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SCIENTIFIC AND TECHNICAL RESEARCH AND THE EUROPEAN COMMUNITY

PROPOSALS FOR THE 1980s

Communication from the Commission to the Council

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The challenge

1. The Commission, as it has already emphasized in its response to the 30 May mandate,¹ has shown its willingness to confront the challenges of the 1980s.

It is clear that due recognition must be given to the part which scientific research and technological development can play in any strategy for regeneration, arising from its capacity to anticipate the long term and because of the inescapable links between growth, technological innovation and social change.

Towards a common R&D strategy

Community activity up to now

2. The Member States of the Community have long recognized the importance and value of joint action in science and technology. The Council therefore approved Community involvement in the whole field on 14 January 1974,² and the Commission was given the task not only of progressively coordinating national policies but also of undertaking R&D programmes itself where there was a Community interest.

On the basis of this, after the phase of developing various specialized research activities under the auspices of Euratom and the ECSC, the Commission has progressively defined and carried out a series of research programmes. In adopting this pragmatic approach to what it has devised, put forward and carried out, the Commission has treated each proposal on its merits. The overriding consideration was that each should contribute to the establishment of the various appropriate Community sectoral policies (particularly energy, raw materials and the environment).

It is in this way that, since 1974, the Commission has been able to create a sophisticated mechanism for evolving R&D activities, and for carrying out, evaluating and exploiting them. Its use of this mechanism has given rise to an extra dimension of European scientific and technical cooperation in many sectors. Community R&D is clearly here to stay: several

thousand researchers from all the countries in the Community are working together now and for the foreseeable future in pursuance of Community objectives in the major sectoral programmes.

The budget devoted to these R&D activities has grown steadily from 70 million ECU in 1974 to more than 300 million ECU in 1980. The finances are distributed as follows:

Priority areas	% of the total R&D budget
1. Energy	72.0
2. Raw materials	2.3
3. Environment	8.4
4. Agriculture	1.1
5. Industrial sectors	9.7
Total 1+2+3+4+5	93.5
6. Other	6.5
Total (R&D budget 1979)	100.0

Although it might appear that Community R&D spending has built up rapidly, it should be said that it is still relatively feeble compared to what Member States spend on their own programmes (about 1.5%), to what Member States devote to international cooperation (about 16%) and to the general budget of the Community (about 1.8%).

The value of the Community's experience

3. Given that both the available resources and the areas covered have been limited, it is remarkable that most of the work undertaken has led to significant results. In some cases Community work has had a worldwide impact.

Taking energy as an example, the work done in the field of new and renewable sources served as a stimulus and catalyst for national efforts. This was especially true of solar energy, where the work laid the foundation for cooperation between industrial companies and for fruitful collaboration between European laboratories. This provided Member States with the chance to acquire a scientific and technical capability in the field more quickly than if they had been limited to isolated or dispersed initiatives.

¹ Supplement 1/81 — Bull. EC.

² Except for areas covered by military or industrial secrecy.

The same combination of catalysis and promotion can be seen at work in the environment sector, where Community R&D activities in support of selected priorities, such as the examination of the effects of pollutants like lead in petrol, have been a direct stimulus to national efforts in the field. They have also led to coordination which now applies, directly or indirectly, to 20% of the research undertaken in Member States.

In the case of raw materials it was the national experts themselves who proposed a major extension of Community involvement, ranging from metals and minerals (locating seams, methods of extraction and treatment) to recycled materials such as paper and board.

Again, with steel, the Community can take the credit for many measures which have reduced production costs and improved product quality.

Fusion is another case in point. It is a fine example of the benefits of joint working for long-term benefits; in JET the Community will have a facility which will keep it on a par with the United States, the Soviet Union or Japan.

Programmes dealing with nuclear fission, such as reactor safety, the management and storage of radioactive waste products, control of fissile materials and radioprotection, make up a joint response to problems which Member States have in common. The quality and scope of the programmes together with the availability of major experimental installations means the Community is well placed for international cooperation. This has been underlined by treaties signed with the IAEA, the United States and Canada.

Other programmes have proved their worth in spite of their restricted scope. The first medical research programme demonstrated the effectiveness of joint action focused on subjects such as the extracorporeal oxygenation of blood, and cellular ageing. The agricultural research programme, in its turn, has had considerable success in the field of animal health and soil fertility.

The recognition earned by the Central Bureau for Nuclear Measurements and the Community Reference Bureau (BCR) emphasizes the need to undertake specific actions (such as on reference materials and techniques) and to provide a public service for laboratories and European

industry so far as norms and standards are concerned.

Community activities of a more general character which should be mentioned include:

- actions to do with information and with scientific and technical documentation, particularly in the context of the Euronet/Diane network;¹
- the training of researchers and measures to promote their job mobility (which applies particularly in the context of the fusion programme).

As a final point one should note:

- cooperation with European non-member States in the framework of COST.

Although the levels of quality and effectiveness which Community research has attained up to the present are widely recognized, factors such as Europe's falling behind its main competitors, the scale of the problems to be faced and the urgent need to make the best use of its financial resources compel the Community to set its sights considerably higher.

The need for an overall approach

4. It is the experience which past achievements have brought to the Commission which gives it both the right and the justification to suggest a new stage in the progress of European R&D. It must be said that the pragmatic approach, which has, up to now, been a matter of undertaking successive research programmes in separate sectors, has not been particularly helpful in enabling the Community to make the best use of the whole range of its resources (financial, fiscal, regulatory, support for innovation) with a view to achieving specific socio-economic objectives. In particular the approach has made it difficult to articulate certain actions and integrate them into an overall strategy. Whatever the value and effectiveness of the programmes and the coordination which the Community has carried out to date in the field of science and technology, it would seem that they are no longer adequate to make a sufficient response to the challenges which confront

¹ Community telecommunications network specially designed for the diffusion of scientific and technical information (it gives more than 2 000 users direct access to 120 data bases and data banks).

the Community or to rally national efforts in the light of that response. Better than any amount of theorizing, a table

brings out the fact that Europe's deficiencies in this field are not due to any lack of manpower or resources.

