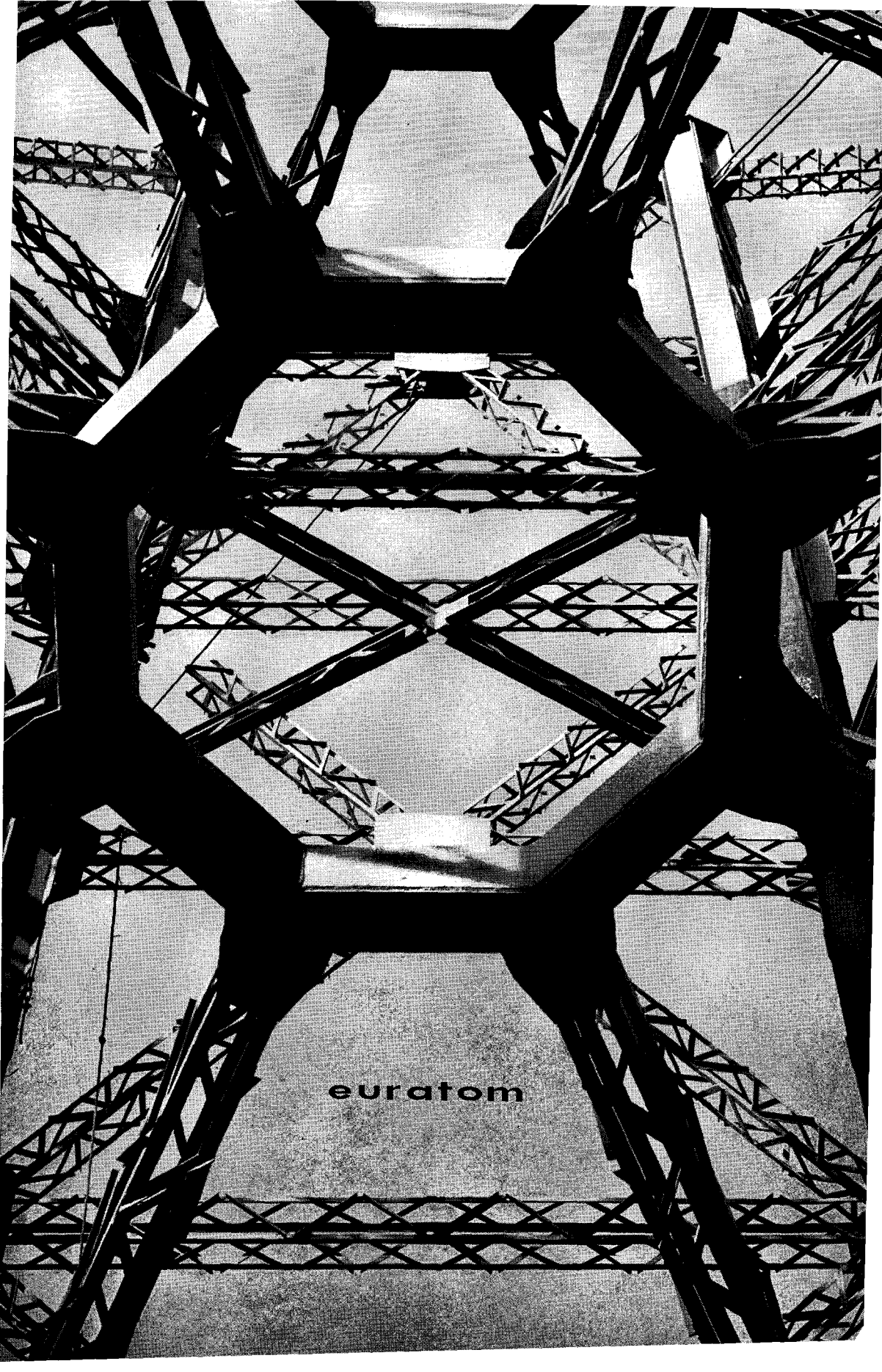
euratom

a year of activity

april 1962 april 1963

Based on the 6th General Report
of the Commission of the
European Atomic Energy Community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SUMMARY OF EURATOM RESEARCH BUDGET 1963-1967

SUBJECT OF RESEARCH		AMOUNT $ million
REACTORS and associated research	"Proven" reactors and their industrial development	29,5
	High temperature gas reactors	25
	ORGEL	57
	Fast reactors	73
	New reactor types	9
	Ship propulsion	7,5
	Operation of BR2 (Belgian) materials test reactor	12
	Treatment of irradiated fuel	14
	Treatment of radioactive waste	5
FUSION	Thermonuclear fusion studies	31
RADIATION	Radioisotopes	5
	Health protection and biological research	17,5
JOINT RESEARCH CENTRES	Ispra	72
	Petten	19
	Geel	11
	Karlsruhe	25
TRAINING		3
DISSEMINATION OF INFORMATION		9,5
	Grand Total	425

EURATOM 1962

Euratom has entered its sixth year of activity. The year constitutes an important step forward for the Community. Three points in particular stand out.

I. According to forecasts made, not only by Euratom, in liaison with the EEC and the ECSC, but also by such countries as the USA, nuclear power can now be produced economically in certain regions. It will be generally competitive before 1970. For this reason, the pace of industrial activity should be accelerated and Euratom has developed and reinforced its activities. Moreover, in view of the considerable increase foreseen in Europe's power requirements, nuclear energy will have a complementary character in the foreseeable future.

II. In order to help the European nuclear industry to achieve the necessary "state of readiness", a large part of Euratom's effort must still be devoted to research and the putting of "know-how" and research information at the disposition of the Community.

During the year 1962 the Euratom Second Five-Year Research Programme (1963-1967) was finalised, being approved by the Council of Ministers in June.

This programme involves a virtual doubling of the expenditure on research compared with the 1958-1962 period.

Half Euratom's research will be performed at the four establishments of the Joint Research Centre (Ispra, Petten, Geel and Karlsruhe), and half under contracts with private or public organisations or universities in the member countries. Under this programme Euratom will co-ordinate and complement the national programmes and bring about a state of nuclear interdependence in the Community.

III. The requests for membership by third countries are a token of the interest which Euratom is arousing, in view of its great future potential, outside the Community. As regards the application of the UK for membership of the Community, the Commission regrets the interruption to the negotiations begun in July, 1962. Nevertheless, it considers that the work accomplished during the negotiations should permit the intensification of the collaboration embarked upon with the UK in 1959.

Ispra Joint Research Centre establishment: one of the buildings under construction in 1962; it will house the ECO (Orgel critical experiment) reactor.

PRINCIPAL ACTIVITIES OF THE COMMUNITY IN 1962

— Drafting, finalisation and approval of the Commission 2nd Five-Year Research Programme.

— Placing of 133 research contracts, signing of 6 major association contracts.

— Around 2,000 research staff at work in the Joint Research Centre establishments and under contract.

— Further progress with the setting-up of the Joint Research Centre establishments.

— Transfer of the Petten Centre (Netherlands) to the Community.

— Construction of the ECO critical experiment and the decision to construct the ESSOR test reactor under the ORGEL Programme.

— Extension of the DRAGON Agreement.
— Groundwork for association with the Jülich Centre (pebble-bed reactor).

} Co-ordination of Community high-temperature gas reactor programme.

— Stepping-up of Community fast reactor research efforts (association with "Rapsodie" at Cadarache, 3 other associations being prepared).

— Mobilisation of plutonium research efforts.

— New long-term energy forecasts.

— Three projects added to the Community's power reactor construction programme—SENA (Franco-Belgian), KRB (German Federal Republic) and SEP (Dutch).

— A start to the construction of the Franco-Belgian SENA project at Chooz (Ardennes).

— Further evidence that nuclear electricity will "arrive" around 1967-1968.

— Signing of the Supplementary Convention on nuclear insurance.

— Nuclear ship propulsion research continues.

— Eurisotop Bureau set up to provide information on the development and industrial application of radioisotopes.

— Directive published on the free movement of qualified nuclear workers.

