and the Agency has continued to give special attention, in co-operation with the specialized agencies concerned, to promoting their medical and agricultural applications in the developing countries. Work has also begun in the Agency's Laboratory and work in the field has continued on the study of various hydrological problems. Scientific research and the exchange of information have been promoted by a number of scientific meetings, the award of research contracts and preparation of reviews.

(a) Medicine

58. As previously noted [25], the first practical application of atomic energy in many developing countries is the medical use of isotopes in diagnosis, therapy or research. Much of the Agency's technical assistance programme is therefore concerned with this subject. In 1961 forty-two fellowships were granted, experts on medical applications were working in ten developing Member States, and medical research under contracts awarded from Agency funds was undertaken in six Member States of which five were in the developing areas [26]. The research programme on the production and use of the isotope calcium-47, which is of particular medical importance, has continued. Special attention is now being paid to research on tropical or sub-tropical diseases, on which WHO has been asked to give advice. Regional training courses on the medical applications of radioisotopes were organized in the United Arab Republic in November/December 1961 and in Greece in May/June 1962. Eighteen students attended the former and 20 the latter course.

---

[24] For the text of the relevant agreements see document INFCIRC/37.

[25] See document GC(V)/154, paragraph 95.

[26] Two further contracts for research on medical applications - health physics, application of radioisotopes in medicine - were awarded from funds made available by the United States Government.

59. A Conference on the Use of Radioisotopes in Animal Biology and the Medical Sciences was held jointly by the Agency, FAO and WHO in Mexico City in November/December 1961 which served as a complement to the Conference on the Use of Radioisotopes in the Physical Sciences and Industry, organized jointly by the Agency and UNESCO in Copenhagen in September 1960. Sixty-one papers were presented, which dealt with isotope applications in the study of glandular functions, mineral metabolism, lactation, ruminant metabolism, general physiology and the use of isotopes in clinical studies.

60. Meetings of consultants in September and December 1961 reviewed procedures for distributing information on therapeutic dose distributions with high-energy radiation and discussed various factors influencing the gamma radiation output of teletherapy sources. In January and February 1962 a special isotope mission visited institutes in Greece, Iran, Iraq, Sudan, Turkey and the United Arab Republic to study and give advice on problems encountered in planning, establishing and operating teletherapy units. The mission was accompanied by the regional adviser of WHO on radiotherapy.

61. The Agency is also trying to promote internationally the standardization and calibration of measurements of radioiodine concentration in the thyroid gland, as one of the most widespread clinical uses of radioiodine is in diagnosing and treating disorders of the thyroid.

(b) Agriculture

62. The Agency's technical assistance and research programmes on the agricultural uses of isotopes and radiation have grown in variety and scope during the past year. In 1962, a regional research contract programme was initiated on the efficiency of fertilizer application in rice-growing areas of the world, involving the participation of institutes in Burma, Hungary, Pakistan, the Philippines, Thailand, the United Arab Republic and the Agency's Laboratory.

63. In 1961, fellowships were awarded to 31 scientists in agricultural applications of isotopes. A second international training course was jointly held by the Agency and FAO in September/October 1961 in Wageningen, the Netherlands, [27] where participants were trained to use radioisotope techniques in the study of the relations between soil and plant in agricultural and forestry research.

64. Agency experts were working in eight developing Member States in 1961, and five contracts were awarded from Agency funds in that year [28] for research in agricultural applications of isotopes in four Member States. Studies are being undertaken mainly on:

(i) The relationship between types of soil, fertilizers and plant growth;

(ii) The control of insect pests and other entomological problems;

(iii) The improvement of crop production, for instance, by developing new varieties of crops;

(iv) Animal diseases and animal physiology;

(v) Methods of improving milk and meat production; and

(vi) The development of practical methods of using radiation to preserve sterilized foodstuffs.

65. Most of this research is taking place under the guidance of special panels of experts, in which FAO has participated. These panels have been convened to review the extent to which isotope techniques can be used in solving special agricultural problems: one is

---

[27] See document GC(V)/154, paragraph 112.

[28] One further contract for research in agricultural applications of isotopes was awarded from funds made available by the United States Government.

studying the agricultural problems of Africa, another those of rice-growing areas and a third the possibility of using radiation for grain disinfestation. In addition, a small study group was convened in Vienna in April 1962 to consider applications of selected radiation combination processes for preserving high protein foods, with particular emphasis on research applicable to the needs of the developing countries.

66. Three scientific meetings in the period under review dealt with agriculture. The first was held in October 1961 in Brussels, when the Agency joined FAO and WHO in sponsoring a Technical Meeting on the Evaluation of the Wholesomeness of Irradiated Foods. It was recommended that the three organizations establish joint machinery to promote further work on this subject, in particular by means of experiments on animals to test the wholesomeness of food preserved by radiation. The second, a Conference on the Use of Radioisotopes in Animal Biology and the Medical Sciences has been referred to in paragraph 59 above.

67. The third was a Symposium on the Use of Radioisotopes in Soil-Plant Nutrition Studies, organized jointly by the Agency and FAO in Bombay in February/March 1962. The symposium reviewed the use of new isotope techniques for studying such questions as soil chemistry and physics, the synthesis and disintegration of organic matter in soil, and the absorption of fertilizers by plants.

(c) Industry

68. Most of the industrial techniques for using isotopes and radiation, such as thickness gauging, leak detection, measurement of the flow of liquids, oil well logging, radiography, production control, are well-developed commercial applications rather than matters for scientific research, and the main work of the Agency has been to continue the two industrial surveys reported last year. [29] The first, a systematic survey of radioisotope applications in industry, has been completed, and the second, an international survey of industrial savings achieved by using radioisotopes, is still at a preliminary stage.

(d) Hydrology

69. The world-wide survey of the concentration of hydrogen and oxygen isotopes in rain waters [30], undertaken in collaboration with WMO has been continued. Consideration is also being given to making a similar survey of these isotopes in river water. Hydrological studies of ground water resources by means of tracers are being undertaken in Greece as previously reported [30] and in the vicinity of Trieste on the Italian-Yugoslav frontier, and their possible use in water resources development in East and West Pakistan is being investigated. Plans have also been submitted to the Committee for the Co-ordination of Investigation of the Lower Mekong Basin for using radioisotopes to trace sand and silt movements in the Tonle Sap - Great Lake region of Cambodia.

(e) Radiation standards

70. In January 1962, the Agency's Laboratory at Seibersdorf began to distribute, at the rate of one a month, calibrated radioactive solutions of the following 12 different nuclides: P^{32}, I^{131}, Au^{198}, Ce^{144}, Na^{22}, Co^{60}, Sr^{90} (+Y^{90}), Sr^{89}, Fe^{59}, S^{35}, Ba^{140} and Cs^{137}. This service will enable laboratories, hospitals and clinics using radionuclides for medical, biological and industrial uses to calibrate their measuring instruments. More than 750 requests have been received for 1962 from some 70 institutions in 31 Member States.

---

[29] See document GC(V)/154, paragraphs 116 and 117.

[30] Ibid., paragraph 128.

71. The Agency has continued to co-operate with the International Bureau of Weights and Measures in developing and improving methods of measuring absolute activity by inter-laboratory comparisons of various nuclides, and has also co-operated with laboratories in Belgium, the Czechoslovak Socialist Republic, the Federal Republic of Germany, Hungary, Poland and Romania in improving calibration methods and in checking the radiochemical purity of some important radioactive products, such as P^{32} and I^{131}.

3. Protection against radiation

72. The relatively rapid growth in the number of facilities, such as nuclear power and research reactors, hospitals, etc., where radiation hazards may arise, and increasing international concern about the effects of all types of ionizing radiation have continued to make protection against radiation hazards one of the Agency's main concerns. During the past year its work on this subject has ranged from support of research on the effects of radiation to the preparation of international conventions on the legal aspects of nuclear incidents.

73. Plans are also being worked out for co-operation with WMO and UNSCEAR under Resolution 1629 II (XVI) of the General Assembly of the United Nations for establishing a world-wide system for reporting measurements of radioactivity in the atmosphere.

(a) Research on radiation effects

74. The Agency's research programme on this subject is being guided by a study group of leading radiobiologists at which WHO and UNESCO are also represented. During 1961 research was in progress under 27 contracts from Agency funds in institutions in 14 Member States [31]. The main subjects of research include the mechanism of radiation damage to cells and at the sub-cellular level, means of increasing or changing natural resistance to radiation and the preservation of drugs and biosynthetic products by radiation.

75. The training and technical assistance given under this heading included an advanced international training course on the biological effects of radiation, held near Rehovoth in Israel from October 1961 to February 1962, which was attended by 20 students, and an international course on radiation health and safety held in Chiba City, Japan, in October/November 1961, attended by 20 students. In 1961, thirty-five fellowships in health physics were awarded.

76. The Agency contributed substantially to two other meetings dealing with research on radiation effects. It co-sponsored one section of the Fifth International Biochemistry Congress held in Moscow in August 1961, which dealt with the effect of radiation on biochemical processes. The second meeting was a Symposium on Cellular Basis and Aetiology of Late Somatic Effects of Ionizing Radiations, held jointly by UNESCO and the Agency in London in March 1962. This dealt with the effects of radiation in causing cancer and leukaemia, shortening the life span, and with the effectiveness of protective measures against delayed somatic damage.

77. The Agency is co-operating with Finnish, Norwegian and Swedish experts and the Finnish Government in investigating the effects of high concentrations of radioactive nuclides in the staple diet of certain parts of the population of Scandinavia.

78. The report on the dosimetry experiment carried out at Vinča, Yugoslavia, in April 1960 [32] was published in February 1962. [33]

---

[31] Four further contracts for research on radiobiology were awarded from funds made available by the United States Government.

[32] See document GC(IV)/114, paragraphs 174 and 175.

[33] Agency publication No. STI/DOC/10/6.

(b) Research on the safe disposal of radioactive wastes in the environment

79. Countries beginning programmes using atomic energy for peaceful purposes must make arrangements to dispose of radioactive waste from isotope laboratories and research reactors. Research under Agency contracts on this subject, which is in progress in nine countries has, therefore, been designed primarily to find cheap ways of treating such waste and to ascertain the effects of small releases of waste into the environment.

80. Under the Agency's special three-year research programme in Monaco, studies are being made with the help of the Oceanographic Institute in Monaco on subjects such as the movement of radionuclides and their concentrates in organisms as well as their effects upon the organisms. Similar research is being supported in other Mediterranean countries and joint projects for research and training in oceanography are being prepared in consultation with the interested specialized agencies in the ACC Sub-Committee on Oceanography.

(c) Radiation protection services

81. Special radiation protection guidance and services are now being provided in many forms. The Laboratory carried out environmental contamination studies at the request of four Governments and completed and submitted to UNSCEAR a survey on strontium-90 and caesium-137 in food consumed in Austria. In view of the interest shown by Member States in the work of the environmental radioactivity section of the Laboratory, a summary of its activities is attached as Annex VII. The Agency's staff has also advised the Sudan and the United Arab Republic on setting up equipment for measuring environmental radioactivity.

82. In December 1961, a Seminar on the Agricultural and Public Health Aspects of Radioactive Contamination in Normal and Emergency Situations was arranged jointly by FAO, WHO and the Agency in Scheveningen in the Netherlands. Agricultural and public health authorities were given guidance on the means of assessing and dealing with contamination problems.

83. Work is also progressing on making arrangements for emergency assistance to be given to any country in which a nuclear accident may occur. An inter-secretariat working group, at which ILO, FAO, WHO, ENEA and the League of Red Cross Societies were represented, met at the Agency's headquarters in Vienna in April 1962 to review information collected so far by the Agency's Secretariat.

(d) Reactor safety

84. In February 1962, the second health and safety inspection of the reactor NORA, referred to in paragraph 49 above, was carried out by Agency staff members, the initial inspection having been made when the reactor first reached criticality. A group of experts was also sent, at the request of the Governments, to evaluate the safety of research reactors being constructed in Finland, the Philippines and Thailand.

85. In May 1962 a Symposium on Reactor Safety and Hazards Evaluation Techniques was held in Vienna. Some 70 papers were presented which dealt with more realistic appraisals of hazards and greater safety, based on improved design, improved organization of operating staff and better operating techniques.

(e) Regulatory and legal work

(i) Basic safety standards

86. The Agency's draft basic safety standards [34] were further reviewed by a panel of experts, and comments of Member States and international organizations were taken

---

[34] See document GC(V)/154, paragraph 116.

into account. The draft standards, as modified, were considered by the Board in June 1962 and approved as a first edition which will be periodically revised. These basic standards are intended to apply to operations undertaken or supported by the Agency and to serve as a basis for national regulations on radiation protection.

