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THE EUROPEAN ECONOMIC COMMUNITY AND THE ASSOCIATED
AFRICAN AND MALAGASY STATES

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Mr. President,

I thank you for giving me the opportunity of reporting here to the members of the Association Conference, in accordance with the wish expressed by the Conference, on the work performed by the European Atomic Energy Community in connection with the application of nuclear techniques in the Associated African and Malagasy States. Please allow me briefly to fill in the background details.

During a meeting held in Paris in December 1963, the Scientific Committee of the OAMCE (1) decided to set on foot investigations into the use of nuclear techniques in the Associated States. The Committee further expressed the view that the projects in question should be of the short-term type which could be completed within four to five years.

The Association Conference held at Dakar in December 1964 agreed that Euratom should be requested to undertake these studies and to do so from the triple standpoint of electrical energy production in nuclear power plants, biological research and prospecting for uranium deposits.

(1) The Union africaine et malgache, which originally had a membership of 13 African States and Madagascar, comprised a number of specialized organizations and in particular the OAMCE (Organisation africaine et malgache de Coopération économique). In July 1964, the UAM and the OAMCE were merged into the UAMCE (Union africaine et malgache de Coopération économique). At the meeting of African heads of State on 10-12 February 1965, this new organization was given the name of OCAM (Organisation commune africaine et malgache).

The Treaty establishing the European Atomic Energy Community does not contain any article upon which activities arising out of the aforesaid decisions could be based. On the other hand, Article 20 of Regulation 7 issued by the European Economic Community Commission, which lays down the procedure governing the operation of the European Development Fund, states :

"The financing in whole or in part of scientific or technical research concerning the populations of the countries and territories may be the subject of a project". In a publication by the EEC Commission entitled "The aims and operation of the European Development Fund", we find the following sentence: "As a general rule, priority shall be given to measures calculated to have a direct and rapid effect on the living conditions of the population".

In the meantime, the Euratom Commission had entered into a contract with Minister SAVARY ⁽¹⁾, under which the latter was assigned the task of studying the possibility of applying nuclear know-how in the Associated African States and Madagascar. In the spring of 1965, Mr. SAVARY submitted a report on the subject, which is at present being prepared for publication. I had the privilege of distributing preprints of this report to the members of the Joint Equal-Representation Committee in July 1965.

On the basis of the foregoing data, Euratom embarked on preliminary work in connection with a programme the salient features of which I outlined on behalf of the Commission to the Joint-Equal Representation Committee of the Association at its session in Berlin from 5-8 July 1965. On 29 September 1965, I submitted a report in Luxembourg to the Joint Equal-Representation Committee on the progress of the activities relating to this programme.

(1) Mr. Alain SAVARY, former Minister, has by virtue of his professional activity a very wide knowledge of the problems of development aid.

After Minister ROCHEREAU, on behalf of the EEC Commission, had undertaken at the Berlin meeting to study the financing of such projects by the European Development Fund, four preliminary conditions were established for a programme which for convenience I shall call the "Berlin Programme" and which consists of eight points. The prerequisites upon which agreement has been reached between Euratom and the EEC are as follows :

- 1) The work must have a direct bearing on the vital needs of the population of the Associated States of Africa and Madagascar;
- 2) The work must yield tangible results at an early date. Consequently, it cannot take the form of scientific research of indeterminate duration, but must consist in the application of already acquired scientific know-how which can be made to produce results within a period of about five years;
- 3) The work must have an infrastructure of plant and equipment already available in the areas concerned. Projects calling for the setting-up of new institutions would be incompatible with one of the foregoing conditions, namely that results must be achieved in about five years. Fortunately there are a number of suitable institutions already in existence to fill this need;
- 4) The projects must be assured of a favourable reception. Thus the activities in question must not be of the type that we in Euratom alone consider useful; we need the full backing of the governments of the Associated States and the local authorities. The governments' contribution will consist first and foremost in their submitting an application to the Development Fund. They must further be certain of having the cooperation of the local authorities, and in any event they must enact a number of additional measures designed to secure attainment of the objectives.