1980¹

	Total gross spending on R&D (million ECU)	Public spending on R&D (million ECU)	Total R&D spending as % of GNP	Total R&D staff	Scientists and engineers	Population (millions)
EUR 9	39 500	19 405	2.0	1 100 000	370 000	260
Japan	15 160	6 560	2.0	619 000	363 000	113
USA	43 370	22 030	2.3	1 520 000	659 000	230

¹ Comparison based on data collected by the statistical working group of CREST and the scientific services of OECD and UNESCO.

If Member States, despite the importance and worth of the scientific effort they can muster, seem frequently poorly prepared to respond in isolation to the scientific needs which have arisen or are about to surface through the changes in European society, this is mainly due to the fact that their potential for R&D and for technological innovation is weakened by the following factors:

- the slowness of public research — particularly in the universities — to adapt its structures to changing circumstances;
- Member States are each trying to tackle too many of the same topics — this leads to dissipation of effort;
- there isn't a favourable climate for pursuing research bearing simultaneously on several sectors of activity or for the exploitation of the results of both fundamental and applied research;
- lack of sufficiently close relations between public research and industry.

These factors reduce the effectiveness of the European research system and mean that, often, the response offered by science to the demand (whether from industry, government or society at large) is inadequate. At the same time there are clear gaps in the research continuum, where some activities are considered to be too much like applied research by the universities and too much like fundamental research by industry. The validity of this diagnosis is confirmed by the need felt by some large industrial companies to get their basic research carried out in institutions outside Europe.

These circumstances call for the setting out of an overall strategy, the general conception and guidelines to be agreed between all parties, which would constitute the framework in which the objectives and priorities for Community research and development activity could be established in clear continuity with actions already undertaken.

Guiding principles and the objectives of a common strategy

5. Working closely with Member States the Commission intends to set out the identifying features of this next stage in the light of two guiding principles:

- getting the best out of Community activities while ensuring that they are integrated into an overall strategy,
- exploiting to the full the benefits conferred by the European dimension.

Getting the best out of the Community's experience

6. The Commission expects to be able to develop its action along the lines laid out in its report on the 30 May mandate, aiming particularly at new possibilities of growth and an improvement in the employment situation. This will mean building on the evaluation work which has already been done in connection

with common R&D activities and upon the results of the FAST¹ programme in order to:

- consolidate and strengthen some of the existing programmes,
- select guiding themes for choosing R&D actions to pursue in the longer term.

Adapting ongoing or forthcoming activities

7. Over and above its scientific value, joint R&D activity must be seen in terms of what it can contribute to the Community's overall strategy, and the way it can underwrite various Community activities.

Seen in this light a number of new priorities and orientations could be applied at once to ongoing or forthcoming programmes.

- In the energy sector it would be possible to strengthen the research connected with economizing on energy or to do with alternative fuels. This could be achieved in such a way as to ensure more coherence between Community scientific activity in this field and the Community's policy objectives (management of resources, energy, employment).
- At the same time the links between environmental research, energy research (e.g. coal) and agricultural research (e.g. agricultural waste) would be reinforced.
- Activities aimed at supporting certain traditional industries which are now in difficulties would be extended so as to be of real help in making the changes which are necessary and to give a fillip to their competitiveness (e.g. steel, textiles and clothing).
- Steps would be taken to encourage the greatest practicable exploitation of the bases of modern biology and the development within Europe of applications where the US and Japan have gained a lead (taming genes and what they can produce).
- In an attempt to improve Europe's competitiveness in the medium and long term more will have to be done in the realm of new technologies for information handling, communications and automation. To this end the Commission will suggest the rapid implementation of an

¹ Forecasting and assessment in the field of science and technology.

R&D programme firmly aimed at the long term, with the object of increasing Europe's capacity to produce microprocessors and optoelectronic equipment designed to transmit, handle and process information.

- An improvement in the Commission's capacity to analyse and evaluate likely developments in the future would be made so that priorities for the Community can be assessed in a consistent way. For this reason it is suggested that a regular and systematic review of the strengths and weaknesses of the Community's scientific and technical potential be undertaken by a structure for 'perception and evaluation'.

Priority themes for an even more significant R&D action

8. The effectiveness of Community action is bound up with the extent to which it is formulated in terms of jointly agreed general objectives.

Agricultural research should, as a matter of priority, be encouraged to make a contribution to alleviating the problems experienced by the common agricultural policy. On the one hand it should help to relieve some of the shortages which Europe suffers (oil, proteins, wood, tobacco) and at the same time contribute to reducing the surpluses. On the other hand it ought to open up new markets for certain food products or even energy sources. Lastly, it should lead to the identification of new production techniques which are less costly in terms of input and less damaging to the environment.

This renewed research effort in agricultural research should preferably be directed towards those areas which have benefited the least to date from technological innovation. Top of the list of these is the Mediterranean region, which needs a real technological renaissance. The development of agricultural research is also consistent with the desire of the Commission to make the best possible use of the resources already available to it before seeking any more.

It is most important that industries of strategic importance which are undergoing drastic changes, such as the chemical and motor vehicle industries, continue to be generators of wealth, foreign currency and employment for Europe. To this end it is important that Com-