(ii) Transport regulations

87. The Agency's Regulations for the Safe Transport of Radioactive Materials, [35] published in May 1961, have since been incorporated by the United Nations Committee of Experts for Further Work on the Transport of Dangerous Goods in its recommendations to ECOSOC. They have also been extensively incorporated in the International Regulations Concerning the Carriage of Dangerous Goods (RID) [36], which came into force on 1 June 1962 and taken into account by the Customs Co-operation Council. The latter body, with the co-operation of the Agency is preparing a classification of nuclear products for customs purposes. The Agency is co-operating with ECE in the revision of the European Agreement concerning the International Carriage of Dangerous Goods by Road. Draft regulations for the transport of radioactive materials on the Rhine were prepared by the Central Commission for the Navigation of the Rhine with the assistance of the Agency. These draft regulations were presented to ECE jointly by the Commission and the Agency as a draft proposal for the relevant part of the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.

(iii) Guides and codes of practice

88. A revised version of the Agency's manual on Safe Handling of Radioisotopes was issued [37] which incorporates the latest recommendations of ICRP and extracts from the report of Committee II of ICRP on permissible dose for internal radiation. In addition a manual on the use of film badges for personnel monitoring was issued and work continued on the preparation of a manual on the design of safe radioisotope laboratories and a directory of existing whole body monitors.

(iv) Control of waste disposal

89. Under the guidance of various panels of experts, regulatory work has continued on the following projects:

(a) Problems of disposal of radioactive waste into fresh water;

(b) A manual on the safe disposal of radioactive waste for users of radioisotopes;

(c) International measures - organizational, administrative and legal - that might be taken concerning the disposal of radioactive waste into the sea; and

(d) Methods of treating radioactive wastes before storage instead of discharging them into the environment.

(v) Civil liability

90. As previously reported, the draft International Convention on Minimum International Standards Regarding Civil Liability for Nuclear Damage was revised by an intergovernmental committee in Vienna in May 1961. [38] In March 1962 the Board authorized

---

[35] Agency publication No. STI/PUB/40.

[36] These Regulations constitute Annex I of the International Convention Concerning the Carriage of Goods by Rail (CIM).

[37] Agency publication No. STI/PUB/1/Rev.1.

[38] See document GC(V)/154, paragraphs 171 and 172.

the Director General to convene an International Conference on Civil Liability for Nuclear Damage early in 1963, on the understanding that the intergovernmental committee would be re-convened before that date in order to review the text of the draft convention to be submitted to the Conference.

91. The ad hoc session of the Diplomatic Conference on Maritime Law, held in Brussels from 14 to 25 May 1962 and co-sponsored by the Belgian Government and the Agency, completed a Convention on the Liability of Operators of Nuclear Ships, [39] which was adopted by 28 votes to ten with four abstentions. The Convention was opened for signature on 25 May and was signed on that day by 12 States, including eight Members of the Agency.

[39] Ibid., paragraphs 173 and 174.

CHAPTER III. PROGRAMMES AND ACTIVITIES

1. Technical assistance

(a) Resources

92. The Agency's technical assistance programme has continued to rely on three types of resources:

(i) Voluntary financial contributions to the Agency's General Fund;

(ii) Funds allocated to the Agency through EPTA; and

(iii) Fellowships, equipment and the services of experts provided completely or partially free of charge by Member States.

93. Resources available for technical assistance activities of the Agency in the last three years are shown in Table I below:

Table I

Source	1959	1960	1961
	$	$	$
Monetary resources			
Funds available from the Agency's own resources (General Fund)	798 408	1 044 702	1 015 691
Financial authorizations from EPTA[a/]	304 580	639 362	808 614
TOTAL	1 102 988	1 684 064	1 824 305
Resources in kind			
Estimated value of cost-free fellowships	561 500	807 000	748 771
Estimated value of gifts of equipment	-	192 000	110 000
Experts	b/	b/	b/

a/ Includes normal earmarkings, re-allocations to cover previous year contractual commitments and Working Capital and Reserve Fund authorizations as revised at the end of each year.

b/ The services of experts have been provided free of charge by various Member States, the value of which is not normally estimated by the Governments concerned.

94. Table I above shows that funds available from the Agency's own resources, which are provided from voluntary contributions to the General Fund, are the largest single source for financing the Agency's technical assistance programme. Contributions to the General Fund have, however, consistently failed to reach the targets set by successive sessions of the General Conference, as is shown in Table II below.

Table II

	1959	1960	1961
	$	$	$
Target for voluntary contributions	1 500 000	1 500 000	1 800 000
Amount pledged	1 183 044	996 103	1 261 750
Budgeted for technical assistance	1 100 000	1 367 000	1 361 000
Actually available for technical assistance	798 408	1 044 702	1 015 691

95. Demands on the programme have continued to grow rapidly and to exceed the resources available. The wide gap between pledges to the General Fund and the targets set has made it difficult even to carry out approved projects, although special contributions have alleviated this situation to some extent.

96. The funds allocated to the Agency for 1961/62 from EPTA amount to $1 500 769, of which $110 150 are set aside for regional projects, and $89 900 are being used by the Agency for its programme in Africa. In this latter connection the Agency has borne in mind the terms of ECOSOC Resolution 768 (XXX).

97. Technical assistance offered or provided in 1961 free or partially free of charge by individual Member States is shown in Annex VIII to this report. The Annex covers offers of fellowships and subsequent awards, numbers of experts provided and gifts of equipment.

98. As in previous years, the Agency has sent composite expert missions to Member States to prepare the way for technical assistance programmes; four countries in Africa and five in Latin America were visited by two such missions during 1961. Eight African countries and one in the Middle East have so far been visited in 1962.

99. A fuller report on the use of available resources for technical assistance activities in 1961 is given in a separate document.[40]

(b) Training

100. Under the 1961 programme 370 candidates were selected for fellowship awards, as compared with 468 in 1960. After subsequent withdrawals 344 fellowships were actually awarded in 1961. Under the 1962 programme 318 students had been selected for awards by 30 June 1962.

101. In addition, 11 research and special grants were made under the 1961 programme to enable advanced research workers to undertake research at leading nuclear centres or to make study tours. By 30 June 1962 two such grants had been made under the 1962 programme.

102. Under the 1961 programme, 19 visiting professors were sent to 11 Member States, compared with 17 visiting professors under the 1960 programme. By 30 June 1962 two had been assigned to institutions in Member States under the 1962 programme.

103. Seven regional or international training courses were held in 1961. Three of these - two in the United Arab Republic [41] and one in Israel [42] - were financed from EPTA funds; a course in Japan [42] was co-sponsored by WHO, and two courses in the Netherlands [43] were co-sponsored by FAO. With regard to 1962, one course, financed

[40] GC(VI)/INF/52.

[41] See document GC(V)/154, paragraph 196, and paragraph 58 above.

[42] See also paragraph 75 above.

[43] See document GC(V)/154, paragraph 196, and paragraph 63 above.

under EPTA, has so far been held in May/June in Greece [44] and a nine-month regional training course in nuclear metallurgy, co-sponsored by the Government of Argentina, IANEC and the Agency, began in Buenos Aires in March. Four further courses are at present planned for the latter part of the year.

104. A Regional Seminar for Latin America on Educational Problems of Nuclear Energy, organized jointly by the Agency, UNESCO and IANEC, in November 1961 in San Carlos de Bariloche, Argentina, was attended by 47 participants from 18 countries.

105. During 1961 and the first half of 1962, the Agency's two mobile radioisotope laboratories provided general instruction on radioisotope techniques in Argentina, Brazil, China (Taiwan), Indonesia, the Philippines, Uruguay and Viet-Nam.

(c) Provision of experts and equipment

106. During 1961, 109 technical assistance experts - including 19 visiting professors mentioned in paragraph 102 above and 12 experts provided by Governments free of charge - were working on Agency projects in Member States. The Agency continues to experience serious problems in recruiting qualified technical assistance experts, especially for long-term assignments in the field. Details of experts and equipment provided through the Agency are given in a separate report.[40]

2. Exchange of information

107. Attendance at the scientific conferences, seminars and symposia organized by the Agency in 1961 was practically the same as in 1960, e.g. some two thousand scientists attended 12 meetings. A list of such meetings organized in 1961 and scheduled for 1962 is given in Annex IX.

108. In accordance with Resolution GC(V)/RES/107, adopted by the General Conference at its fifth regular session, the Agency is studying the possibility of establishing an international centre for theoretical physics. Arrangements are being made to organize a seminar on theoretical physics in Trieste, Italy, in July/August 1962.

109. As in the past, scientific publications have comprised mainly reports on the proceedings of scientific meetings, recommendations, manuals on protection against radiation, and other technical material produced by the Secretariat. Two issues of the Agency's journal Nuclear Fusion: Journal of Plasma Physics and Thermonuclear Fusion were published during the period under review, and the first supplement on the proceedings of the Conference on Plasma Physics and Controlled Nuclear Fusion Research, held in Salzburg.[45] Six reviews prepared by leading scientists on various aspects of nuclear science were published in the Agency's Review Series, and three extensive bibliographies were published for general distribution. These and other scientific publications issued during the reporting period are listed in Annex X.

110. The Agency's library now contains some 54 000 acquisitions and has continued to provide bibliographic, reference, photo-copying and other services to Member States on request. The Agency is also preparing an educational film on the safe handling of radioisotopes in laboratories.

3. Research and development

111. Seventy-three research contracts - 26 new contracts and 47 renewals - to the value of $576 944 were financed from Agency funds in 1961, as compared with 69 - 42 new

---

[44] See also paragraph 58 above.

[45] See also paragraph 52 above.

contracts, 27 renewals - to the value of $502 577 in 1960. [46] The various types of research supported are mentioned under the relevant headings describing the scientific work of the Agency.

112. Tables III and IV below give breakdowns by subject matter and by country of the research contracts awarded or renewed which were financed from Agency funds and external resources in 1961.

Table III

Subject matter of research	Number of contracts placed	Number of contracts renewed	Contribution from Regular Budget	Contribution from Operational Budget	Contribution from external sources	Total
			$	$	$	$
Safe disposal of radioactive waste	4	8	72 960	-	16 174	89 134
Health physics and radiation protection	12	16	166 574	-	15 000	181 574
Radiobiology	1	17	109 735	-	36 970	146 705
Safeguards methods	2	1	69 320	-	-	69 320
Power reactor studies	5	1	50 190	-	54 000	104 190
Application of radioisotopes in agriculture	3	4	-	19 195	21 200	40 395
Application of radioisotopes in hydrology	1	-	2 400	-	-	2 400
Application of radioisotopes in medicine	4	4	48 420	38 150	11 100	97 670
Miscellaneous	1	-	-	-	2 900	2 900
TOTAL	33	51	519 599	57 345	157 344	734 288

[46] Additional contracts were awarded or renewed from funds made available by the United States Government: in 1960, ten such contracts to the value of $90 690 were awarded or renewed; in 1961, eleven to the value of $157 344; and a further five to the value of $58 860 during the first half of 1962.

Table IV

Country	Number of contracts placed	Number of contracts renewed	Contribution from Regular Budget	Contribution from Operational Budget	Contribution from external sources	Total
			$	$	$	$
Argentina	1	1	8 400	-	-	8 400
Australia	1	1	3 065	-	5 650	8 715
Austria	1	4	65 816	-	-	65 816
Belgium	2	2	22 325	-	-	22 325
Chile	-	1	14 400	-	-	14 400
China	1	-	-	5 455	-	5 455
Czechoslovak Socialist Republic	1	1	24 440	-	-	24 440
Finland	2	2	15 560	-	19 050	34 610
France	-	5	37 950	-	15 000	52 950
Germany, Federal Republic of	1	-	9 300	-	-	9 300
Greece	-	1	-	6 200	-	6 200
Hungary	1	1	11 800	-	-	11 800
India	1	1	23 830	-	-	23 830
Israel	2	2	47 740	10 200	-	57 940
Italy	2	2	14 400	-	16 174	30 574
Japan	1	5	17 130	8 740	-	25 870
Kenya	1	-	-	10 250	-	10 250
Netherlands	3	2	43 880	-	-	43 880
Norway	2	-	-	-	56 900	56 900
Philippines	-	1	-	8 900	-	8 900
Poland	1	2	18 170	-	-	18 170
Portugal	1	1	6 850	4 000	-	10 850
South Africa	-	1	4 080	-	-	4 080
Spain	1	1	23 580	-	-	23 580
Sweden	1	1	18 000	-	12 920	30 920
Switzerland	-	2	16 330	-	-	16 330
Thailand	-	1	-	2 600	-	2 600
United Kingdom of Great Britain and Northern Ireland	2	5	16 750	-	20 550	37 300
United States of America	-	2	20 450	-	-	20 450
Venezuela	1	-	-	-	11 100	11 100
Yugoslavia	3	3	35 353	1 000	-	36 353
TOTAL	33	51	519 599	57 345	157 344	734 288

113. A list of the titles of research contracts renewed, awarded and completed during 1961 is given in Annex XI, and references to publications reporting results of work under Agency research contracts are given in Annex XII. [47]

4. Safeguards

114. Provisions for the attachment and application of the Agency's safeguards were incorporated, after negotiations with the States concerned, in agreements subsequently approved by the Board for assistance by the Agency in obtaining two training reactors and the enriched fuel therefor for Yugoslavia[48], in obtaining a research reactor with enriched fuel for Pakistan[49], and in arranging for the transfer of title to fuel, as well as for the supply of additional enriched uranium, for a research reactor in the Congo (Léopoldville)[50].