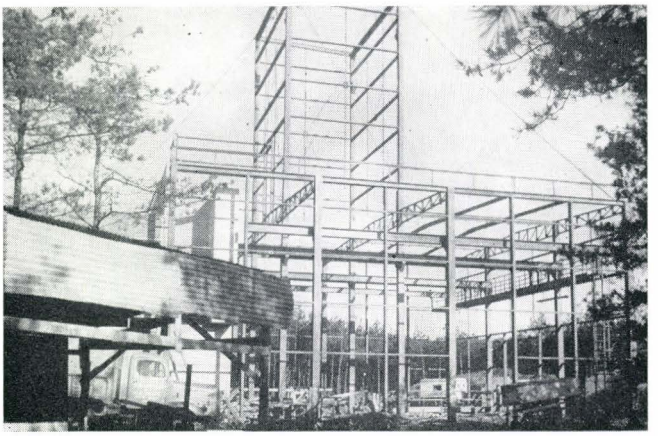
— 106 inventions patented in 1962 and 106 scientific and technical reports submitted.

— Progress in the application by the Member States and the bringing up to date of the Basic Standards for health protection.

— Development of co-operation agreements with non-member countries.

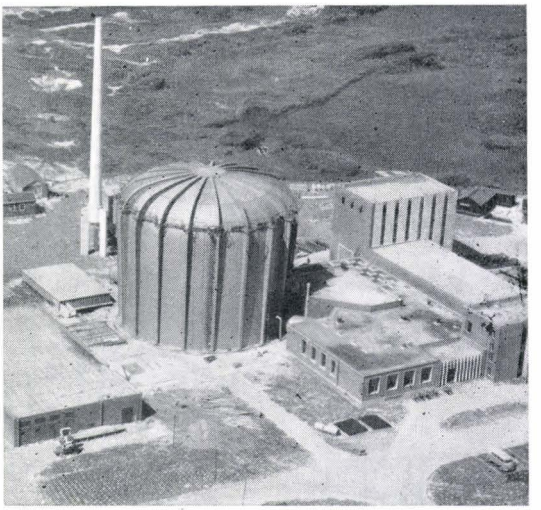
— Amendments to the US/Euratom Agreement and signing of Co-operation Agreement with Argentina.

— 7 more countries accredited diplomatic missions to the Commission.

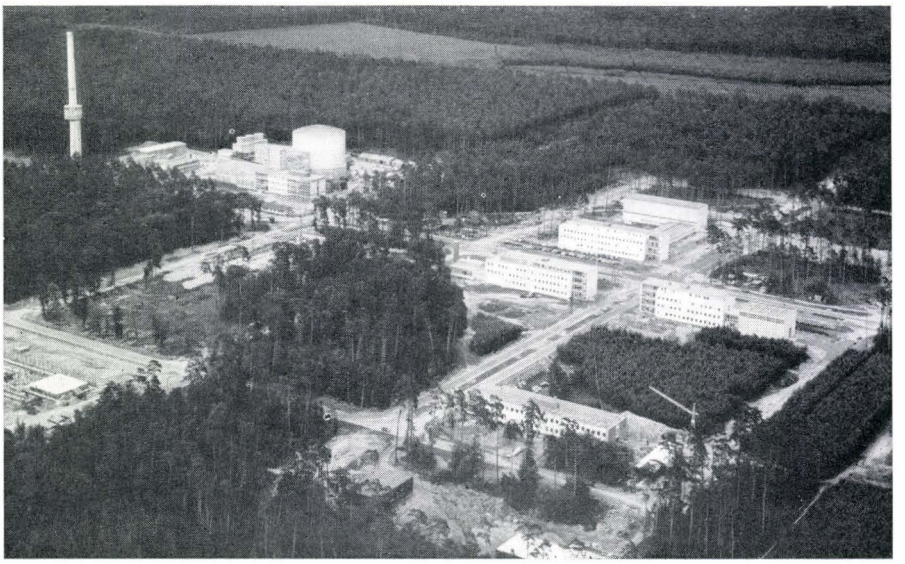


Geel establishment (near Mol) - Central Nuclear Measurements Bureau. ←

Petten establishment (80 km from Amsterdam) - View of high-flux reactor and auxiliary laboratories. →



To the left of the Karlsruhe Research Centre can be seen the site on which the European Transuranium Institute is being built. ↓



RESEARCH AND TRAINING

The outstanding activity in 1962 was the preparation of the Community's **Second Five-Year Research and Training Programme.** This was, in fact, the last year of implementation of the initial programme outlined in an Annexe to the Treaty, for which the Commission had at its disposal :

— a credit of $ 215 million;

— contributions in cash or in kind to the value of $ 31 million.

Almost the whole of the $ 215 million credit was appropriated during the period 1958-1962. One of the principal aims in the **first period** was to set about co-ordinating the various national nuclear programmes. In addition, a number of measures were taken to fill gaps in the field of research, accelerate other research projects or give additional backing to projects of proportions exceeding the resources of any one country. Finally, the Commission, at the request of the Member States, acted on their behalf in certain large-scale undertakings in a wider European context.

Under the new Five-Year Programme, which was approved in 1962, Euratom has a credit of $ 425 million [1]. This amount will enable the Commission to proceed with work already in hand and to extend its activity to several hitherto unexplored fields.

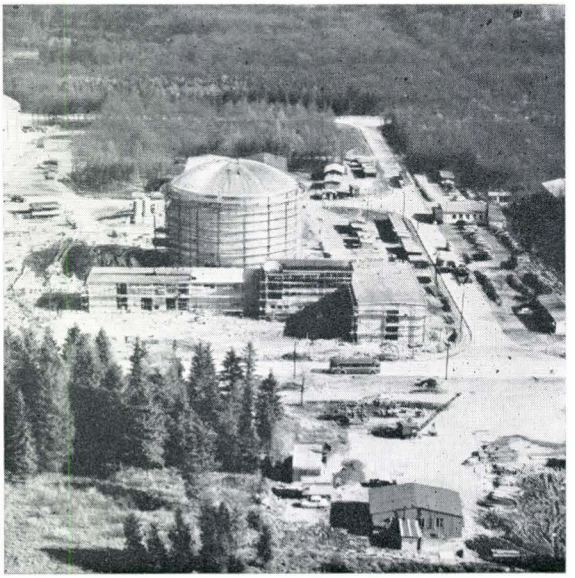
In 1962, a substantial portion of the credits utilised was devoted to the expansion of the **Joint Nuclear Research Centre. The Ispra** (Italy) establishment increased its staff to 1,250. A $ 9 million construction programme—financed, under the terms of the Agreement under which the establishment was set up by the Italian authorities—was virtually completed. It is being supplemented by a Euratom-financed programme the main feature of which is the construction of a critical experiment (zero-power reactor, ECO), which has been completed, and various laboratories. Preparatory work has also been started on the construction of a heavy water-moderated test reactor (ESSOR). These two reactors will be used for research and experiments on heavy water-moderated and organic liquid-cooled reactors, the development of which is one of the main objects of the Ispra establishment.

The **Petten** (Netherlands) establishment was formally set up by the transfer from the Dutch authorities to the Community of a high-flux materials testing reactor (HFR) and a site on which laboratories are shortly to be erected. These laboratories, work on which will start in 1963 or 1964, will be provided with equipment for the analysis of the results of samplings of materials irradiated in the HFR reactor. Besides the industrial-scale operation of this reactor, the Petten team will engage in research, in particular into the problems posed by advanced reactor types. Through agreements with several national centres, research has started in this field prior to the construction of the laboratory.

At **Karlsruhe** (Germany), work has begun on the construction of the building which will house the European Transuranium Institute. Its principal activity will be the study of plutonium as a fuel in nuclear reactors. This programme, vital to the future of nuclear energy, will cover

[1] Nearly $ 450 million, with the inclusion of the unused balance from the first programme.

BR 2 high-flux materials testing reactor - operated jointly at Mol by the Belgian Centre (CEN) and Euratom.



Research reactor of the Jülich (Germany) laboratory, where research is being carried out into controlled thermonuclear fusion (as at Fontenay, Frascati, Garching and Jutphaas).

a wide range of operations from the study of the element's properties to the fabrication of prototype fuel elements by laboratory methods. The Karlsruhe Institute will thus become the mainspring of plutonium research in the Community, and as such it may be expected in particular to further the work undertaken by the Commission and its associates on the development of fast neutron reactors, for which plutonium is an eminently suitable fuel. Part of the establishment's activity will be devoted to the study of transplutonium elements (which have a higher atomic weight than plutonium elements); as yet little is known about their properties and still less about their applications.

At **Geel** (Belgium) the Central Nuclear Measurements Bureau has received further equipment, through the installation, notably, of a van de Graaff accelerator and the construction of auxiliary laboratories. Work has also been started on the installation of a linear accelerator, which should be ready in the near future.