I should like to add some observations concerning these basic considerations :

- 1) The problems involved have been known for a long time and various methods have already been employed in attempts to solve them. Thus the aim of the Berlin Programme is to find a way out of long-standing problems by new techniques.
- 2) These new techniques are the fruits of years of scientific research. They are not entirely new, but may be deemed proven to the extent that they have already yielded satisfactory results in other countries. A case in point is the conservation of food by irradiation, which for some time has been applied on a broad scale in the US, the USSR and Canada. Combating a particular type of gnat by sterilization of the male has been tested out successfully in Curacao. The methods in question, therefore, have already proved their worth and have been established as being relatively harmless to man.
- 3) The work can only be undertaken in areas in which appropriate institutions already exist and the groundwork has already been done. The results, however, are of concern to all Associated States in Africa and Madagascar and once they have been tested under pilot projects they can be turned to account in all African states in which the same conditions obtain.
- 4) The projects are for the most part of a straightforward economic character, i.e. they produce in a foreseeable period results which can be assessed in economic terms. In this way, they open up the possibility of evolving similar projects for other African states, or other places in the same state, which can be financed either by the government of the country concerned or by means of a bank credit the interest on and redemption of which could be covered by the proceeds derived from operation in question.

- 5) During the implementation of the proposed project, the manpower required for other work could be trained locally.

To refer once again to Mr. SAVARY's report, which forms one of the cornerstones of the project, this contains conclusions on only three of the applications of nuclear technology. Uranium prospecting is left aside because :

- a) the Council of Ministers rejected a suggestion on the subject by the Euratom Commission;
- b) supplies of uranium ore are at the moment so abundant on so many markets that for the time being there is no economic advantage in searching for new deposits.

The three nuclear applications examined in the SAVARY Report are :

1. The generation of electricity by nuclear power plants;
2. The production of fresh water by desalination of sea-water with the aid of nuclear energy;
3. the application of radiobiology and isotope technology.

Having regard to the aforementioned conditions, the verdict must be that points 1 and 2 cannot be entertained until a later date.

The production of electrical energy by nuclear reactors is still in the experimental stage. Its competitive capacity vis-à-vis traditional methods is determined by local conditions and by a power-plant size which is not yet feasible in Africa and Madagascar.

It is, however, no part of Euratom's functions to construct or finance power plants. In the Community, power plants usually come within the orbit of the electricity sector, and are constructed

by the reactor industry and financed by the money market. In this field, therefore, Euratom is unable to cooperate.

Moreover, such units are initially prototypes and demonstration power plants the results of whose performances are not immediately available. It would be imperative to design smaller but at the same time competitive units for use in the Associated States of Africa and Madagascar.

As regards desalination installations, I have discovered to my surprise that these are by no means so few and far between. Plants producing more than 20 million litres of fresh water a day exist in Al Sheiba and Kuwait; others, in Italy, Malta and Israel, have a daily output of some 5 million litres of fresh water. There are at present 18 units, producing more than a million litres of fresh water a day. They operate mainly on mineral-oil derivatives. In the nature of things, they are located on the sea-coast and thus can be easily reached and cheaply fuelled by tanker. To run such installations on nuclear power would not be economic at the present stage.

The third point, the use of radiobiology and isotope technology, has given rise to the "Berlin Programme", which consists of the following eight points :

- a) improvement of millet;
- b) fighting the tse-tse fly;
- c) acclimatization of foreign breeding stock;
- d) conservation of fish;
- e) destruction of parasites in fresh meat;
- f) elimination of pellagra;
- g) combating the sand-fly or onchocerciasis;
- h) conservation of bananas for transportation.

Since July 1965, these projects have been thoroughly examined, and investigations have shown that before the end of the year, i.e. within a few days, four of them will have reached the stage at which a decision can be taken on them while the others will require further study.

It has also emerged that the Associated States can only submit their applications to the Development Fund when the necessary documents are available. This will be possible in a few days' time in the case of the following four projects :

1) Improvement of millet yield

In the arid zone of Africa, millet constitutes the staple diet of the population, accounting for 80% of the edible crops. In Senegal, Mali, the Ivory Coast, Upper Volta and Niger, there are altogether over 4 million hectares under millet. In 1963, the crop was estimated to have a value of 820 million French francs.

The yield, however, is unsatisfactory. In contrast with other cereals, millet is a plant which uses up its strength in producing leaves and stalks, yielding only 500 kg of seed per hectare. Added to this is the fact that, while the wild variety has a collar which acts as a sort of barrier to birds, the cultivated plant possesses no such protection, so that the seed is eaten by the birds. The "mange-mil" birds multiply very considerably and carry off up to 30% of the crop.

Research in this field to date has had two aims, namely :

- 1) to cultivate a protective-collar variety and
- 2) to increase the yield.