115. The United States has invited the Agency to apply its safeguards for a limited period of time to four United States reactors to permit testing and development of the Agency's safeguards procedures. The Agency's safeguards system will be applied to reactor facilities of different types, namely the Brookhaven Graphite Research Reactor, the Brookhaven Medical Research Reactor, the Argonne Experimental Boiling Water Reactor and the Piqua Organic Moderated Reactor. The relevant agreement [51] was approved by the Board on 28 February 1962 and entered into force on 1 June 1962. The first inspection was carried out at the beginning of June.

116. Consultations with Japan and Canada and with Japan and the United States began with a view to formulating appropriate agreements for the transfer to the Agency of the administration of safeguards in connection with bilateral agreements between the Governments concerned for co-operation in the peaceful uses of atomic energy. The Agency was also informed of an agreement between the Governments of Japan and South Africa regarding the application of safeguards to source materials which may be transferred from South Africa to Japan.

117. Following the establishment of the amounts of source material which may be supplied to a State without the application of safeguards[52], the JRR-3 research reactor project for which three tons of natural uranium were supplied to Japan through the Agency under an agreement signed on 24 March 1959, was released from Agency safeguards on 2 March 1962[53].

118. The first safeguards inspection by the Agency was performed in February 1962 on the zero power reactor NORA and on fuel supplied for its operation[54]. On the basis of the information obtained during this inspection, the reactor was assessed by the Board as having a maximum power for continuous operation of less than 3 thermal MW and was consequently exempted from the attachment of safeguards. The Board, on the basis of the report on a safeguards inspection performed in April 1962, made a similar assessment of

---

[47] Summaries of results of a number of completed contracts have also been published by the Agency under the title IAEA Research Contracts, First Annual Report.

[48] See also paragraph 55 above.

[49] INFCIRC/34, part II, Annex A.

[50] See also paragraph 55 above. It was also decided that the reactor might be exempted, after an inspection, from the attachment of safeguards without further reference to the Board.

[51] INFCIRC/36.

[52] INFCIRC/26, paragraph 32(a)(i).

[53] INFCIRC/3/Mod. 2.

[54] See also paragraphs 49 and 84 above.

the Triga Mark II reactor at Otaniemi, Finland [55], which was thereupon exempted from the attachment of safeguards. Part of the fuel supplied for both reactors is still subject to the attachment of safeguards, and consequently safeguards will be applied to reactor facilities while they are using such fuel.

119. In June 1962 the Board considered the question of a general review of the principles and procedures for the attachment and application of the Agency's safeguards, and is submitting a separate report thereon to the General Conference [56], pursuant to Resolution GC(IV)/RES/71.

[55] INFCIRC/24 and Add. 1.

[56] GC(VI)/INF/48.

ANNEX I

THE BOARD OF GOVERNORS: 1961-1962

A. Member States and their Governors

Member State			Governor or Representative
To 6 October 1961	1961-1962	From 6 October 1961	(30 June 1962)
	Argentina[a]		Mr. O. A. Quihillalt
	Australia[b/f]		Mr. A. D. McKnight
Belgium[c]			
	Brazil[b/f]		Professor M. D. Souza Santos
Bulgaria[d]			
	Canada[b/f]		Miss B. M. Meagher
Ceylon[d]			
		Colombia[e]	Dr. T. A. Marulanda
		Czechoslovak Socialist Republic[g]	Mr. J. Fuksa
	El Salvador[a]		Mr. E. Suarez C.
Finland[c]			
	France[b/f]		Dr. B. Goldschmidt
	Germany, Federal Republic of[a]		Dr. W. Schulte-Meermann
		Ghana[h]	Mr. H. A. H. S. Grant
		Greece[e]	Mr. A. G. Spanides
		Hungary[e]	Professor L. Janossy (Vice-Chairman)
	India[b/f]		Mr. A. S. Lall
	Iraq[a]		Mr. B. H. Hasani (Chairman)
	Japan[b/f]		Mr. F. Uchida
Mexico[d]			
		Pakistan[e]	Dr. I. H. Usmani (Vice-Chairman)
Philippines[d]			
Poland[c]			
		Portugal[g]	Mr. A. A. Pinto de Lemos
	South Africa[b/f]		Mr. D. B. Sole
Spain[d]			
		Sweden[g]	Mr. H. A. B. Brynielsson

To 6 October 1961	Member State 1961-1962	From 6 October 1961	Governor or Representative (30 June 1962)
	Thailand[a]		Mr. M. M. Vejyant-Rangsrisht
		Tunisia[h]	Mr. B. Torki
	Union of Soviet Socialist Republics[b/f]		Professor V. S. Emelyanov
	United Kingdom of Great Britain and Northern Ireland[b/f]		Mr. M. I. Michaels
	United States of America[b/f]		Dr. H. D. Smyth
		Viet-Nam[e]	Professor Buu Hoi

a/ Elected by the General Conference on 30 September 1960 under Article VI. A. 3 and B of the Statute.

b/ Designated by the Board on 20 June 1960 under Article VI. A. 1 of the Statute.

c/ Designated by the Board on 20 June 1960 under Article VI. A. 2 of the Statute.

d/ Elected by the General Conference on 25 September 1959 under Article VI. A. 3 and B of the Statute.

e/ Elected by the General Conference on 5 October 1961 under Article VI. A. 3 and B of the Statute.

f/ Designated by the Board on 21 June 1961 under Article VI. A. 1 of the Statute.

g/ Designated by the Board on 21 June 1961 under Article VI. A. 2 of the Statute.

h/ Represented on the Board pursuant to a resolution adopted on 9 October 1961 whereby the Board requested the Chairman

> "to arrange, in consultation with Members of the Agency in the area of Africa and the Middle East, for two of their number, should they so desire, to be represented at meetings of the Board from the date of the adoption of the present resolution until the end of the sixth regular session of the General Conference, in order to participate in its work with the same rights as Members of the Board, to the extent that the Statute permits."

B. Committees

Note: Each Committee is presided over by the Chairman or, in his absence or disability, one of the Vice-Chairmen of the Board.

Title	Established	Composition	
		1 October 1960 to 6 October 1961	From 6 October 1961
Committee to Advise the Director General on Permanent Headquarters	20 March 1958	Argentina Brazil Bulgaria Canada India Spain	Argentina Canada Greece Hungary India
Committee on Agreements for the Supply of Fissionable, Source and Other Materials	3 July 1958	Brazil Canada India Iraq Japan Poland Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America	Brazil Canada Greece Hungary India Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America
Committee on Non-Governmental Organizations	15 January 1959	El Salvador France India Japan Poland Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America	Czechoslovak Socialist Republic El Salvador France Greece India Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America
Technical Assistance Committee	19 January 1959	Argentina Brazil Canada Finland France Germany, Federal Republic of India Iraq Japan	Argentina Brazil Canada Colombia Czechoslovak Socialist Republic France Hungary India Japan

Title	Established	Composition	
		1 October 1960 to 6 October 1961	From 6 October 1961
Technical Assistance Committee (*contd.*)		Mexico Philippines Poland Spain Thailand Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America	South Africa Sweden Thailand Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America Viet-Nam
Administrative and Budgetary Committee	19 January 1959	Brazil Canada France India Iraq Japan Poland South Africa Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America	Brazil Canada Czechoslovak Socialist Republic France Germany, Federal Republic of India Japan South Africa Union of Soviet Socialist Republics United Kingdom of Great Britain and Northern Ireland United States of America

ANNEX II

RESIDENT REPRESENTATIVES OF MEMBER STATES

State	Resident Representative
ARGENTINA[a/]	Mr. A.B. Estévez
BELGIUM	Mr. J. Errera
BRAZIL[a/]	Mr. F.B. Franco Netto
BULGARIA	Mr. I. Daskalov
CHILE	Mr. E. Fuenzalida Espinosa
COLOMBIA[a/]	Dr. E. Casas Manrique
CUBA	Mr. L.O. Rodriguez
CZECHOSLOVAK SOCIALIST REPUBLIC[a/]	Dr. K. Petrželka
DENMARK	Mr. S. Kristensen
EL SALVADOR[a/]	Dr. J. Contreras Chávez
FINLAND	Mr. O. Wartiovaara
GREECE[a/]	Mr. G. Christodulo
HOLY SEE	(Vacant)
HONDURAS	Mr. A. Englander
HUNGARY[a/]	Dr. K. Bárd
ICELAND	Mr. P. Eggerz
INDONESIA	Mr. A. Hadi
IRAN	Mr. M. Mir Fakhrai
ISRAEL	Mr. I. Keenan
ITALY	Mr. E. Martino
LEBANON	Mr. C. Ammoun
MEXICO	Mr. M. Cabrera Maciá
MONACO	Mr. H.P. Masmejean
NETHERLANDS	Mr. H.F. Eschauzier
NORWAY	Mr. T. Oftedal
PERU	Dr. M. Sosa Pardo de Zela
POLAND	Mr. W. Krawczyk
PORTUGAL[a/]	Mr. A. de Lucena
ROMANIA	Dr. V. Dimitriu
SOUTH AFRICA[a/]	Mr. J.G. Stewart
SPAIN	Mr. J.S. de Erice
SWEDEN[a/]	Mr. S. Allard

State	Resident Representative
SWITZERLAND	Mr. B. de Fischer
THAILAND[a/]	Mr. O. Vanikkul
TURKEY	Mr. B. V. Karatay
UNION OF SOVIET SOCIALIST REPUBLICS[a/]	[b/]
UNITED ARAB REPUBLIC	Mr. H. M. Tohamy
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND[a/]	Mr. J. McAdam Clark
UNITED STATES OF AMERICA[a/]	Mr. W. I. Cargo
VENEZUELA	Dr. M. Roche
YUGOSLAVIA	Mr. S. Nakičenović

Permanent Representative of the Secretary-General of the United Nations to the IAEA

Mr. A. Dollinger

---

a/ This State is also a Member of the Board of Governors during the year 1961-62.

b/ An Acting Resident Representative has been in charge of the Permanent Mission since November 1961.

ANNEX III

OUTSTANDING CONTRIBUTIONS TO THE 1958, 1959, 1960 AND 1961 REGULAR BUDGETS

Member	1958	1959	1960	1961	Total
	$	$	$	$	$
ARGENTINA	-	-	44 111	63 530	107 641
BRAZIL	-	-	-	34 926	34 926
CHILE	-	-	14 608	15 420	30 028
CHINA	-	-	221 818	286 195	508 013
COLOMBIA	-	-	-	17 887	17 887
CONGO (LEOPOLDVILLE)	-	-	-	2 467	2 467
CUBA	-	4 172	13 439	14 186	31 797
DOMINICAN REPUBLIC	-	-	-	2 675	2 675
EL SALVADOR	-	-	1 772	3 084	4 856
ETHIOPIA	-	-	-	2 590	2 590
HAITI	-	2 021	2 337	2 467	6 825
HONDURAS	1 635	2 090	2 337	2 467	8 529
HUNGARY	-	-	10 037	24 055	34 092
LEBANON	-	-	-	3 084	3 084
MALI	-	-	-	2 467	2 467
NICARAGUA	-	2 021	2 337	2 467	6 825
PARAGUAY	1 636	2 090	2 337	2 467	8 530
PERU	-	-	-	4 959	4 959
SENEGAL	-	-	1 379	3 084	4 463
VENEZUELA	-	-	-	25 400	25 400
	3 271	12 394	316 512	515 877	848 054

ANNEX IV

ADVANCES TO THE WORKING CAPITAL FUND

Member	Assessed	Paid	Outstanding
	$	$	$
AFGHANISTAN	1 000	1 000	-
ALBANIA	800	800	-
ARGENTINA	20 400	20 400	-
AUSTRALIA	33 000	33 000	-
AUSTRIA	8 000	8 000	-
BELGIUM	24 000	24 000	-
BRAZIL	18 800	18 800	-
BULGARIA	3 000	3 000	-
BURMA	1 400	1 400	-
BYELORUSSIAN SOVIET SOCIALIST REPUBLIC	8 600	8 600	-
CAMBODIA	800	800	-
CANADA	57 400	57 400	-
CEYLON	1 800	1 800	-
CHILE	5 000	-	5 000
CHINA	92 400	92 400	-
COLOMBIA	5 800	5 800	-
CUBA	4 600	4 600	-
CZECHOSLOVAK SOCIALIST REPUBLIC	16 000	16 000	-
DENMARK	11 000	11 000	-
DOMINICAN REPUBLIC	1 000	1 000	-
ECUADOR	1 000	1 000	-
EL SALVADOR	1 000	1 000	-
ETHIOPIA	1 000	1 000	-
FINLAND	6 600	6 600	-
FRANCE	118 000	118 000	-
GERMANY, FEDERAL REPUBLIC OF	98 200	98 200	-
GHANA	1 200	1 200	-
GREECE	4 200	4 200	-
GUATEMALA	1 000	1 000	-
HAITI	800	800	-
HOLY SEE	800	800	-
HONDURAS	800	800	-
HUNGARY	7 800	7 800	-