In addition to the sums set aside for the equipment and operation of the Joint Research Centre establishments, the Commission entered into commitments last year for expenditure in connection with research and association contracts with public or private research centres in the Community. As will be seen from the accompanying table, 6 new association contracts have been signed, as well as 133 research contracts, involving an overall expenditure in the region of that appropriated for the Joint Research Centre.

The Aims

DEVELOPMENT OF POWER REACTORS

As in the past, research and development work has been concentrated on the most promising reactors for the production of electricity. These reactor types include, in particular, fast neutron reactors, high temperature gas reactors, natural or slightly enriched uranium reactors and "proven" water reactors.

— **Fast reactors** can produce from a fertile material more nuclear fuel than is consumed by the reactor. They can also employ efficiently the plutonium which present-day thermal reactors produce in large quantities. Fast reactor research therefore has a leading place in the second five-year programme. $ 73 million is allocated to this sector, this being the largest item of expenditure in the programme. This research will be carried out almost entirely under association contracts with national projects, the Commission bearing on average one third of the expenditure.

A first association contract was concluded in 1962 with the French Atomic Energy Commission for the study, construction and operation at Cadarache of an experimental reactor, "Rapsodie". Three other such contracts are to be signed in the near future with the German Federal Republic, France and Italy. This network of associations will permit the co-ordination of all research in this field undertaken in Europe and will promote the launching of active co-operation with the United States and the United Kingdom.

— **High-temperature gas reactors** represent an improvement on the natural uranium graphite-carbon dioxide reactor, the first industrial scale units of which were recently constructed in both France and the United Kingdom. The performance of these reactors can be appreciably increased by improvements in "burn-up" and other ways. The Commission's efforts are being concentrated on projects which, owing to a cheaper fuel cycle and a high specific power, hold out prospects of a reduction in investment costs.

Since 1959 Euratom has been participating in the OECD "Dragon" project in the UK.

EURATOM'S CONTRACTS OF ASSOCIATION

1959

— Contract with the French Atomic Energy Commission for **controlled nuclear fusion research.**

— Contract with the Dutch Institute TNO for **radiobiological research.**

— Contract with the Dutch firm KEMA for the study of a **homogeneous suspension reactor.**

1960

— Contract with the Italian Nuclear Energy Committee (CNEN) for **fusion** research (Frascati).

— A further contract with the Belgian Nuclear Energy Study Centre for the joint operation for 20 years of the **high-flux materials testing** reactor BR 2 (Mol).

1961

— Contract with the Max Planck Institute (Munich) on **thermonuclear fusion.**

— Six contracts, with the University of Liège, the Free University of Brussels, the Pasteur Institute (Paris), the French National Agronomical Research Institute, the Belgian Nuclear Energy Study Centre and the Dutch ITAL Institute respectively, in the fields of **biology and radiobiology** (effects of radiation on living organisms, preservation of foodstuffs by irradiation, etc.).

— A contract under which Euratom is associated with the Italian Nuclear Energy Committee and the Free University of Brussels covering **isotopic geology.**

1962

Body or Firm	Period	Subject
French Atomic Energy Commission (CEA)	5 years	Study, construction and operation of "Rapsodie" fast neutron reactor
CEA	3 years	Controlled nuclear fusion research
CNEN	3 years	
Jülich Research Centre	3 years	
FOM (Netherlands)	3 years	
Naples Institute of Genetics and Biophysics	5 years	Research in the field of genetics and biophysics

This project aims at assessing the future of high temperature, graphite-moderated carbon dioxide-cooled reactors. In 1962, the "Dragon" agreement was extended for three years. The Commission will continue to play a full rôle in this reactor experiment and the results of the research will be distributed in the Community.

Negotiations have been initiated with the German authorities for Euratom association with a research and construction programme in the field of high-temperature reactors using thorium as fuel.

— **Organic liquid-cooled, heavy water-moderated reactors** have since 1959 been the subject of a large-scale research and development programme initiated by Euratom. This, the ORGEL programme, is being largely carried out at Ispra. This project has been chosen in view of the fact that only natural uranium reactors can ensure the Community's independence regarding fuel supplies. Moreover, the use of non-enriched uranium should make it possible to keep the fuel-cycle cost fairly low. Finally, low-pressure operation, the exploitation of proven techniques, and the use of relatively cheap materials justify hopes of lower investment costs.

Apart from the work at Ispra, part of the ORGEL research is being carried out under contract in national laboratories (25 new contracts in 1962).

The principal items of equipment for the ORGEL project are a critical assembly (ECO), whose construction is now complete, and a specific test reactor (ESSOR), which is expected to go critical in 1966.

— As regards "**proven**" **water-moderated and cooled reactors,** research is taking place under the US-Euratom Co-operation Agreement, research contracts being placed both in the Community and in the USA. The aim is to improve the performance of these reactors, the studies relating in particular to ceramic fuels, the manufacture of fuel elements, plutonium recycling and thermodynamic and hydrodynamic problems (the aim being to improve on the efficiency of heat extraction from the reactor). Altogether $ 27 million has so far been engaged for the joint Research and Development programme, of which $ 17 million for contracts in the Community and $ 10 million for those in the U.S.A.

— Research is also underway for the development of a **homogeneous reactor** in which the fuel is mixed and circulates with the coolant, the development of a reactor cooled by a **water/steam** mixture ("fog" reactor) and the operation of the OECD's Halden **boiling heavy-water** reactor in Norway.

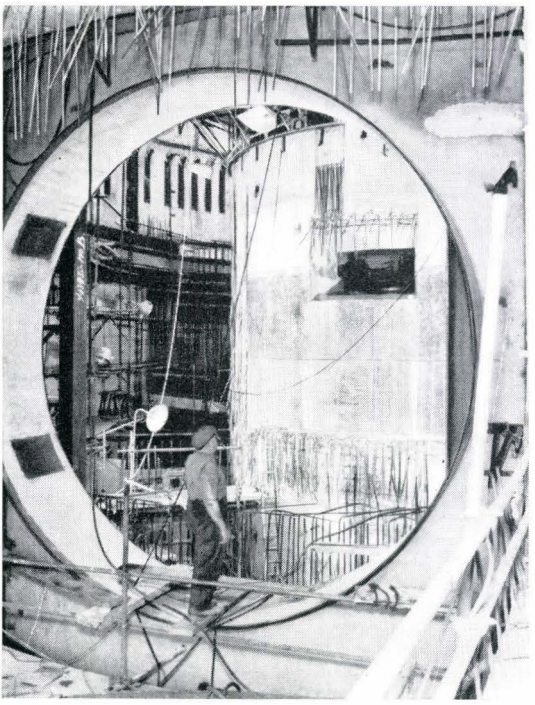
HIGH-FLUX MATERIALS TESTING REACTORS

The transfer to Euratom of the Petten reactor raises to two the number of HFR's operated by the Community. The first, the Belgian BR 2 at Mol, Belgium, has entered into service under a Euratom-CEN association contract.

THERMONUCLEAR FUSION

Scientists in many parts of the world are grappling with the difficult but eminently worthwhile task of harnessing the thermonuclear fusion process—fusion of the light-atom nuclei, which is accompanied by a great release of energy and for which the only basic material is water, available in almost limitless quantities. But such are the difficulties being encountered that it will be many years before the fusion process can be used for producing electricity.

Critical mock-up of the fast neutron experimental reactor in the Rapsodie testing shop at Cadarache.



Work in progress during the construction of the core vessel for the Dragon reactor, a joint project which is being carried out by OECD countries, with Euratom representing the Member States.

Nevertheless, Euratom is engaged here in a line of research holding great promise over the long term.

During 1962 two new association contracts were concluded with laboratories in Germany (Jülich) and the Netherlands (Jutphaas). In addition, the existing association contracts (Fontenay-aux-Roses, Frascati and Munich) have been extended. Through these association contracts, Euratom is participating in all fusion research in the European Community.

BIOLOGY

The Commission's biological research is directed towards achieving a better understanding of the effects of radiation on living organisms, and in particular on man, the aims being to eliminate all risks of contamination in nuclear installations and to facilitate the prevention, diagnosis and treatment of lesions due to radition.

Prompted by a recent clinical observation at Euratom, research under contract has been initiated into the major problem of the radionecroses. Other contracts have been concluded with specialised university laboratories and institutes in the Community, notably for the study of genetic anomalies liable to be caused by radiation and the development of chemical substances for radiation protection. Another important sector for research has been the application of nuclear techniques to agriculture.