While the first of these operations has produced certain results, efforts to secure a higher yield by traditional methods, i.e. by the use of fertilizers and copious irrigation, have had

the opposite effect. The plant produces more green matter and less seed. The work is being carried out by the Agricultural Research Institute in Bambey (Senegal); the benefits of the new technique may be reaped in five years' time. The plan is first of all to complete the cultivation process, then carry out two successive seedings with satisfactory seed, and finally to undertake large-scale experimental cultivation. Later on, a "seeding institute" should be set up. The overall outlay amounts to 500,000 EMA u.a.

- 2) In vast areas of Africa, stock-breeding is hampered by the tse-tse fly and the diseases which it generates. This is one of the principal causes of the notorious lack of protein in the African population's diet. Much of Africa is overrun by the tse-tse fly. Action against this pest may succeed in certain regions, which are surrounded by mountains or sterile areas which constitute a natural barrier to the fly.

Theoretically, there are three possible remedial measures - curing the disease, breeding species with strong powers of resistance and extermination of the tse-tse fly. The only practical method is that of extermination; here too it is a matter of underpinning the work now in progress by the use of new techniques. In the early stages, chemicals will be employed, but this will have to be followed by actual biological extinction as other wise it will not be long before new strains of tse-tse fly develop which may prove able to resist the chemicals used.

The project will thus consist in breeding tse-tse flies and sterilizing the males by irradiation. It will also be necessary to ensure that the tse-tse fly preserves its biological integrity, as it is to be released in breeding grounds, where it will mate with female without fertilizing it. In this way, the number of descendants will automatically be diminished, and the method will be all the more effective as the male will seek out the very last

female fly and thus initiate the process of the extermination of the species. This task is to be assigned to the Institute for Livestock Breeding and Tropical Veterinary Medicine at Bouar (Central African Republic), which is already engaged in similar activity on behalf of Cameroun, Chad and Central Africa. The experience thus acquired will accordingly be able to be used immediately in the other Associated States. The work is expected to take six years and the cost will be 650,000 EMA u.a.

- 3) The lack of protein in the African population's diet throws into relief the importance of developing fisheries. This deficiency can be remedied fairly rapidly by large-scale fish consumption. In tropical climates, however, fish are too perishable to be able to be transported into the interior, and cold-storage would call for a vast amount of plant and equipment, which in turn would raise prices appreciably.

By means of very low-level irradiation, however, the fish could be kept fresh for a few days (provided there is an appropriate reduction of the temperature) without any adverse effect on the taste or consistency.

A factor propitious to the setting-up of a fish-conservation unit is the fishing port built on the Ivory Coast with aid from the European Development Fund. Here some 15,000 - 20,000 tons of herring were landed in 1964; part of it was consumed in Abidjan and part in the interior as far as Bouaké. Irradiation storage would make for still wider distribution.

This part of the programme is to be carried out in three stages, i.e. :

- a) Determination by the Agricultural Institute at Wageningen (Netherlands) of the radiation dose required for conservation purposes.

- b) Checking of the results in local conditions by means of a provisional irradiation plant.
- c) Construction of an irradiation unit in the fishing port near Abidjan.

The time required for these operations is three to four years, and the costs are set at approximately 700,000 EMA u.a.

- 4) A similar problem arises in connection with the preservation of fresh meat. The flesh of cattle and zebus frequently contains tapeworm larvae. Where such meat is eaten, the larvae pass into the human system, where they continue to grow. Thus the policy at the present time is to destroy the affected part of the meat. By very low-level irradiation, however, the larvae can be rendered harmless, thus making it possible to prevent a loss which at the moment amounts to 30% of the total number of animals slaughtered. Excellent conditions for a pilot plant are at present to be found in Fort Lamy (Chad). The slaughterhouse has an annual capacity of 6000 tons and is in the immediate vicinity of the Farcha laboratory, which is already dealing with this problem as experienced in Chad, Cameroun and the Central African Republic. The setting-up of an irradiation unit, in the same three stages as for item 3, would enable the larvae to be completely exterminated, in all the animals slaughtered, within about three years at a cost of 600,000 EMA u.a.

I should emphasize that the radiation dose employed is far below the danger-point and also that the technique is already in use in various parts of the globe. The personnel required for the work, who would have to be familiarized with the new techniques, are already present in the institutes.

These, then, are the four "Berlin Programme" projects upon which it will be possible to take a decision before the end of the year. The other projects are being studied further, and I hope in the very near future to be able to report to you on them. For the rest - even though we have concentrated initially on the most favourable projects - the research is being continued and the quest pursued for further applications of radiobiology and isotope technology in the Associated States of Africa and Madagascar. The four projects which I have outlined will be able to be launched immediately after the relevant decisions have been taken. I hope, Mr. President, to have a suitable opportunity of informing you of the status of this work in due course.