Member	Assessed	Paid	Outstanding
	$	$	$
ICELAND	800	800	-
INDIA	45 400	45 400	-
INDONESIA	8 600	8 600	-
IRAN	3 800	3 800	-
IRAQ	1 600	1 600	-
ISRAEL	2 600	2 600	-
ITALY	41 400	41 400	-
JAPAN	40 400	40 400	-
KOREA, REPUBLIC OF	3 800	3 800	-
LEBANON	1 000	-	1 000
LUXEMBOURG	1 000	1 000	-
MALI	800	-	800
MEXICO	13 000	13 000	-
MONACO	800	800	-
MOROCCO	2 600	2 600	-
NETHERLANDS	18 600	18 600	-
NEW ZEALAND	7 800	7 800	-
NICARAGUA	800	800	-
NORWAY	9 000	9 000	-
PAKISTAN	7 400	7 400	-
PARAGUAY	800	-	800
PERU	2 000	2 000	-
PHILIPPINES	8 000	8 000	-
POLAND	25 200	25 200	-
PORTUGAL	3 600	3 600	-
ROMANIA	6 200	6 200	-
SENEGAL	1 000	1 000	-
SOUTH AFRICA	10 400	10 400	-
SPAIN	17 200	17 200	-
SUDAN	1 000	1 000	-
SWEDEN	25 600	25 600	-
SWITZERLAND	17 800	17 800	-
THAILAND	3 000	3 000	-
TUNISIA	1 000	1 000	-
TURKEY	10 800	10 800	-
UKRAINIAN SOVIET SOCIALIST REPUBLIC	33 200	33 200	-

Member	Assessed	Paid	Outstanding
	$	$	$
UNION OF SOVIET SOCIALIST REPUBLICS	250 800	250 800	-
UNITED ARAB REPUBLIC	6 000	6 000	-
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND	143 400	143 400	-
UNITED STATES OF AMERICA	645 400	645 400	-
VENEZUELA	9 200	9 200	-
VIET-NAM	3 600	3 600	-
YUGOSLAVIA	6 400	6 400	-
	2 000 000	1 992 400	7 600
New Member			
CONGO (LEOPOLDVILLE)	800	-	800

ANNEX V

CONTRIBUTIONS TO THE 1962 REGULAR BUDGET

Member	Assessed	Credit	Paid	Outstanding
	$	$	$	$
AFGHANISTAN	3 081	323	2 758	-
ALBANIA	2 464	259	-	2 205
ARGENTINA	62 842	-	-	62 842
AUSTRALIA	101 657	10 888	45 405	45 364
AUSTRIA	24 644	2 585	11 059	11 000
BELGIUM	73 932	7 820	66 112	-
BRAZIL	57 913	-	-	57 913
BULGARIA	9 241	969	-	8 272
BURMA	4 313	452	3 861	-
BYELORUSSIAN SOVIET SOCIALIST REPUBLIC	26 492	2 844	-	23 648
CAMBODIA	2 464	259	346	1 859
CANADA	176 821	18 878	157 943	-
CEYLON	5 545	582	4 963	-
CHILE	15 402	-	-	15 402
CHINA	284 638	-	-	284 638
COLOMBIA	17 867	-	-	17 867
CUBA	14 170	-	-	14 170
CZECHOSLOVAK SOCIALIST REPUBLIC	49 288	5 435	-	43 853
DENMARK	33 885	3 819	30 066	-
DOMINICAN REPUBLIC	3 081	-	-	3 081
ECUADOR	3 081	323	193	2 565
EL SALVADOR	3 081	-	-	3 081
ETHIOPIA	3 081	-	-	3 081
FINLAND	20 331	2 133	-	18 198
FRANCE	363 499	38 990	324 509	-
GERMANY, FEDERAL REPUBLIC OF	302 505	32 391	135 057	135 057
GHANA	3 697	-	3 697	-
GREECE	12 938	1 357	11 581	-
GUATEMALA	3 081	323	-	2 758
HAITI	2 464	-	-	2 464
HOLY SEE	2 464	259	2 205	-
HONDURAS	2 464	-	-	2 464
HUNGARY	24 028	-	-	24 028

Member	Assessed	Credit	Paid	Outstanding
	$	$	$	$
ICELAND	2 464	259	2 205	-
INDIA	139 855	14 935	124 920	-
INDONESIA	26 492	2 844	-	23 648
IRAN	11 706	1 228	-	10 478
IRAQ	4 929	517	4 412	-
ISRAEL	8 009	840	7 169	-
ITALY	127 533	13 707	56 913	56 913
JAPAN	124 452	13 320	111 132	-
KOREA, REPUBLIC OF	11 706	1 228	-	10 478
LEBANON	3 081	-	-	3 081
LUXEMBOURG	3 081	323	2 758	-
MALI	2 464	-	-	2 464
MEXICO	40 046	4 465	35 581	-
MONACO	2 464	259	2 205	-
MOROCCO	8 009	840	-	7 169
NETHERLANDS	57 297	6 075	51 222	-
NEW ZEALAND	24 028	2 521	-	21 507
NICARAGUA	2 464	-	-	2 464
NORWAY	27 724	2 908	-	24 816
PAKISTAN	22 796	2 391	20 405	-
PARAGUAY	2 464	-	-	2 464
PERU	6 161	-	-	6 161
PHILIPPINES	24 644	2 585	22 059	-
POLAND	77 629	-	40 000	37 629
PORTUGAL	11 090	1 428	9 662	-
ROMANIA	19 099	2 068	10 000	7 031
SENEGAL	3 081	-	-	3 081
SOUTH AFRICA	32 037	3 361	28 676	-
SPAIN	52 985	5 558	47 427	-
SUDAN	3 081	323	2 758	-
SWEDEN	78 861	8 537	-	70 324
SWITZERLAND	54 833	6 017	48 816	-
THAILAND	9 241	969	8 272	-
TUNISIA	3 081	323	2 758	-
TURKEY	33 269	3 755	-	29 514

Member	Assessed	Credit	Paid	Outstanding
	$	$	$	$
UKRAINIAN SOVIET SOCIALIST REPUBLIC	102 273	10 993	-	91 280
UNION OF SOVIET SOCIALIST REPUBLICS	772 589	83 091	-	689 498
UNITED ARAB REPUBLIC	18 483	486	-	17 997
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND	441 744	47 262	394 482	-
UNITED STATES OF AMERICA	1 988 155	213 309	-	1 774 846
VENEZUELA	28 341	-	-	28 341
VIET-NAM	11 090	1 428	9 662	-
YUGOSLAVIA	19 715	2 068	4 412	13 235
	6 161 000	593 110	1 847 661	3 720 229
New Member				
CONGO (LEOPOLDVILLE)	2 464	-	-	2 464

ANNEX VI

VOLUNTARY CONTRIBUTIONS TO THE GENERAL FUND

A. For 1962

Member	Pledged	Equivalent in United States dollars (Technical Assistance Board rates)	Paid $
ARGENTINA	$ 15 000[a]	15 000	
AUSTRALIA	$ 20 000	20 000	20 000
AUSTRIA	$ 5 000	5 000	
BELGIUM	Belgian Francs 500 000	10 000	
BRAZIL	$ 18 800	18 800[c]	18 800
BURMA	Burmese Kyats equivalent to $ 1 000	1 000	1 000
CANADA	$ 57 000	57 000[c]	49 000
CHINA	$ 5 000	5 000	5 000
COLOMBIA	$ 2 000	2 000	
DENMARK	$ 11 000	11 000[c]	11 000
FINLAND	$ 6 600	6 600[c]	
FRANCE	[b]		
GERMANY, FEDERAL REPUBLIC OF	$ 65 000	65 000	32 500
GHANA	[b]		
GREECE	$ 2 500	2 500	2 500
HOLY SEE	$ 2 000	2 000[c]	2 000
INDIA	Indian Rupees 119 048	25 000	25 000
INDONESIA	$ 2 000	2 000	
IRAQ	$ 2 000	2 000[c]	2 000
ISRAEL	Israeli £ equivalent to $ 2 222	2 222	
ITALY	$ 35 000	35 000	35 000
JAPAN	$ 28 000	28 000	28 000
KOREA, REPUBLIC OF	$ 3 000	3 000	
MEXICO	$ 8 500	8 500	8 500
MONACO	$ 2 000		
	plus New French Francs 200 000	42 816[c]	
NETHERLANDS	$ 18 600	18 600[c]	18 600
NORWAY	$ 9 000	9 000[c]	
PAKISTAN	Pakistani Rupees equivalent to $ 6 000	6 000	6 000
PHILIPPINES	Philippine Pesos equivalent to $ 4 000	4 000	

Member	Pledged	Equivalent in United States dollars (Technical Assistance Board rates)	Paid $
PORTUGAL	$ 3 600	3 600 c/	3 600
SOUTH AFRICA South African Rands equivalent to	$ 10 400	10 400 c/	
SWEDEN	$ 25 600	25 600 c/	
SWITZERLAND Swiss Francs	50 000	11 628	11 628
THAILAND	$ 3 000	3 000 c/	3 000
TURKEY Lira	40 000	4 444	4 444
UNITED ARAB REPUBLIC Egyptian £	5 000	11 261 c/	11 261
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND £ Sterling equivalent to	$144 000	144 000 c/	144 000
UNITED STATES OF AMERICA	$500 000	500 000	
VENEZUELA	$ 9 200	9 200 c/	
VIET-NAM Vietnamese Piastres equivalent to	$ 2 000	2 000	
YUGOSLAVIA Yugoslav Dinars equivalent to	$ 6 400	6 400 c/	
		1 138 571	442 833
UNITED STATES OF AMERICA (matching contribution) d/		138 571	
		1 277 142	442 833

a/ Minimum pledge.

b/ Amount to be announced later.

c/ Pledge based on a percentage equal to or higher than the Member's assessment under the Regular Budget.

d/ Matching contribution of dollar for dollar of the total pledges above $1 million, until a total of $1.5 million is reached.

B. For 1961

Member	Pledged	Equivalent in United States dollars (Technical Assistance Board rates)	Paid $
ARGENTINA	$ 15 000	15 000	15 000
AUSTRALIA	$ 20 000	20 000	20 000
AUSTRIA	$ 5 000	5 000	5 000
BELGIUM	Belgian Francs 500 000	10 000	10 000
BRAZIL	$ 30 000	30 000	30 000
CANADA	$ 52 020	52 020	52 020
CEYLON	Ceylonese Rupees 10 000	2 100	1 250
CHINA	$ 5 000	5 000	5 000
DENMARK	$ 10 080	10 080	10 080
FINLAND	$ 6 000	6 000	6 000
FRANCE	New French Francs 150 000	30 612	30 612
GERMANY, FEDERAL REPUBLIC OF	$ 50 000	50 000	50 000
GREECE	$ 2 500	2 500	2 500
HOLY SEE	$ 2 000	2 000	2 000
INDIA	Indian Rupees equivalent to $ 25 000	25 000	25 000
IRAQ	$ 3 000	3 000	3 000
ISRAEL	Israeli £ 4 000	1 852	1 852
ITALY	$ 25 000	25 000	25 000
JAPAN	$ 25 000	25 000	25 000
KOREA, REPUBLIC OF	$ 3 000	3 000	3 000
MEXICO	$ 7 500	7 500	7 500
MONACO	$ 2 000		
	plus New French Francs 200 000	42 816	42 816
NETHERLANDS	$ 15 000	15 000	15 000
NORWAY	$ 8 100	8 100	8 100
PAKISTAN	Pakistani Rupees and $ to the value $ 6 000	6 000	6 000
PHILIPPINES	$ 3 000	3 000	3 000
POLAND	Zloty 100 000	4 167	
PORTUGAL	$ 3 500	3 500	3 500
SOUTH AFRICA	South African £ equivalent to $ 15 000	15 000	15 000
SWEDEN	$ 23 220	23 220	23 220
SWITZERLAND	Swiss Francs 50 000	11 521	11 521

Member	Pledged	Equivalent in United States dollars (Technical Assistance Board rates)	Paid $
THAILAND	$ 1 901	1 901	1 901
UNITED ARAB REPUBLIC Egyptian £	5 000	11 261	11 261
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND £ Sterling equivalent to	$140 000	140 000	140 000
UNITED STATES OF AMERICA	$500 000	500 000	500 000
VENEZUELA	$ 8 200	8 200	
YUGOSLAVIA non-convertible Dinars equivalent to	$ 5 000	6 250[a/]	6 250
		1 130 600	1 117 383
UNITED STATES OF AMERICA (matching contribution)		130 600	130 600
		1 261 200	1 247 983

a/ The "equivalent of $5 000 in Yugoslav currency" pledged amounted to Dinars 3 750 000 at the official rate of exchange. At the TAB rate of exchange this payment in Dinars is equivalent to $6 250.