AUTOMATIC CALCULATION AND DOCUMENTATION

The powerful electronic brains at Ispra have played an important part in the complex calculations needed for the development and perfection of nuclear reactors. These machines can also be employed for automatic translations. In 1962, work was concentrated on the development of the French/German translation combination and on the utilisation of Russian/English translation facilities elaborated in the United States.

RESEARCH AND TRAINING

Europe at present suffers from a dearth of research workers, and above all of qualified technicians, in the nuclear field. One way in which the Commission is working to remedy the situation is to place for limited periods trainees (students and graduate research workers) in its research establishments or in the national research centres. In 1962 students were admitted for the first time to the construction sites of nuclear power plants in which Euratom is participating.

At the beginning of 1963, the French Government proposed that a fifth Euratom research establishment be set up as a training centre for nuclear scientists and technicians.

INDUSTRY AND ECONOMY

OUTLOOK

The task common to all three European Communities is the promotion of the raising of production, the raising of living standards and the expansion of trade. In this, nuclear power is destined to play a leading part by assuring the availability of the power sources required to underpin an expanding economy.

In its Third General Report (April 1960), the Commission was already able to publish the initial results of its studies on the nuclear energy outlook. Since then, the data obtained and analysed in close co-operation with the EEC and the ECSC has permitted a more accurate assessment of the scientific, technical and industrial research programmes and of the measures needed to enable industry to adapt itself to the new nuclear context.

There are three reasons which warrant the development of nuclear energy in Europe :

— it is only nuclear power that will prevent the Community from becoming ever more dependent on external sources of energy;

— conventional sources of energy clearly will not suffice on the longer term to meet power requirements, which are expected to double every 20 years;

— the failure of industry to adapt itself to nuclear developments involves the risk of falling behind in a technological development which affects more sectors of industry than is generally suspected.

Although for the moment conventional sources can still meet the growing power needs, the day will come when they will be unable to do so. Industry must therefore adapt itself increasingly to the challenge of this complementary source of energy. Although in the immediate future it is the ability of nuclear energy to compete that will determine the date of the "breakthrough", nuclear energy is a long-term necessity.

As for the prospects for the nuclear "breakthrough" the Commission has stated (in reports to the European Parliament and the Economic and Social Committee) :
"Within three or four years, nuclear power plants will be remarkably efficient in areas in which coal costs between $ 12 and $ 16 a ton. This forecast is of some significance in view of the fact that the current price for European-Mined coal is $ 14-15 per ton."

The Commission goes on to say:

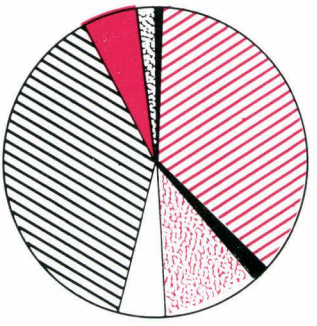
"In the coming years, nuclear energy will have far-reaching effects on the whole European power industry... It would be a great mistake to elaborate and then promote a coal or oil policy which took no account of nuclear energy's potential."

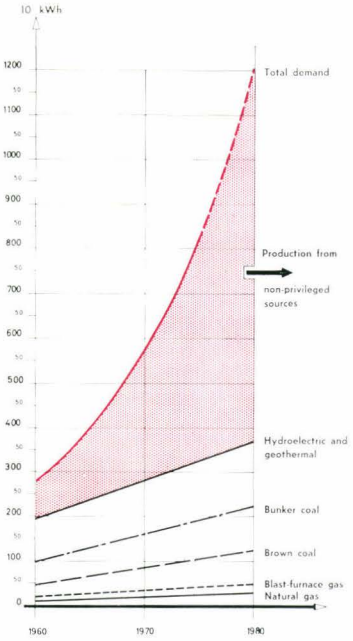
These statements are confirmed in "Study of the Long-Term Energy Prospects in the European Community", published in December 1962: "Nuclear power plants will already be competitive in several regions of the Community between 1965 and 1967 and will be so in the Community as a whole by 1968 or 1970 with a utilisation rate at or above 6,000 hours a year.

From around 1970, therefore, expansion of the use of nuclear energy will no longer be limited by production costs; the principal threat to this expansion will be the difficulties incurred by nuclear industries in maintaining an economically desirable rate of power plant construction. It is this obstacle that the Commission, in co-operation with the section of industry concerned, is endeavouring to remove."

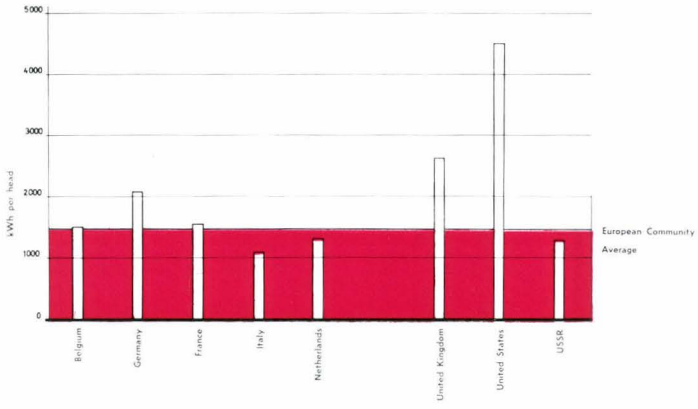
Breakdown of the production of electricity in the Community in 1961 according to primary sources used.

		10^9 Kwh	%
1	Hydroelectric	93,1	32,6
2	Geothermal and Nuclear	2,5	0,9
3	Brown Coal	32,6	11,4
4	Blast furnace gas	12,6	4,4
5	Coal	113,9	39,9
6	Oil	23,1	8,1
7	Natural gas	7,2	2,5
8	Others	0,6	0,2
9	Total	285,6	100,0





Probable evolution of the total electricity demand and production from privileged sources in 10^9 kWh.



PRODUCTION OF ELECTRICITY OF NUCLEAR ORIGIN

(in millions of kWh)

To date

1957	1958	1959	1960	1961	1962
1	4	41	130	266	500

Forecast

1965	1968	1970	1975
6/7,000	15/18,000	20/25,000	60/100,000

This table shows how the production of electricity from nuclear sources has evolved so far in the Community and how it is expected to develop during the period to 1975. This forecast provides industry with the means of making a reasonable assessment of the probable demands which the new technology is likely to make over the next decade or so.

The table on page 18 shows in detail how the installation of nuclear power stations is going alhead in the Community, and that by 1967 the total installed capacity will be over 2,500 MW, of which roughly one half in France.

Euratom is assisting the Community's nuclear industries in various ways:

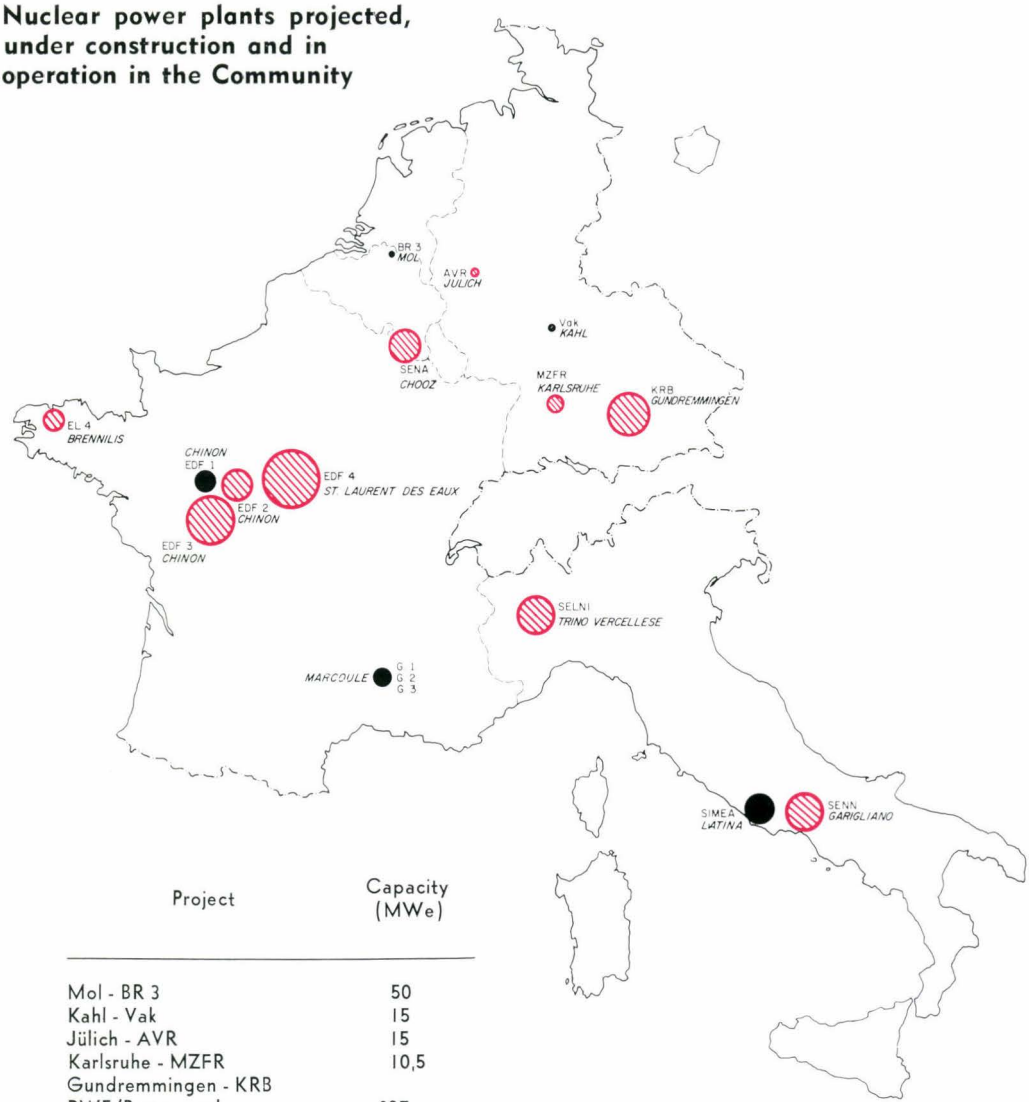
1. PARTICIPATION IN THE CONSTRUCTION AND OPERATION OF POWER REACTORS

Euratom is contributing or is to contribute $ 32 million to the constructional and start-up phases of five Community power reactor projects. In return for this financial aid, the Commission has access to all relevant "know-how", through both the seconding of staff to the project and the submission by the concern of technical reports. The Commission can make this information available to other interested parties in the Community. Participation contracts were signed in 1961 with the Italian SENN company for the allocation of $ 7 million to their boiling water reactor project and with the Italian SIMEA concern for a contribution of $ 4 million for the Latina gas-graphite reactor.

On 23 July, 1962, a third contract was signed with the Franco-Belgian SENA Company, which will receive $ 8 million towards their pressurised water reactor project at Chooz. It is also planned to participate in two further projects, those of the German KRB company and the Dutch SEP company ($ 8 million and $ 5 million respectively).

Under these contracts not only does Euratom allocate its own staff to the project but also engineers and technicians from private and public bodies in the Community. At present, some fifty engineers and technicians from 23 Euratom organisations, together with 8 Euratom

Nuclear power plants projected, under construction and in operation in the Community



Project	Capacity (MWe)
Mol - BR 3	50
Kahl - Vak	15
Jülich - AVR	15
Karlsruhe - MZFR	10,5
Gundremmingen - KRB	
RWE/Bayernwerk	237
Chooz - SENA	210-242
Marcoule	
G. 1	5
G. 2	37
G. 3	37
Chinon	
EDF 1	70
EDF 2	170-190
EDF 3	375-420
St-Laurent-des-Eaux - EDF 4	400-500
Brennilis - EL 4	80
Trino Vercellese - SELNI	257
Garigliano - SENN	150-230
Latina - SIMEA	200

The SEP project in Holland should be added, but the site is not yet known. Its capacity will be 50 MWe.

staff, are following the work being carried out on the first three power plants. They have submitted numerous reports, which the Euratom Commission has distributed in various ways, including the organisation of meetings with the plant constructors and operators and fuel-element fabricators. On returning to their own concerns, they will take with them valuable knowledge acquired on the reactor site.

2. DEVELOPMENT OF "PROVEN" REACTOR TYPES

A large number of research contracts have been placed aiming at improving fuel performance and effecting other improvements to the boiling and pressurized water type reactors, three of which are being installed in the Community under the terms of the US/Euratom Agreement. The fuel element fabrication contracts involve an outlay of $ 20 million.

Two further projects have been included in the US/Euratom Joint Power Programme in response to the second invitation issued by the Joint Reactor Board : one is the Franco-Belgian 210-242 MW SENA project, the other the German 237 MW KRB project. Among the benefits are moderate-interest loans of $ 16.25 million and $ 20 million respectively, plutonium re-purchase guarantees, the supply of enriched uranium and plutonium recycling facilities. In addition certain companies enjoy the joint enterprise status provided for by the Euratom Treaty. This status confers, in addition to the benefits already mentioned, certain taxation and customs privileges.

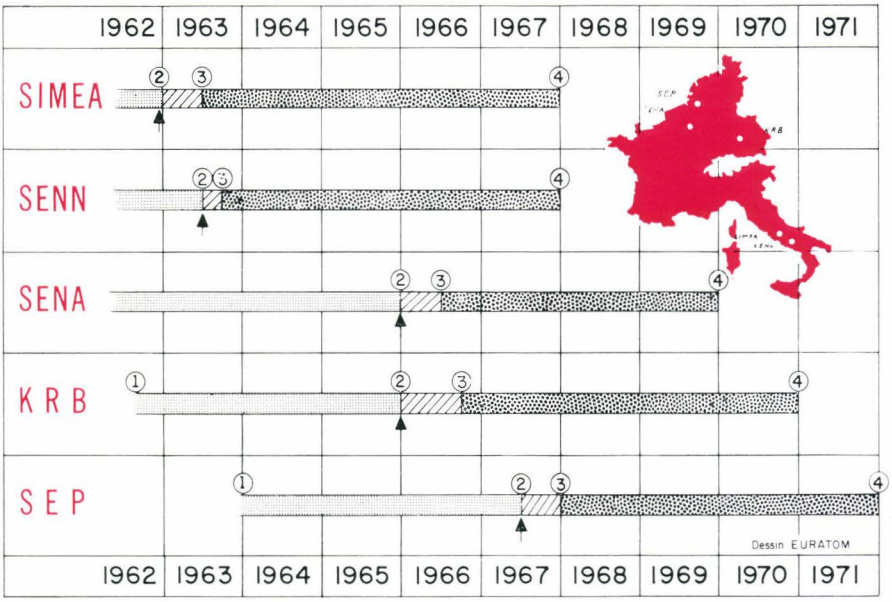
3. NUCLEAR SHIP PROPULSION

Research into nuclear ship propulsion is taking place under four association contracts, two in Germany, one in Holland and one in Italy. This work has been supplemented during 1962 by studies into the economic aspects of nuclear ship propulsion and into the problems raised by the entry of nuclear-powered cargo vessels (in particular the American "Savannah") into European ports.

4. SUPPLY

A large number of transactions for the supply of raw materials were concluded during the year between producers and users without the Agency's intervention, as is permitted by the Commission's regulations. The Supply Agency has, however, itself concluded a number of large-scale transactions for the supply of natural uranium. It has also concluded the first contracts under the US/Euratom Co-operation Agreement : these cover the supply of enriched uranium for the SENN reactor and the delivery of substantial quantities of highly enriched uranium to research centres in France and Italy. The Agency is now negotiating a contract

Euratom programme for participation in Community power reactor projects



(1) Start of work
(2) Criticiality
(3) Full power
(4) Expiry of participation contract

The Ardennes nuclear power plant (SENA) illustrates the table above. The photograph clearly shows the entrance to the galleries which will give access to the caverns housing the nuclear section of the plant.

with the United Kingdom Atomic Energy Authority for the supply of plutonium for the first core of the "Rapsodie" reactor, the subject of an association contract between the French Atomic Energy Commission and Euratom.

5. FREE MOVEMENT OF QUALIFIED NUCLEAR WORKERS

In addition to the common market for nuclear materials and equipment (in existence since January 1959), directives have been issued requiring governments to adopt an automatic procedure permitting qualified nuclear workers to accept posts in other member countries.