ANNEX VII

A SUMMARY OF WORK CARRIED OUT BY THE ENVIRONMENTAL RADIOACTIVITY SECTION OF THE LABORATORY

(as at 30 June 1962)

A. Analysis of samples

1. A number of samples from the environment, which have been received by the Agency's Laboratory from different Member States, have been analysed for radionuclides or gross activities. A description of such analyses is given in Table I below:

Table I

Type of sample	Number of analyses for						Country of origin
	Gross β	Sr-90	Cs-137	γ-spectrum	Other nuclides	Total	
Rain and snow	11	6	6	3	19(Sr-89, I-131, Ba-140, Ce-141, Ce-144)	45	Austria
River and lake water	11	4	5	1	19(I-131, Ba-140, Ce-141, Ce-144, U, Ra)	40	Austria Switzerland
Tap water	14	14	7	6	15(I-131, Ba-140, Ce-141, Ce-144)	56	Austria
Sea water	4	4	4	-	-	12	Finland
Air filters	208	13	10	11	-	242	Austria Pakistan Sudan
Gummed paper	26	-	-	-	-	26	Sudan
Soil and rocks	29	29	28	1	6(U, Th, Pb, Re)	93	Austria Burma Colombia Switzerland Turkey
Vegetation ash	52	52	46	6	-	156	Finland Turkey United States of America[a]
Milk and cheese	451	471	404	-	64(Sr-89, I-131)	1390	Austria Germany, Federal Republic of[a] Poland Switzerland United States of America[a]

Type of sample	Number of analyses for						Country of origin
	Gross β	Sr-90	Cs-137	γ-spectrum	Other nuclides	Total	
Cereals	40	40	25	-	-	105	Argentina[b/] Australia[b/] Austria Canada[b/] Germany, Federal Republic of[a/] Philippines Union of Soviet Socialist Republics[b/]
Vegetables	34	34	31	-	-	99	Austria
Fruit	25	25	20	-	-	70	Austria
Meat and fish	6	6	6	-	-	18	Austria Germany, Federal Republic of[a/]
Tea leaves	1	1	1	-	-	3	Indonesia
Animal bones	5	5	5	-	-	15	Austria Finland
Human bones	3	3	3	-	-	9	Austria Philippines United States of America[a/]
Urine	10	6	6	-	16(α, Po, Ra, Th, U)	38	Austria
TOTAL	930	713	607	28	139	2417	

a/ Samples for inter-laboratory comparisons.

b/ Analysis of imported wheat carried out at the request of the Austrian Government.

2. In addition a certain number of samples were analysed for stable calcium, strontium, potassium, etc., in order to determine strontium-90/calcium and strontium-90/strontium ratios and evaluate potassium-40 contributions to the caesium-137 photopeak in caesium-137 determinations by gamma counting. Samples of known contents of several radionuclides (strontium-90, caesium-137, etc.) and stable elements (calcium, strontium, potassium) which can be used for standardizing radiochemical procedures were also distributed by the Laboratory following requests from the Government of the Federal Republic of Germany and ICRU..

B. Training in the Agency's Laboratory

3. By 30 June 1962 eleven students had been accepted for training in analytical and sampling techniques at the Agency's Laboratory, as shown in Table II below:

Table II

Member State	Number of students
Austria	4
Finland	1
Indonesia	1
Philippines	1
Poland	1
United Arab Republic	3

C. Advisory services, panels, meetings, etc.

4. In September 1959 a panel was convened in Vienna by the Director General to consider methods of collecting and analysing samples for the determination of trace amounts of radioactive substances in the biosphere. The recommendations of the panel were published in February 1961. [1]

5. The Agency was represented at a meeting of the Ad Hoc Expert Committee on Surveys for Radioactivity in Food and Agriculture, convened by FAO in Rome in July 1961. The text of a handbook drafted at the meeting has been recently published by FAO.

6. A small meeting of consultants which was convened in Vienna in September 1961 discussed special problems arising out of the survey of radioactivity in the subarctic regions of northern Europe.

7. Members of the Agency's Secretariat participated in an inter-agency meeting convened by WMO at Geneva in November 1961, which discussed means of implementing resolution 1629 (XVI) adopted by the General Assembly of the United Nations after considering the annual progress report of UNSCEAR for 1961. A plan was worked out for the implementation of this resolution and, after some changes made by WMO's Panel of Experts on Atomic Energy which convened at Geneva from 16 to 18 April 1962, the plan was submitted to the Executive Committee of WMO at Geneva in May/June 1962.

8. A Seminar on the Agricultural and Public Health Aspects of Radioactive Contamination in Normal and Emergency Situations was organized jointly by FAO, WHO and the Agency in Scheveningen, the Netherlands, in December 1961. Papers presented at the seminar will be published by FAO in due course.

D. Research and publications

9. The following research contracts have been awarded for studies concerning radioactive substances in the biosphere:

[1] Radioactive Substances in the Biosphere, Agency publication No. STI/PUB/28.

Table III

Contract number	Country	Institution	Title of contract
1	Austria	Institutes for Physical and Inorganic Chemistry, University of Vienna	Factors controlling the distribution of fission products in the biosphere
99/RB	Japan	Japan Analytical Chemistry Research Institute, Tokyo	A study on the radiochemical analysis of strontium, cesium and plutonium in biological materials
124/RB	Finland	Institute for Forensic Medicine, University of Helsinki	The radionuclide content of human bone and tissue in Finland in relation to pathological findings
128/RB	Finland	Botanical Institute, University of Helsinki	The uptake of radioactive substances from air by lower plants with special reference to lichens
131/RB	Germany, Federal Republic of	Institute for Legal and Forensic Medicine, University of Kiel	Transfer mechanism of artificial radionuclides in the placenta of man and animals as influenced by inactive carriers

10. Two reports on the survey of radioactivity in food consumed in Austria, which were published as working papers, were submitted to the Austrian Government and copies of them were sent to UNSCEAR. An excerpt from the first of these reports has been published recently in Mitteilungen der Österreichischen Sanitätsverwaltung, Volume 62, pp. 365-375 (1961). An excerpt from the second report will be published in the same journal.

11. A paper entitled Some factors influencing the food-chain transport of radioactive materials into cow's milk, D. Merten and O. Suschny, Nature, Volume 189, p. 806 (1961), was also published.

ANNEX VIII

TECHNICAL ASSISTANCE OFFERED OR PROVIDED BY MEMBER STATES IN 1961 FREE OR PARTIALLY FREE OF CHARGE

Member State	Number of fellowships		Number of experts provided	Equipment in United States dollars	
	offered	awarded		offered	donated and accepted
Argentina	5	5			
Australia			1		
Belgium	6	7			
Brazil	29	9			
China	4	2			
Czechoslovak Socialist Republic	17	7		30 000	
Denmark	5	5			
Finland	2	2			
France	12	12	3		
Germany, Federal Republic of	9	11			
Hungary	4	2			
India	5	6			
Italy	10	9			
Japan	5	5			a/
Netherlands	3	3			
Poland	5	5			
Romania	2				
Spain	5	5			
Union of Soviet Socialist Republics	39	10			
United Arab Republic	6	6 b/			
United Kingdom of Great Britain and Northern Ireland c/			2		
United States of America d/	50	50	6		80 000
TOTAL	223	161	12 e/	30 000	80 000

a/ Special donation of equipment to the Agency's new Laboratory, provided by the Japan Atomic Industrial Forum, Inc.

b/ Used at training courses in the United Arab Republic.

c/ Special offers have been made to provide Agency fellows with advanced research facilities (Radiation Laboratory, Wantage) or with advanced training and operational experience at commercial nuclear power stations.

d/ In addition, an offer was made to provide training in the construction and operation of small and medium power reactors for a limited number of Agency fellows from developing countries.

e/ Three additional experts, who participated in preliminary assistance missions, were provided by Governments free of charge.

ANNEX IX

CONFERENCES, SEMINARS AND SYMPOSIA

A. Held in 1961

Date	Title	Place	Co-sponsoring organizations
Conferences			
15-20 May	Conference on Nuclear Electronics	Belgrade	
4-9 September	Conference on Plasma Physics and Controlled Nuclear Fusion Research	Salzburg, Austria	
21 November-1 December	Conference on the Use of Radioisotopes in Animal Biology and the Medical Sciences	Mexico City	FAO WHO
Seminars			
3-11 August	Seminar on the Physics of Fast and Intermediate Reactors	Vienna	
6-10 November	Regional Seminar on Educational Problems of Nuclear Energy	San Carlos de Bariloche, Argentina	UNESCO IANEC
Symposia			
3-10 May	Symposium on the Detection and Use of Tritium in the Physical and Biological Sciences	Vienna	a/
5-9 June	Symposium on the Effects of Ionizing Radiation on the Nervous System	Vienna	
12-16 June	Symposium on Whole Body Counting	Vienna	
16-21 October	Symposium on the Programming and Utilization of Research Reactors	Vienna	
23-27 October	Symposium on Power Reactor Experiments	Vienna	

a/ Organized in co-operation with the Joint Commission on Applied Radioactivity (of ICSU).

B. Programme for 1962

Date	Title	Place	Co-sponsoring organizations
Conference			
4-9 June	Conference on the Corrosion of Reactor Materials	Salzburg, Austria	
Seminars			
16 July-25 August	Seminar on Theoretical Physics	Trieste, Italy	
5-9 November	Seminar on the Practical Applications of Short-lived Radioisotopes Produced in Small Research Reactors	Vienna	
Symposia			
26 February-2 March	Symposium on the Use of Radioisotopes in Soil-Plant Nutrition Studies	Bombay, India	FAO
7-11 May	Symposium on Radiation Damage in Solids and Reactor Materials	Venice, Italy	
14-18 May	Symposium on Reactor Safety and Hazards Evaluation Techniques	Vienna	
21-25 May	Symposium on the Thermodynamics of Nuclear Materials	Vienna	
2-6 July	Symposium on Biological Effects of Ionizing Radiation at the Molecular Level	Brno, Czechoslovak Socialist Republic	
10-14 September	Symposium on Inelastic Scattering of Neutrons in Solids and Liquids	Chalk River, Canada	
8-13 October	Symposium on the Treatment and Storage of High-level Radioactive Wastes	Vienna	
19-23 November	Symposium on Radioactive Dating	Athens	
10-14 December	Symposium on Neutron Detection, Dosimetry and Standardisation	Harwell, United Kingdom	

ANNEX X

AGENCY PUBLICATIONS[a]

(1 July 1961 - 30 June 1962)

1. Proceedings of Conferences, Symposia, Seminars and Panels[b]

Chemical Effects of Nuclear Transformations, two volumes
Diagnosis and Treatment of Acute Radiation Injury[c]
Education and Nuclear Energy in Latin America[d]
Effects of Ionizing Radiation on the Nervous System
Effects of Ionizing Radiations on Seeds
Inelastic Scattering of Neutrons in Solids and Liquids
Initial Effects of Ionizing Radiations on Cells[e]
Nuclear Electronics, three volumes
Nuclear Ship Propulsion
Physics of Fast and Intermediate Reactors, three volumes
Pile Neutron Research in Physics
Plasma Physics and Controlled Nuclear Fusion Research, first part
Power Reactor Experiments, two volumes
Radioisotopes and Radiation in Entomology
Radioisotopes in the Physical Sciences and Industry, three volumes
Radioisotopes in Tropical Medicine
Small and Medium Power Reactors, two volumes
Therapeutic Dose Distributions with High-Energy Radiation[f]
Tritium in the Physical and Biological Sciences, two volumes
Whole-body Counting

2. Technical Directories

International Directory of Radioisotopes, second edition
Isodose Charts and Depth Dose Tables for Medium Energy X-Rays[g]

3. Safety Series

No. 5	Radioactive Waste Disposal into the Sea[h]
No. 7	Regulations for the Safe Transport of Radioactive Materials: Notes on Certain Aspects of the Regulations[i]
No. 8	Use of Film Badges for Personnel Monitoring

4. Review Series

No. 17	Controlled Thermonuclear Fusion Research
No. 18	Processing of Radioactive Wastes
No. 19	Concept of the Semi-Homogeneous Reactor (SHR) and Present Status of Research in Japan
No. 20	Welding Problems in Nuclear Reactor Construction
No. 21	Heavy Water Production
No. 22	Metallurgy of Thorium Production

5. Bibliographical Series

No. 4	Geology of Uranium and Thorium
No. 5	Disposal of Radioactive Wastes into Marine and Fresh Waters
No. 6	Effects of Neutron Irradiation in Non-Fissionable Metals and Alloys
No. 7	Research on Controlled Thermonuclear Fusion

6. Technical Reports Series

No. 3	Prospects of Nuclear Power in the Philippines
No. 4	IAEA Research Contracts, First Annual Report[h]
No. 5	Introduction to the Methods of Estimating Nuclear Power Generating Costs
No. 6	The Vinča Dosimetry Experiment
No. 7	Prospects of Nuclear Power in Pakistan

7. Journals

Nuclear Fusion - Journal of Plasma Physics and Thermonuclear Fusion, Volume I, Nos. 3 and 4
International Atomic Energy Agency Bulletin, four issues[h]

8. Miscellaneous

Conferences, Meetings, Training Courses in Atomic Energy, Nos. 13-18
IAEA Publications Catalogue, 1958-1961[j]
IAEA Publications Catalogue, 1958-1961; first supplement[j]
List of Periodicals in the Field of Nuclear Energy, No. 2
List of References on Nuclear Energy, Volume 3, Nos. 12-24; Volume 4, Nos. 1-12
Reports of Preliminary Assistance Missions to Ghana and Peru[k]
Reports of an IAEA Mission to Dahomey[i], Liberia and Nigeria
Services and Technical Assistance Available from the IAEA[h]
The Exchange Programme in Nuclear Science[h]
World List of Institutions Concerned with Nuclear Energy: Ghana and Belgium

---

a/ Published in English, unless otherwise indicated.

b/ Contributions published in the original language (English, French, Russian or Spanish) with abstracts in English, French, Russian and Spanish. Discussions in English.

c/ Published by WHO.

d/ Spanish edition only.

e/ Published by the Academic Press.

f/ Published in Russian.

g/ Published by Butterworths Ltd., London.

h/ Published in English, French, Russian and Spanish.

i/ Published in English and French.

j/ Published in English, French, Russian, Spanish and German.

k/ Published in English and Spanish.