6. SUPPLEMENTARY INSURANCE CONVENTION

On 31 January, 1963, the Member States and other European countries signed a Supplementary Convention to the Paris Convention of 29 July, 1960. This additional convention raises to $ 70 million the sum for which governments must ensure that third party insurance coverage is provided, the signatory parties providing joint coverage for any additional amount up to a maximum of $ 120 million.

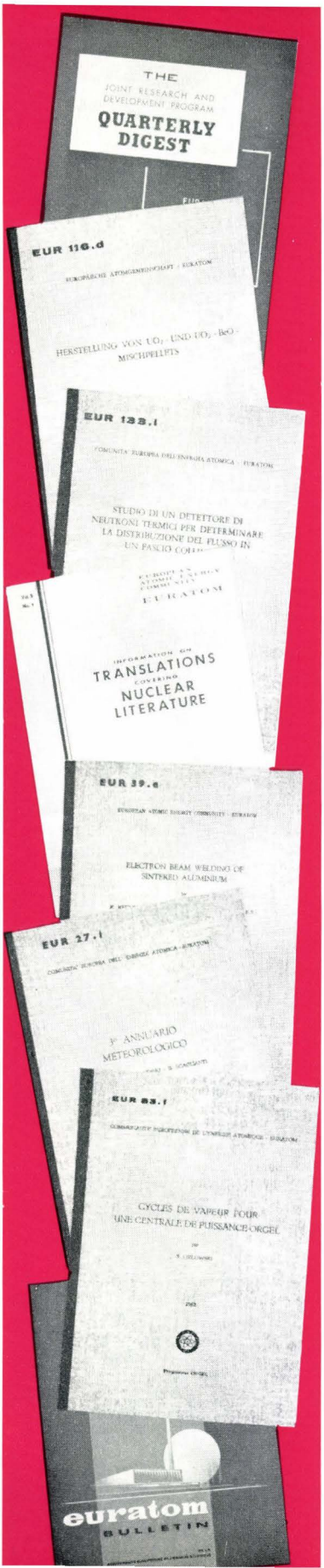
7. THE INDUSTRIAL USE OF RADIOISOTOPES

The "Eurisotop" Bureau set up in 1961, has been concerned during the year with

— the development of methods and equipment for the application of radioisotopes;

— information and data likely to be of use to interested organisations, enterprises and individuals;

— the co-ordination, in co-operation with isotope users, of the Community's activity in this field.



DISSEMINATION OF INFORMATION

I. Activity of the "Information and Documentation Centre" (IDC)

1. The Information and Documentation Centre (IDC), which was set up in 1961, is responsible for documentation, publications and libraries.

2. The "Documentation" Section's tasks increased considerably during 1962. To its two constituent groups, "Documentary Research" and "Documentary Analysis", was added a third, named "Documentary Sources". In order to satisfy the needs of both the various departments of the Commission and individuals and enterprises in the European Community, the IDC will towards the end of 1963 install an electronic computer, which will permit better utilisation of the activities of the Documentation Section, whose efforts are at present directed towards the preparation and feeding of its electronic memories.

3. In the application of the Commission dissemination of information policy, **106 scientific and technical reports were published in 1962.** The Transatom Bulletin, the Euratom Bulletin and the Quarterly Digest continued to appear regularly. While the Transatom Bulletin and the Quarterly Digest are reference periodicals, the Euratom Bulletin provides articles on the technical aspects of the Commission's activity to a non-specialised public. Another periodical, "Euratom Information", appearing every two months, provides more frequent and systematic information for scientific and technical experts. The Commission is also expanding its library services. The Brussels library, which had already been entrusted with the task of building up the CNMB's library at Geel, is now preparing the setting up of two further libraries at the Karlsruhe and Petten establishments.

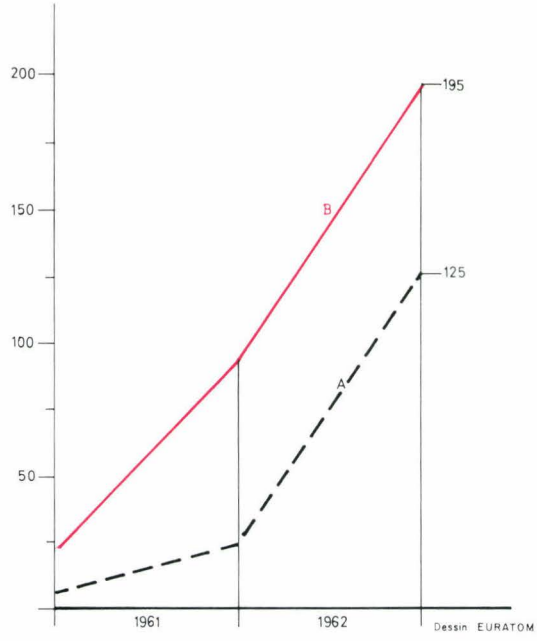
Some examples of Euratom publications.

II. Activity of the industrial property division

The expansion of the number of patents in the Community has gone ahead at an increased rate. The breakdown of patented inventions at the end of 1962 was :

JRC establishments	57
Association contracts	50
Other contracts	32
Dragon	54
Miscellaneous	2

Scientific and technical reports published by Euratom and patent applications filed by Euratom



- - - scientific and technical reports
—— patent applications

The Scientific Data Processing Centre at Ispra to-day possesses substantial equipment for both analogue and digital computer work. The photograph shows a mathematician beside a PACE 231 R analogue computer.

Several of these inventions are being used at laboratory level and their industrial exploitation is being actively studied.

The Euratom Commission has participated, along with the EEC Commission, in the work undertaken by the six Community countries for the creation of European industrial property rights.

THE COMMUNITY'S EXTERNAL RELATIONS

The increasing interest of third countries in Euratom's development was well illustrated during 1962 by the British and Danish applications for membership. Co-operation between the **United Kingdom** and Euratom was already making good progress under the UK/Euratom Co-operation Agreement of 1959, notably as regards thermonuclear fusion, fuel reprocessing, the supply of fissile materials and fast reactors.

The negotiations for British membership of Euratom, which started in July 1962, further emphasized the importance of the mutual advantages which would have resulted from a successful outcome and the reciprocal benefits which closer co-operation between the UK and the Community would have brought about. Nevertheless the work during the negotiations was not in vain. It has been made clear that closer co-operation would be in the interest of both parties. Indeed, the credit side of the results of these negotiations is likely to be reflected in a strengthening of the collaboration already embarked upon.

Further progress under the 1959 Agreement for Co-operation between Euratom and the **United States** was made in 1962. Fissile materials for research and power reactors outside the scope of the US/Euratom Agreement may now be made available to the Community from the quantity earmarked for the Joint Programme. These amendments, signed in July, also permit the re-export of US-supplied fissile materials in a fabricated form to non-member countries with which the United States has co-operation agreements.

Co-operation continued under the **Canada**-Euratom Co-operation Agreement and consultations on a "triangular" basis took place between Euratom, Canada and the USA on organic reactor projects.

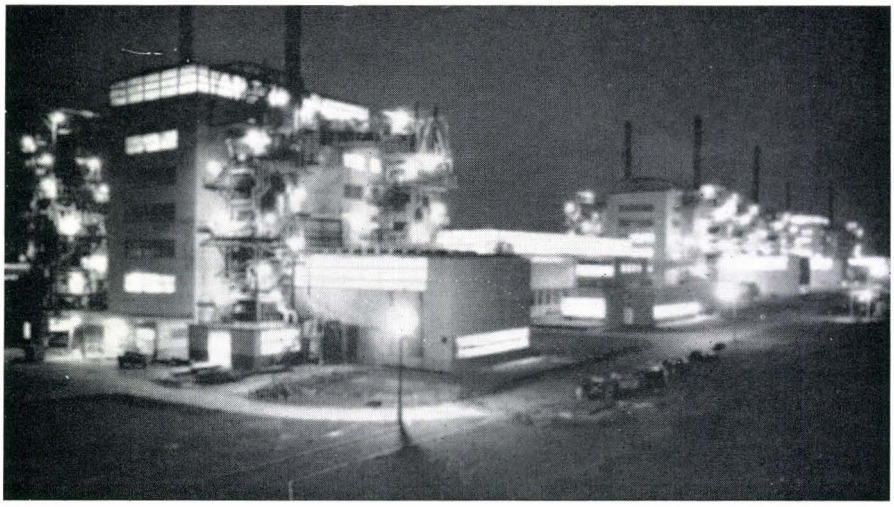
A co-operation agreement was signed with **Argentina**, while, in implementation of the 1961 Agreement for Co-operation with **Brazil**, exchanges and training specialists were initiated.