ANNEX XI

RESEARCH CONTRACTS
(1 January - 31 December 1961)

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
		A. Radioactive waste management and environmental research		
		1. New contracts		
62/US	Italy	Department of Zoology, University of Parma	Ecology of Acantharia (radiolaria) in relation to the circulation of strontium in the sea	16 174
106/RB[b]	Portugal	National Laboratory for Civil Engineering, Ministry of Public Works, Lisbon	Study of the depth distribution of sediments released from a point source and the development of more rapid methods for such determinations	6 850
118/RB	Israel	Sea Fisheries Research Station, Ministry of Agriculture, in conjunction with the Geological Survey of Israel, Ministry of Development and the Israel Atomic Energy Commission, Haifa	Study of physico-chemical-biological processes affecting the dispersion of radionuclides	14 000
123/RB	Netherlands	Laboratory of Soils and Fertilizers, State Agricultural University, Wageningen	Investigation of the ion absorption characteristics of soils	7 100
		2. Renewals		
$9R_2$/RB	Austria	Atomic Institute of the Austrian Universities, Vienna	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	2 200
$20R_2$/RB	Japan	Fisheries Institute, Faculty of Agriculture, University of Tokyo	Studies in uptake of radioisotopes by edible marine products	4 000

Contract number[a/]	Country	Institution	Title of contract	Amount of Agency contribution in US $
33R$_1$/RB	Argentina	National Atomic Energy Commission, Risk Evaluation Group, Health Physics Division, Buenos Aires	Behaviour of fission products in soil	6 000
88R$_1$/RB	Japan	Japan Analytical Chemistry Research Institute, Tokyo	The study of radionuclides sorbed on marine sediments	5 220
94R$_1$/RB	United States of America	Marine Laboratory, University of Miami, Florida	The uptake, accumulation and exchange of radioisotopes by open sea phytoplankton	14 450
99R$_1$/RB	Japan	Japan Analytical Chemistry Research Institute, Tokyo	Study on the radiochemical analysis of strontium, cesium and plutonium in biological materials	4 320
101R$_1$/RB	United States of America	Department of Soils and Plant Nutrition, University of California, Berkeley, California	Investigation of ionic exchange in soils using radioisotopes and isotopic dilution experiments	6 000
		3. Completed contracts		
1/RB	Austria	Institutes for Physical Chemistry and for Inorganic Chemistry, University of Vienna	Factors controlling the distribution of fission products in the biosphere	19 620[c/]
19/RB	Japan	Institute of Inorganic Chemistry, Faculty of Sciences, Tokyo Kyoiku University, Tokyo	Studies of contamination in local marine resources and more specifically the determination of horizontal and vertical diffusion rates in Suruga Bay	8 000[c/]
22/RB	Italy	National Committee for Nuclear Energy, Laboratory of Oceanography, Fiascherino, La Spezia	Study of uptake, accumulation and loss of radioactive material by marine bacteria	29 400[c/]
57/RB	Australia	Commonwealth Scientific and Industrial Research Organization, Division of Plant Industry, Canberra	Investigation of the factors which influence the movement of strontium-90 from soils to plants	6 800

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
59/RB	Italy	Limnology Division, Centre of Nuclear Studies, Ispra and the Italian Institute of Hydrobiology, Pallanza	Studies on the biological concentration of fission products in molluscs from water with special reference to an index of radioactivity in water	14 800
97/RB	Czechoslovak Socialist Republic	Institute of Nuclear Research, Czechoslovak Academy of Sciences, Prague	Physico-chemical requirements for the disposal of low-activity liquid radioactive wastes in soil	8 300
		B. Health physics and radiation protection		
		1. New contracts		
107/RB	Czechoslovak Socialist Republic	Department of Ionizing Radiation, Institute of Industrial Hygiene and Occupational Diseases, Prague	Study of internal contamination with strontium-90 and radium-226 in man in relation to clinical findings	18 440
108/RB	Belgium	Department of Radiobiology, Nuclear Research Centre, Mol-Donk	Influence of chemical radiation protectors on the effects of X-ray therapy of spontaneous and grafted cancer in mice	8 000
112/RB	Netherlands	Laboratory of Radiopathology, University of Groningen	Study of a new kind of chemical protection against radiopathological effects, due to deposition of Ba-140 in the aortic wall in experimental animals and in humans	8 000
113/RB	Yugoslavia	Institute for Medical Research, Department of Biophysics and the Department of Chemistry, Yugoslav Academy of Sciences and Arts, Zagreb	Some factors influencing mammalian retention of radioactive strontium	10 123
114/RB	Belgium	Institute of Experimental Therapeutics, Faculty of Medicine, University of Liège	Fixation of isotopes (calcium and phosphorus) and histological bone structure	4 200

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
117/RB	Japan	Department of Industrial Hygiene, Institute of Public Health, Tokyo	A biological method to detect and evaluate radiation effect in the range of 50-100 roentgen	3 590
120/RB	Argentina	Radioisotope Centre, Instituto Modelo Luis Agote - IV Cátedra de Clinica Médica, Hospital Rawson, Buenos Aires	The influence of disorders of the thyroid on calcium metabolism of human beings	2 400
124/RB	Finland	University of Helsinki, Department of Forensic Medicine, Helsinki	Radionuclide content (^{90}Sr and ^{137}Cs) of human bones and tissues in Finland in relation to pathological findings	7 810
125/RB	Netherlands	Biological Department, Netherlands Cancer Institute, Amsterdam	Radiosensitivity of germ-free animals	7 780
126/RB	Poland	Institute of Occupational Medicine, Department of Radiological Protection, Clinical Department of Occupational Diseases, Lódź	Investigation of the metabolism and clinical effects of strontium-90 and radium in humans	12 500
128/RB	Finland	Botanical Institute, University of Helsinki	The uptake of radioactive substances from air by lower plants with special reference to the nutrition of lichens	7 750
131/RB	Federal Republic of Germany	Institute for Legal and Forensic Medicine, University of Kiel	Transfer mechanism of artificial radionuclides in the placenta of man and animals as influenced by inactive carriers	9 300
		2. Renewals		
$14R_2$/RB	Austria	Institute of Plant Physiology, University of Vienna	Effect of radiation on plant cells and its modification with protective substances	2 796

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
$18R_2$/RB	Netherlands	Radiobiological Department of the Physiological Institute, University of Groningen	Investigation of intracellular chemical radiation protection substances, using as indicator immediate low-level X-ray reactions	8 000
$32R_1$/US	France	French Atomic Energy Commission, Paris	Determination of the enrichment factors of calcium isotopes on ion exchange resins and investigation of the various systems of electrolytic separation	15 000
$34R_2$/RB	Czechoslovak Socialist Republic	Institute of Biology, Department of Experimental Biology and Genetics, Czechoslovak Academy of Sciences, Prague	Investigation of a method of two-step grafting of haematopoietic and germinal tissues to counteract incipient radiation sterility resulting from accidental exposure to ionizing radiation	6 000
$38R_2$/RB	Switzerland	Radium Institute of Geneva	Measurement of radium and radiostrontium accumulation in humans and study of its biological effects	10 500
$44R_2$/RB	Yugoslavia	Biological Laboratory, Boris Kidrič Institute of Nuclear Sciences, Belgrade	The recovery effects of highly polymerized (native) nucleic acids injected into lethally irradiated animals	7 680
$48R_1$/RB	Yugoslavia	Department of Pathophysiology, Biological Laboratory, Boris Kidrič Institute of Nuclear Sciences, Belgrade	Radioiron study on physiological properties and role of haematopoietin (anaemic factor) in the haematopoietic regeneration of irradiated animals	2 850
$53R_2$/RB	Austria	Institute for Applied Microbiology, Agricultural University, Vienna	Selection of sulfhydryl compounds for radiation protection, using a new microbiological method	3 000
$73R_1$/RB	South Africa	Department of Medicine, University of Cape Town	A study of rickets using Ca-47	4 080

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
$74R_1$/RB	Poland	Department of Isotopes, Institute of Oncology, Warsaw	Diagnostic application of Ca-47 in metastatic bone lesions	2 250
$75R_1$/RB	Belgium	Institute of Anatomy, Catholic University, Louvain	The investigation of the rate of bone remodelling in normal and fractured long bone of the dog, with special reference to the vascular aspects	1 125
$76R_1$/RB	United Kingdom	Department of Medicine, Gardiner Institute, University of Glasgow	In vitro and in vivo studies with Ca-47 and other bone seeking isotopes	3 250
$77R_1$/RB	France	Isotope Service, Fédération Mutualiste de la Seine, Paris	The use of Ca-47 in the diagnosis of skeletal lesions in man	1 500
$80R_1$/RB	United Kingdom	Guy's Hospital Medical School, Department of Experimental Medicine, London	Studies of calcium metabolism in bone diseases using Ca-47, with particular reference to gastro-intestinal absorption	1 500
$82R_1$/RB	United Kingdom	Postgraduate Medical School of London, Department of Endocrinology	Studies of bone metabolism in man with Ca-47	500
$93R_1$/RB	France	Research Centre for Cancer and Radiopathology, Association Claude Bernard, St. Louis Hospital, Paris	The use of bone marrow grafting in the treatment of accidentally irradiated persons and in animal experiments	11 650
		3. Completed contract		
78/RB	Austria	First Medical Department, University of Vienna	Calcium balance studies in metabolic bone disease	1 000[d]

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
		C. Radiobiology		
		1. New contracts		
46/RB[e]	Federal Republic of Germany	Institute of Physiological Chemistry, Johannes Gutenberg University, Mainz	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	7 800
103/US	United Kingdom	Chester Beatty Research Institute, Royal Cancer Hospital, London	Tissue therapy after irradiation	5 000
		2. Renewals		
$10R_2$/RB	United Kingdom	Chester Beatty Research Institute, Institute of Cancer Research	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	7 600
$11R_2$/US	Sweden	Institute for Medical Genetics, University of Uppsala	Genetical investigations on the effect of ionizing radiation on human cells grown in vitro	12 920
$15R_1$/RB	Belgium	Laboratory of General Pathology, Laboratory of Microbiology, and the Laboratory of Biochemistry, University of Liège	Chemically induced metabolic modifications of cells susceptible to modify the sensitivity of microorganisms to ionizing radiations	9 000
$29R_2$/RB	France	Agricultural Research Station, Ministry of Agriculture, Versailles	Study of the radiosensitivity and isolation of radioresistant strains of Lactobacillus	11 000

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
$30R_2$/RB	France	Central Dairy Microbiology Research Station, Ministry of Agriculture, Jouy-en-Josas	Study of the mechanism of activation and inactivation of bacterial spores with ionizing radiations	13 800
$31R_1$/US[f]	Finland	Division of Genetics, Department of Botany, University of Turku	Mutation rate at specific autosomal loci in different species of Drosophila	9 350
$31R_2$/US[f]	Finland	Division of Genetics, Department of Botany, University of Turku	Mutation rate at specific autosomal loci in different species of Drosophila	9 700
$35R_2$/RB	United Kingdom	Department of Biochemistry, University of Oxford	Study of the primary biochemical lesions produced by ionizing radiations in mammalian tissues	3 900
$36R_2$/RB	Italy	Institute of Zoology and Comparative Anatomy, University of Padova	A quantitative evaluation of cell survival as a function of radiation dose	7 000
$39R_2$/RB	Switzerland	Institute of Physiology, University of Geneva	Changes in spontaneous activities and in artificially stimulated electrophysiological responses of the nervous system of unanaesthetized animals exposed to various doses of localized radiations	5 830
$43R_1$/RB	Poland	Laboratory of Radiation Chemistry, Institute of Nuclear Research, Warsaw	Investigation of primary and intermediate products of gamma radiation on aqueous solutions by absorption spectroscopy applied during irradiation	3 420
$51R_1$/RB	Netherlands	Laboratory for Applied Enzymology and Radiobiology of the State University of Leyden	Investigation of the effects of ionizing radiation on the genetic material of bacteriophages with emphasis on the production, fractionation and purification of irradiated DNA	13 000

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
$83R_1$/RB	India	Vallabhbhai Patel Chest Institute, University of Delhi	The immediate effect of radiation on fatty acid metabolism	3 740
$85R_1$/RB	Spain	Institute Gregorio Marañón, Centre of Biological Research, Madrid	Peripheral metabolism of thyroid hormone(s) via deshalogenating pathways and its role in thyroid-pituitary interrelationships and metabolic effectiveness	8 480
$86R_1$/RB	Australia	Department of Bacteriology, University of Melbourne	The influence of radiation and radiomimetic chemicals on genetic transduction in Pseudomonas aeruginosa	3 065
$91R_1$/RB	Hungary	Department of Food Technology and Microbiology, College of Horticulture and Viticulture, Budapest	Study of the relative radiosensitivities of moulds and their pectic enzymes	5 500
$95R_1$/RB	Chile	Radioisotopes Laboratory, Institute of Experimental Medicine, University of Chile, Santiago	Effects of radiations (large and low doses) on the metabolism of the central nervous system	14 400
		3. Completed contracts		
42/RB	Poland	Department of Health Protection, Institute of Nuclear Research, Warsaw	Mechanism of proteolysis of I-131 labelled fibrinogen	5 940[c]
45/RB	Norway	Norsk Hydro's Institute for Cancer Research, The Norwegian Radium Hospital, Oslo	An investigation of the radiosensitivity of the spermatogonia of Drosophila melanogaster	13 000[c]
84/RB	United Kingdom	Department of Radiotherapeutics, University of Cambridge, and the Radiotherapeutic Centre, Adden-Brooke's Hospital	Development of radioactive drugs, with special reference to tritiated drugs as radiotherapeutic agents	4 000

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
		D. Safeguards methods		
		1. New contracts		
121/RB	Austria	Austrian Atomic Energy Society, Vienna	Destructive analysis of unirradiated and irradiated fuels	55 000
129/RB	Yugoslavia	Laboratory of Physical Chemistry, Boris Kidrič Institute of Nuclear Sciences, Belgrade	Determination of the tritium build-up in a heavy water moderated reactor	9 320
		2. Renewal		
$87R_1$/RB	Italy	United Laboratories of Studies and Research, San Donato Milanese	Development of a method of non-destructive analysis of irradiated fuel elements for uranium-235 and plutonium content by monitoring and spectrometry	5 000
		3. Completed contracts		
41/RB	Poland	Department of Reactor Exploitation, Institute of Nuclear Research, Warsaw	Non-destructive analysis of irradiated fuel elements using a flux integrating monitor	5 200
47/RB	Norway	Atomic Energy Institute, Kjeller, Lillestrøm	Non-destructive analysis of irradiated fuel elements by gamma ray scanning	16 000
49/RB[g]	Federal Republic of Germany	Institute of Physics, University of Giessen	Non-destructive measurement of burn-up of fuel elements using a monitoring method based on changes of physical properties of solids under irradiation	9 800
		E. Studies involving the use of reactors		
		1. New contracts		
104/US	Norway	Atomic Energy Institute, Kjeller, Lillestrøm	An experimental program in reactor physics (NORA reactor project)	54 000

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
109/RB	Hungary	Thermo-Power Design Office, Ministry of Heavy Industry, Budapest	Present status and future trends of heat-producing nuclear plants	6 300
115/RB	Spain	Physics Division, Nuclear Energy Commission, Madrid	Studies on the properties of moderating and multiplying media by means of the pulsed neutron technique	15 100
116/RB	Sweden	Department of Materials, Research and Development, Aktiebolaget Atomenergi, Stockholm	Metallographic study of the transformation of gamma-phase into alpha + delta or gamma prime phases in low molybdenum-uranium alloys	18 000
130/RB	Yugoslavia	Laboratory of Physics, Boris Kidrič Institute of Nuclear Sciences, Belgrade	Measurement of fast neutron spectra inside a reactor	5 380
		2. Renewal		
$60R_1$/RB	Israel	Department of Nuclear Sciences, Technion-Israel Institute of Technology, Haifa	Study of the stability of reactor systems by means of an analog simulator	5 410
		F. Application of radioisotopes in agriculture		
		1. New contracts		
70/US	United Kingdom	National Institute for Research in Dairying, Shinfield, Berkshire	The digestion, absorption, transport and metabolism of fats in the ruminant	15 550
110/US	Australia	Commonwealth Scientific and Industrial Research Organization, Melbourne	Measurement of mutation rates in plants induced by different mutagenic radiations delivered at widely differing intensities	5 650
119/OB	China	Animal Husbandry Department, College of Agriculture, National Taiwan University, Taipei	Use of radioactive carbon-14 compounds in animal metabolic research	5 455

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
		2. Renewals		
21R$_2$/OB	Japan	Institute of Plant Nutrition and Fertilizer, Faculty of Agriculture, University of Tokyo	Studies on the use of radioactive isotopes for fertilizer evaluation	2 800
27R$_2$/OB	Japan	Kihara Institute for Biological Research, Yokohama	The application of radiation induced mutations to plant breeding	5 940
55R$_1$/OB	Yugoslavia	Department of Plant Breeding and Genetics, Faculty of Agriculture and Forestry, Zagreb	The production of useful mutations in agricultural plants through radiation	1 000
56/OB[h]	Federal Republic of Germany	Institute for Agricultural Chemistry and Soil Science, University of Göttingen	Mode of action of raw phosphate fertilizers and their limits of application	7 670
90R$_1$/OB	Portugal	Isotope Laboratory, National Institute of Agronomy, Sacavém	Study of the ways of avoiding fertilizer phosphorus fixation and increasing the availability of the soil phosphorus in brown, red and yellow mediterranean soils	4 000
		G. Application of radioisotopes in hydrology		
		1. New contract		
132/RB	Italy	Experimental Geophysical Observatory, Trieste	Use of tritium for studying underground water connections in karstic regions	2 400
		H. Application of radioisotopes in medicine		
		1. New contracts		
105/US	Venezuela	Instituto Venezolano de Investigaciones Cientificas (I.V.I.C.), Altos de Pipe, Estado Miranda	Radioisotope study of the intestinal absorption in hookworm-infested patients	11 100
127/RB	Israel	Department of Experimental Medicine and Cancer Research, The Hebrew University, Hadassah Medical School, Jerusalem	Metabolism of iodinated amino acids in the human	28 330

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
133/OB	Kenya	Wellcome Trust research Laboratories, Nairobi	Radioisotope investigation of the causes of anaemia in tropical regions	10 250
134/RB	India	Wellcome Research Unit, Christion Medical College Hospital, Vellore	Radioisotopic study of the mechanisms of intestinal absorption and their disorder in tropical malabsorption syndrome	20 090
		2. Renewals		
$8R_2$/OB	Greece	Department of Clinical Therapeutics, Alexandra Hospital, University of Athens	Studies of iron metabolism with radioiron and of red cell life span with radiochromium in patients suffering from either thalassaemia or sickle cell anaemia	6 200
$24R_1$/OB	Thailand	University of Medical Science, Bangkok	Red cell survival studies with radioisotopes in thalassaemia haemoglobin E and thalassaemia haemoglobin H disease	2 600
$25R_2$/OB	Philippines	Radioisotope Laboratory and Thyroid Clinic, University of the Philippines, Philippine General Hospital, Manila	Radioisotope investigation of the cause of endemic goitre in various places in the Philippines	8 900
$54R_1$/OB	Israel	Tel Hashomer Government Hospital, Radium and Isotopes Institute, Tel Hashomer	Use of radioisotope scanning in liver pathology	10 200
		3. Completed contracts		
26/OB	Iraq	Radioisotopes Department, Republic Hospital, Baghdad	(a) Red cell life span in patients with congenital or acquired haemolytic anaemia, using radiochromium and preoperative spleen scanning (b) The aetiology of tropical iron deficiency anaemia, using radioiron in patients with parasitic infections and in cases losing iron through sweat or desquamation	9 600[c]

Contract number[a]	Country	Institution	Title of contract	Amount of Agency contribution in US $
		I. Miscellaneous		
		1. New contract		
65/US	Norway	Department of Pharmacology, University of Bergen	The phosphate metabolism of Escherichia coli	2 900
		2. Renewals - none		
		3. Completed contract		
72/US	Austria	First Physical Institute, University of Vienna	Investigations of the decay scheme of Tl-210 (RaC")	4 000

a/ Explanation of abbreviations:

..R_1,..R_2,..R_3- first, second, third renewal of contract;
../RB - financed from the Regular Budget;
../OB - financed from the Operational Budget;
../US - financed from funds provided by the United States of America.

b/ Due to the departure from the institute of the Chief Investigator this contract had to be cancelled.

c/ Total cost, including that of renewals.

d/ Although the sum specified in the contract was $1000, the actual Agency contribution was $400 due to the unexpectedly rapid completion of the project.

e/ This contract was actually concluded in 1960. Due to difficulties in the recruitment of additional scientific staff, however, it was not possible to begin work on the project and the contract was accordingly cancelled.

f/ Due to administrative delays in concluding contractual arrangements for the first renewal of contract 31, both renewals were actually concluded during 1961.

g/ Although work was begun on the project, technical difficulties arose which could not be solved before the end of the contract period and it proved necessary to cancel the contract.

h/ The first renewal of this contract has been financed directly by the Government of the Federal Republic of Germany. The Agency continues to receive reports of results obtained, however, and it is probable that the Agency will resume financial support of the contract for the period of the second renewal.

ANNEX XII

REFERENCES TO PUBLICATIONS REPORTING RESULTS OF WORK DONE UNDER AGENCY RESEARCH CONTRACTS

Publication	Contract number[a]
(16)[b] G. Marin and G. Colombo: Effetti dei raggi X su cellule di cavia coltivate in vitro (Effects of X-radiation on guinea-pig cells cultivated in vitro). Atti Associazione Genetica Italiana, Vol. 6, p. 125 (1961)	36
(17) G. Colombo and G. Marin: Accrescimento in vitro di singole colonie di un ceppo di cellule di rene di cavia (R.C.P.) (Growth in vitro of single colonies of a cell strain derived from guinea-pig kidneys). Bollettino della Società Italiana di Biologia Sperimentale, Vol. 36, p. 1594 (1960)	36
(18) W. Th. Daems, J.H. van de Pol and J.A. Cohen: Some Remarks on the Morphology of Bacteriophage T4B. Journal of Molecular Biology, Vol. 3, p. 225 (1961)	51
(19) A. v. Szilvinyi and U. Rosenkranz: Radiation Effect on Yeasts of the Genus Candida Berkhout. Nature, Vol. 190, p. 1212 (1961)	53
(20) J. Korkisch and G.E. Janauer: On the use of Azo Dyes for the Spectrophotometric Determination of Uranium and Thorium in Mixed Solvents. I. The Determination of Tetra- and Hexavalent Uranium by Means of Solochrome Black 6 BN. Mikrochimica Acta, No. 4, p. 537 (1961)	67
(21) J. Korkisch and G.E. Janauer: Methods for the Spectrophotometric Determination of Thorium and Tetravalent Uranium by Means of the Azodye Solochrome Fast Grey R.A.S. Zeitschrift für analytische Chemie, Vol. 182, p. 26 (1961)	67
(22) M.G. Ord and L.A. Stocken: Acid-soluble Phosphate Metabolism in Nuclei from Rat Thymus Gland. Biochemical Journal, Vol. 81, p. 1 (1961)	35
(23) Y. Ikeda, H. Saito: Effects of Incorporated Radioisotopes Upon the Stability of Genetic Materials. Journal of General and Applied Microbiology, Vol. 7, p. 206 (1961)	13
(24) K.-H. Gustavson and J.I. Ek: Triple Stem-Line Mosaicism in Mongolism. Lancet, Vol. ii, p. 319 (1961)	11
(25) J.A. Böök and B. Santesson: Nuclear Sex in Triploid XXY Human Cells. Lancet, Vol. ii, p. 318 (1961)	11
(26) A. v. Szilvinyi, U. Rosenkranz and H. Manschinger: Ueber den Einfluss von Sulfhydrylverbindungen auf Strahlungsschäden an Candida Berkhout (On the influence of sulfhydryl compounds on radiation damage in Candida Berkhout). Die Naturwissenschaften, Vol. 48, p. 533 (1961)	53