THE COMMUNITY'S EXTERNAL RELATIONS

Following the Commission's visit to **Japan** in 1961, the Japanese authorities proposed that the two sides co-operate by exchanging information. The proposals were the subject of discussion during a visit by members of the Japanese Atomic Energy Commission to Brussels, Mol and Ispra. Among other noteworthy official visits were one from the President of the Greek Atomic Energy Commission and one by the Euratom Commission to Sweden.

The Commission has given particular attention to the furtherance of relations with the newly-developing countries. On various occasions, the independent African countries and Madagascar, which are associated in the OAMCE (Afro-Malagasy Organisation for Economic Co-operation), have shown interest in the technical advice which the Community can offer. Seven further countries, Ivory Coast, Portugal, Spain, Australia, Greece, Republic of Ireland and Upper Volta, have **accredited missions** to Euratom, bringing the total to 18.

Euratom developed its relations with the **international organisations.** The Community's participation in the OECD Dragon and Halden Agreements was renewed for additional periods by the three-year and eighteen month extensions to these Agreements. Contacts with the International Labour Organisation (ILO), the World Health Organisation (WHO) and the Council of Europe have also continued.



The Atom : World Source of Energy.

HEALTH PROTECTION

Euratom is helping to ensure that adequate protection against radiation dangers is provided for by supervising the application of the Basic Health Standards, laid down in 1959, in the six Member States; the Commission is also co-ordinating and publishing the results of background radioactivity measurements carried out in Community territory and giving opinions on projects for the disposal of radioactive waste.

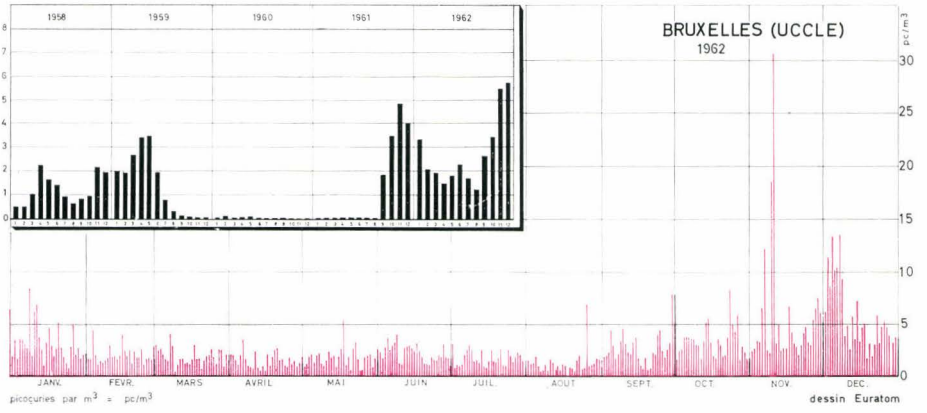
Basic Health Standards and the Harmonisation of National Legislation

— A number of Community countries have adopted the Basic Health Standards.

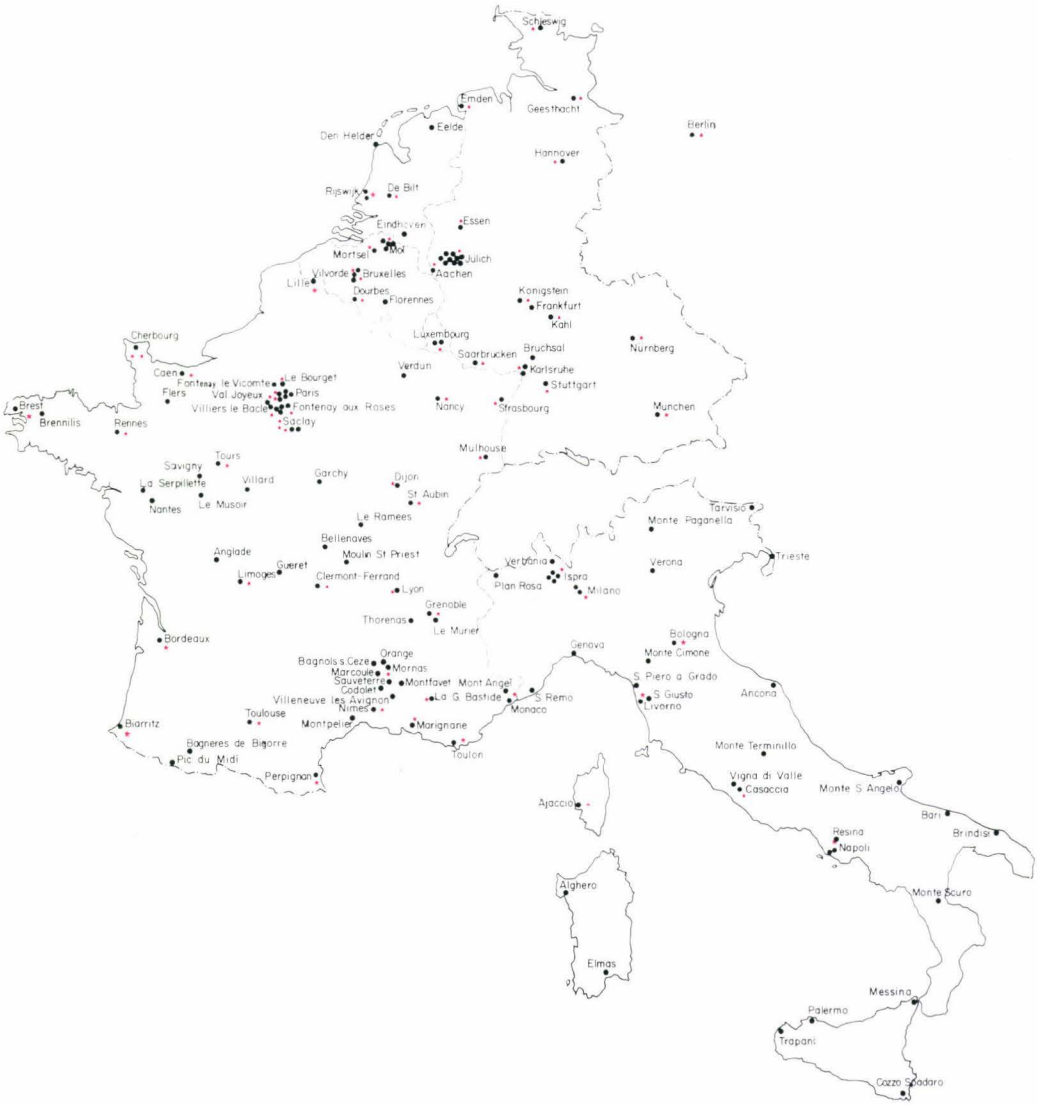
— Others have embarked on the procedure for their enforcement. France, Belgium and Holland submitted draft texts to the Commission during 1962.

— The Commission has also modified the Standards in the light of the latest scientific information.

Table of radioactive fall-out measured in 1962 at Brussels (Uccle); references to the previous years.



Map of the stations for measuring and sampling artificial atmospheric radioactivity at ground level supplying information to the EURATOM Commission



• Sampling stations

* Measuring stations.

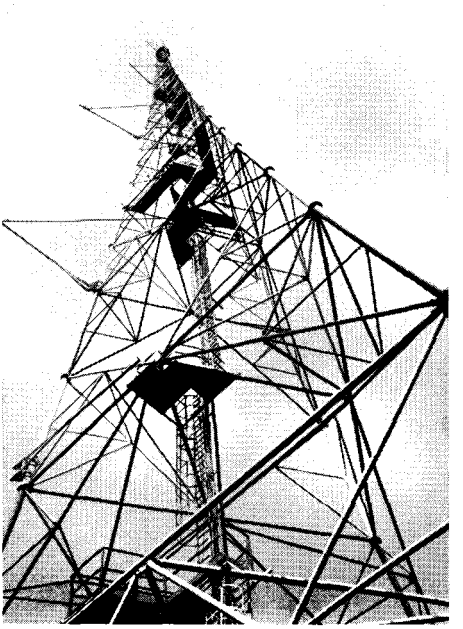
Control of background radioactivity - Medical and health problems and the security of nuclear installations

The results for 146 posts for the sampling of radioactivity in the air, 143 posts for sampling fall-out and precipitation, 65 posts for measuring radioactivity in the air and 34 posts for measuring fall-out and precipitation are sent to Euratom at regular intervals.

The Commission has embarked upon studies designed to bring about a standardisation of the methods for measuring radioactivity in the air, water and soil throughout the territory of the Community, and in particular those relating to radioactivity in river basins, for which lines of action have been worked out and put into operation. A first systematic study has been undertaken jointly over the entire Rhine basin.

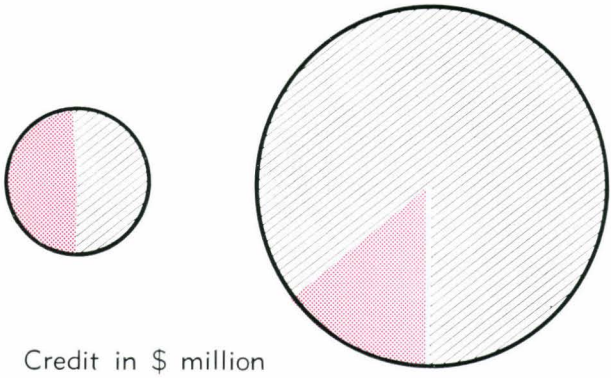
As for the problems of radiation, medicine and hygiene, an investigation is being conducted into the monitoring of the level of contamination in the alimentary canal.

Finally, the Member States, as in the past, have been submitting new radioactive waste disposal projects to Euratom for the Commission's opinion.



Meteorological tower at Ispra for measuring radioactivity.

BUDGET AND ADMINISTRATION



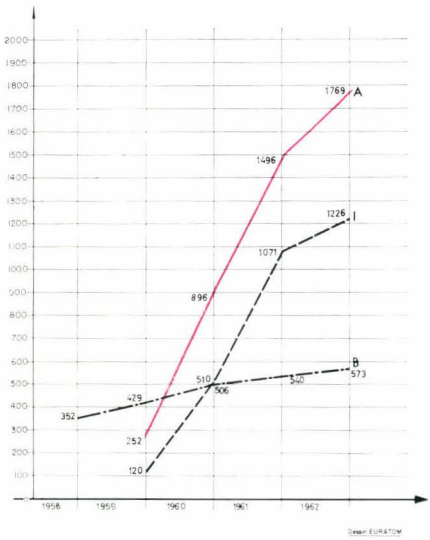
Credit in $ million

1958
9 838 696

1962
82 468 641

Administration

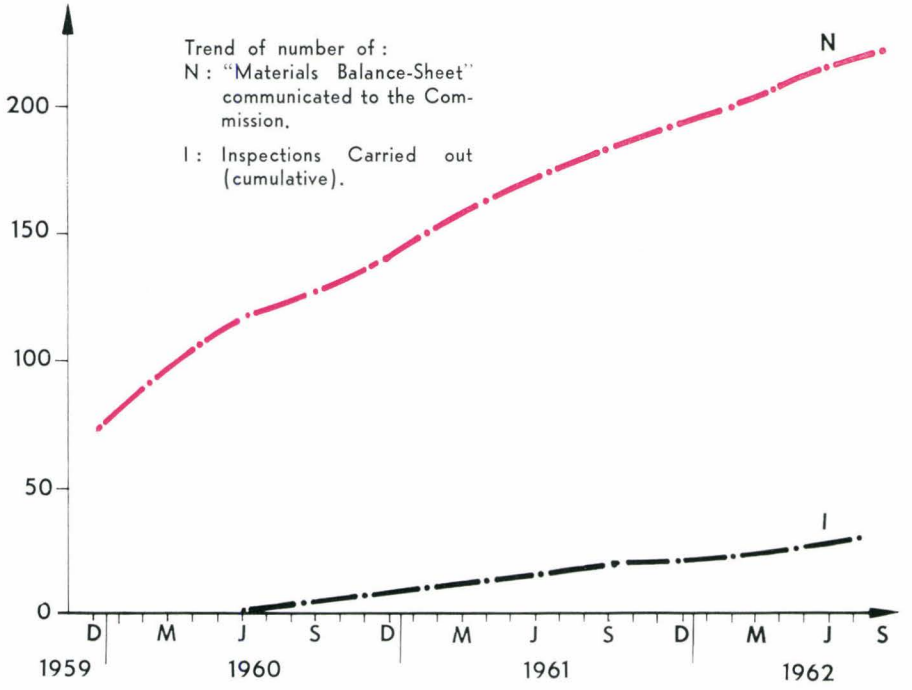
Research



Staff breakdown under the Research Budget (A), including staff at the Ispra Establishment (I), and under the Operating Budget (B).

SECURITY CONTROLS

92 plants have submitted the declarations to the Commission, 131 have sent in returns of their stocks of raw and fissile materials. The Commission have carried out inspections of 34 installations, 20 research and 14 industrial.



OTHER INFORMATION

List of the Principal Items Published in the "Journal Officiel" of the European Communities

30 April — Financial Regulation on the Methods and Procedure whereby the Member States' Contributions referred to in Art. 172, para. II of the Treaty shall be made available to the Commission (Art. 183, section (b) of the Treaty).

12 May — The Community's Research Budget for 1962.

9 July — Directive on Free Access to Specialised Employment in the Nuclear Field.

— Directive governing the Revision of Annexes I and II to the Directives laying down the Basic Standards for Health Protection.

6 August — Community's Second Five-Year Research and Training Programme.

8 August — Amendment to the Agreement for Co-operation between the Government of the United States of America and Euratom of 8 November 1958.

— Amendment to the Annex dated 11 June 1960 to the Agreement for Co-operation between the Government of the United States and Euratom.

1 December — First List of the Research Activities Envisaged by the Commission under its Second Five-Year Research and Training Programme.

ABREVIATIONS USED

A.V.R.	Arbeitsgemeinschaft Versuchs-Reaktor G.m.b.H. (Deutschl.)
BR 2	Belgian Reactor (Belgique)
C.E.N.	Centre d'Etude de l'Energie Nucléaire (Belgique)
C.N.E.N.	Comitato Nazionale per l'Energia Nucleare (Italia)
C.N.M.B.	Central Nuclear Measurements Bureau (Geel - Belgium)
ECO	Expérience Critique Orgel (France)
EDF	Electricité De France (France)
EL 4	Eau Lourde (France)
ESSOR	Essai Orgel (France)
F.O.M.	Stichting voor Fundamenteel Onderzoek der Materie (Nederland)
H.F.R.	Hoge Flux Reactor (Nederland)
I.T.A.L.	Instituut voor Toepassing van Atoomenergie in de Landbouw (Nederland)
K.E.M.A.	N.V. tot Keuring van Electrotechnische Materialen (Nederland)
K.R.B.	Kernkraftwerk R.W.E. Bayernwerk G.m.b.H. (Deutschland)
M.Z.F.R.	Mehrzweck - Forschungsreaktor Karlsruhe (Deutschland)
ORGEL	ORGanique Eau Lourde (France)
R.W.E.	Rheinisch Westfalisches Elektrizitätswerke AG (Deutschland)
S.E.L.N.I.	Società Elettrica Nucleare Italiana (Italia)
S.E.N.A.	Société d'Energie Nucléaire Franco-belge des Ardennes
S.E.N.N.	Società Elettro Nucleare Nazionale (Italia)
S.I.M.E.A.	Società Italiana Meridionale dell'Energia Atomica (Italia)
S.E.P.	Samenwerkende Elektriciteits-Produktie bedrijven (Nederland)
T.N.O.	Nederlandse centrale organisatie van Toegepaste Natuurwetenschappelijk Onderzoek (Nederland)

ADDRESSES

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rue Ravenstein, Bruxelles - Tél. 13.40.20

Secrétariat du Parlement Européen
19 A, rue Beaumont, Luxembourg - Tél. 219.21 - 418.61

Cour de Justice
12, rue de la Côte d'Eich, Luxembourg - Tél. 215.21

Centre Commun de Recherche Ispra
191, Casella postale, Come - Tél. 781.31 à 781.35

Bureau Central des Mesures Nucléaires
200, Boeretang, Mol - Tél. 318.01

Kernreaktor Bau- und Betriebsgesellschaft mbH.
5, Weberstrasse, Karlsruhe - Tél. 26.825 à 26.827

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Commune St.-Martenburg, Petten - Tél. 441

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