Publication		Contract number[a]
(27)	J. Korkisch and G.E. Janauer: Spectrophotometric Determination of Microgram Quantities of Hexavalent Uranium. Zeitschrift für analytische Chemie, Vol. 183, p. 85 (1961)	67
(28)	F. Tera and J. Korkisch: Separation of Uranium by Anion Exchange. Analytica Chimica Acta, Vol. 25, p. 222 (1961)	67
(29)	A. v. Szilvinyi and U. Rosenkranz: Ein neuer Strahlungseffekt an Hefen der Gattung Candida Berkhout (A new radiation effect in yeasts of the genus Candida Berkhout). Mitteilungen der Versuchsstation für das Gärungsgewerbe, No. 9/10 (1960)	53
(30)	A. v. Szilvinyi: Ueber den Einfluss von Sulfhydrylverbindungen auf das Zellteilungsvermögen von Candida Berkhout (On the effects of sulfhydryl compounds on the cell division capacity of Candida Berkhout). Die Naturwissenschaften, Vol. 47, p. 140 (1960)	53
(31)	F. Escobar del Rey, G. Morreale de Escobar, M.D. Garcia Garcia and J. Mouriz Garcia: Increase of the Rate of Release of Thyroidal Iodine-131 and of Circulating Thyrotrophic Activity at Early Stages of Propylthiouracil Treatment in the Rat. Nature, Vol. 191, p. 1171 (1961)	85
(32)	J. Korkisch and F. Tera: Separation of Thorium by Anion Exchange. Analytical Chemistry, Vol. 33, p. 1264 (1961)	67
(33)	B. Malamos, E.H. Belcher, E. Gyftaki and D. Binopoulos: Simultaneous Studies with Fe-59 and Cr-51 in Congenital Haemolytic Anaemias. Nuclear Medicine, Vol. 2, p. 1 (1961)	8
(34)	R. Brinkman, H.B. Lamberts, J. Wadel and J. Zuideveld: Contributions to the Study of Immediate and Early X-ray Reactions with Regard to Chemoprotection. I. Further Analysis of the Immediate Drop in Injection Pressure on Moderate Irradiation. International Journal of Radiation Biology, Vol. 3, p. 205 (1961)	18
(35)	P. Dupuy and O. Tremeau: Résistance aux radiations ionisantes de quelques souches de Lactobacillus (Resistance of certain strains of Lactobacillus to ionizing radiations). International Journal of Applied Radiation and Isotopes, Vol. 11, p. 145 (1961)	29
(36)	M.M. Simić and V.S. Sljivić: The Role of the Time Relation Between Immunization and Irradiation on the Inhibition of the Primary Hemolysin Response in Rats. Bulletin of the Boris Kidrič Institute of Nuclear Sciences, Vol. 11, p. 255 (1961)	44
(37)	V.R. Glišin, T. Hudnik-Plevnik, M.M. Simić and D.T. Kanazir: Some Changes of Physical-Chemical Properties of Deoxyribonucleic Acid Isolated from Salmonella Typhimurium Irradiated by UV and Gamma Rays. Bulletin of the Boris Kidrič Institute of Nuclear Sciences, Vol. 11, p. 219 (1961)	44

Publication		Contract number[a]
(38)	M. M. Simić, V. S. Šljivić and M. Ž. Petković: Effects of Some Pyrimidine Analogues on the Formation of Circulating Antibody. Bulletin of the Boris Kidrič Institute of Nuclear Sciences, Vol. 11, p. 235 (1961)	44
(39)	B. Malamos, E. H. Belcher, E. Gyftaki and D. Binopoulos: Radioactive Tracer Studies of Haemoglobin Synthesis, Erythropoiesis and Red Cell Destruction in Congenital Haemolytic Anaemias. Transact. Symposion "Nuklearmedizin in der Klinik", Westdeutscher Verlag, Köln und Opladen (1961)	8
(40)	H. Gaul and L. Mittelstenscheid: Untersuchungen zur Selektion von Kleinmutationen bei Gerste (Studies on selection of micromutations in barley). Zeitschrift für Pflanzenzüchtung, Vol. 45, p. 300 (1961)	66
(41)	G. Bellini, A. Bianchi and E. Ottaviano: The Use of Interchanges Involving B-Type Chromosomes in Studying Artificial Mutagenesis in Maize. Zeitschrift für Vererbungslehre, Vol. 92, p. 85 (1961)	64
(42)	D. G. Scheuring and Roy Overstreet: Sodium Uptake by Excised Barley Roots from Sodium Bentonite Suspensions and from their Equilibrium Filtrates. Soil Science, Vol. 92, p. 166 (1961)	101
(43)	J. Korkisch and G. E. Janauer: Spectrophotometric Determination of Microgram Amounts of Uranium with Solochromate Fast Red. Analytica Chimica Acta, Vol. 25, p. 463 (1961)	67
(44)	T. Hudnik-Plevnik and L. A. Stocken: Chromatography and Nucleotide Sequences of Deoxyribonucleic Acid Synthesized in Salmonella typhimurium After Irradiation with Ultra-Violet. Nature, Vol. 192, p. 554 (1961)	44
(45)	S. D. Bhandarkar, M. M. Bluhm, M. MacGregor and B.E.C.Nordin: An Isotope Test of Calcium Absorption. British Medical Journal, Vol. ii, p. 1539 (1961)	76
(46)	B. Malamos, E. H. Belcher, E. Gyftaki and D. Binopoulos: Simultaneous Radioactive Tracer Studies of Erythropoiesis and Red-Cell Destruction in Thalassaemia. British Journal of Haematology, Vol. VII, p. 411 (1961)	8
(47)	F. Tera and J. Korkisch: Ion Exchange in Mixed Solvents. V. The Distribution of Hexavalent Uranium Between Alcohol-Hydrochloric Acid Solutions and the Strongly Basic Anion Exchanger Dowex-1 - Mechanism of Uranium Adsorption. Journal of Inorganic and Nuclear Chemistry, Vol. 20, p. 335 (1961)	67
(48)	J. Korkisch and G. E. Janauer: The Spectrophotometric Determination of Thorium with Erichrome Black T. Mikrochimica Acta, No. 6, p. 880 (1961)	67

Publication		Contract number[a]
(49)	A. Szilvinyi, H. Manschinger, A. Rath and U. Rosenkranz: Versuch einer mikrobiologischen Testung der strahlenschützenden Wirkung von Sulfhydrylverbindungen (Microbiological testing of the radiation protection effect of sulfhydryl compounds). Die Naturwissenschaften, Vol. 48, p. 742 (1961)	53
(50)	V. Viranuvatti: The Use of Radioisotopes in the Study of Haemolytic Anaemia. Symposium Proceedings "Radioisotopes in Tropical Medicine", p. 119, IAEA, Vienna (1962)	24
(51)	P.C. Campos, B.S. Baltasar, N. Grabato, L.T. Moya and A.O. Clemente: The Use of Radioiodine in Endemic Goitre Investigations. Symposium Proceedings "Radioisotopes in Tropical Medicine", p. 151, IAEA, Vienna (1962)	25
(52)	K. Liebscher, T. Schönfeld and A. Schaller: Concentration of Inhaled Cerium-144 in Pulmonary Lymph Nodes of Human Beings. Nature, Vol. 192, p. 1308 (1961)	1
(53)	O. Bobleter and K. Buchtela: Ein Kationenaustauscher auf Holz- bzw. Ligninbasis für Entaktivierungszwecke (A cation exchanger on wood and lignin basis for decontamination purposes). Atomkernenergie, Vol. 6, p. 476 (1961)	9
(54)	R. Biebl, W. Url and G. Janeček: Untersuchungen über Strahlenschutz an Pflanzenzellen. II. Schutzwirkung verschiedener schwefelhaltiger Verbindungen gegen kurzwelligen UV-Strahlen (Radiation protection research using plant cells. II. Protective effect of various sulfuric compounds against short-wave ultra-violet rays). Protoplasma, Vol. 54, p. 263 (1961)	14
(55)	R. Biebl: Protection Against the Effect of Short-Wave UV-Rays on Plant Cells. In: B. Chr. Christensen and B. Buchmann (Editors), Progress in Photobiology, Proceedings of the 3rd International Congress on Photobiology, p. 283 (1961)	14
(56)	J. Korkisch and F. Tera: Anion Exchange Separation of Thorium from Uranium. Journal of Chromatography, Vol. 6, p. 530 (1961)	67
(57)	J. Korkisch and G.E. Janauer: Spectrophotometric Determination of Thorium with Solochromate Fast Red. Analytical Chemistry, Vol. 33, p. 1930 (1961)	67
(58)	M. Kopeć, Z. Wegrzynowicz, S. Lopaciuk and J. Beer: Fibrinolytische Aktivität im Strahlensyndrom bei Hunden (Fibrinolytic activity in cases of radiation syndrome in dogs). Thrombosis et Diathesis Haemorrhagica, Vol. V, p. 583 (1961)	42

Publication	Contract number[a]
(59) J. Korkisch and F. Tera: Anion Exchange Separation of Uranium, Thorium and Bismuth. Zeitschrift für analytische Chemie, Vol. 186, p. 290 (1962)	67
(60) G. Wittmer: Mutabilità poligenica indotta da raggi X in Nicotiana Tabacum (X-ray induced polygenic mutability in Nicotiana Tabacum). Il Tabacco, Vol. 64, No. 697 (1960)	61
(61) G. Wittmer: Ulteriori dati sulla mutabilità poligenica indotta da raggi X in Nicotiana Tabacum L. (Further results concerning X-ray induced polygenic mutability in Nicotiana Tabacum L.). Il Tabacco, Vol. 65, No. 700 (1961)	61
(62) G. Wittmer: Nuovi dati sulla mutabilità poligenica indotta nel tabacco (New results concerning induced polygenic mutability in tobacco). Il Tabacco, Vol. 65, No. 701 (1961)	61
(63) C. Liébecq and P.M. Osterrieth: Modification de la radiosensibilité de Escherichia freundii cultivée en présence de fluoroacétate (Modification of the radiosensitivity of Escherichia freundii cultivated in the presence of fluoroacetate). Archives Internationales de Physiologie et de Biochimie, Vol. 70, p. 125 (1962)	15
(64) F. Escobar del Rey and G. Morreale de Escobar: The Effect of Butyl-4-Hydroxy-3:5-Diiodobenzoate on the Availability of Thyroid Hormones to Peripheral Tissues in Isotopically Equilibrated Rats. Acta Endocrinologica, Vol. 40, p. 1 (1962)	85
(65) J.Z. Beer, S. Niewiarowski, O. Rosiek and E. Kowalski: Dysproteinaemia After Injection of ^{131}I-labelled Fibrinogen into Dogs. Bulletin de l'Académie Polonaise des Sciences Cl. II, Vol. IX, p. 109 (1961)	42
(66) B. Lipiński and E. Kowalski: Isolation and Purification of a Glycoprotein Fraction from Fibrinogen Digested by Plasmin. Report No. 252/X, Polish Academy of Sciences, Institute of Nuclear Research, Warsaw, 5 p. (1961)	42
(67) N. Stagni, G.L. Sottocasa, R. Cremese and B. de Bernard: Studi sulle idrolasi acide del miocardio di bue. Nota I. Attività beta-glicuronidasica, fosfatasica acida e proteolitica associate ai sarcosomi (Studies on acid hydrolases in beef heart muscle. I. Beta-glucoronidase, acid phosphatase and catheptic activities associated to sarcosomes). Giornale di Biochimica, Vol. X, p. 530 (1961)	69
(68) G.L. Sottocasa, N. Stagni, R. Cremese and G. Giudici: Studi sulle idrolasi acide del miocardio di bue. Nota II. Il comportamento delle catepsine e della beta-glicuronidasi associate ai sarcosomi di cuore di fronte a concentrazioni crescenti di Triton X-100 (Studies on acid hydrolases in beef heart muscle. II. Activation curve of beta-glucoronidase and cathepsins in sarcosomes treated with increasing concentrations of Triton X-100). Giornale di Biochimica, Vol. X, p. 538 (1961)	69

Publication	Contract number[a]
(69) S. Minc and Z. P. Zagórski: A Device for Optical Measurements During Gamma-Irradiation of Fluids. Nature, Vol. 193, p. 1290 (1962)	43
(70) E. Cerrai, L. Pelati, B. Schreiber and C. Triulzi: Misure di radioattività di campioni di zooplancton del Mare Adriatico e del Mar Ligure pescati fra il maggio 1961 ed il gennaio 1962 (Radioactivity measurements of samples of zooplancton collected in the Adriatic and in the Ligurian Seas in the period May 1961 - January 1962). Energia Nucleare, Vol. 9, p. 173 (1962)	62
(71) P. Wenger and D. Cassimatis: Recherches sur l'accumulation et la toxicité du radium et du radiostrontium dans le corps humain. I. Détermination du strontium-90 dans quelques cas de personnes contaminées (Research on the accumulation and toxicity of radium and radiostrontium in the human body. I. The determination of strontium-90 in several cases of contamination). Helvetica Chimica Acta, Vol. 45, p. 783 (1962)	38
(72) J.-L. Binet, G. Mathé, G. Seman, L. Kinsky and J.-L Amiel: Aspects morphologiques des cellules "immunologiquement compétentes" au cours des réactions de greffes allogéniques (Morphological aspects of "immunologically competent" cells during reactions of allogenic grafts). Nouvelle Revue Française d'Hématologie, Vol. 1, p. 887 (1961)	93

a/ For the exact titles of the contracts, see documents GC(IV)/114, Annex XIII, and GC(V)/154, Annex XIV.

b/ The numbers in parentheses indicate the order in which the Agency has been notified of the publication of papers in scientific journals (see document GC(V)/154, Annex XV, for references to earlier papers published).