COMMISSION OF THE EUROPEAN COMMUNITIES

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STIMULATING THE COMMUNITY'S SCIENTIFIC AND TECHNICAL POTENTIAL

(Communication from the Commission to the Council)

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Introduction.

In its communication of 12 October 1981, put before the Council of Ministers on 9 November 1981, the Commission proposed that a Community Research and Development strategy be developed, involving the establishment of a general framework programme which will be a means of strengthening and broadening the activities carried out up to now.

Among the seven basic policy options which the Council of Ministers chose for the framework programme on 8 March the Commission feels that the one providing for the "improvement of the scientific and technical efficacy of the Community" ought to be given particular attention.

This stimulation of the scientific and technical potential of the Community is an essential feature of the Community strategy which is envisaged with the aim of contributing towards the solution of the socio-economic difficulties which confront all our countries.

I. Basic principles.

In the wake of numerous studies (see Annexe I) the Commission outlined (1) (2) those negative characteristics which limit the creativity and the efficacy of the Community's scientific and technical potential, a potential whose scale and quality is, in fact, considerable.

The Community's science and technology cannot enjoy the most favorable conditions for progress unless the efforts already undertaken to stimulate RD are mobilised in a co-ordinated way and strengthened, unless there is consensus between public authorities, the scientific and technical community and industry and unless full advantage is taken of the benefits offered by the European dimension. Otherwise the impact of European Research and Development on socio-economic development will, in certain fundamental fields remain minor, and it will only rarely bear any relationship to the resources devoted to R and D. Faced with the need for new impetus to be given to the efficacy of their research and invention capacity the Member States have undertaken a certain number of measures both at national and international level (3); the Commission is already undertaking certain specific action in the context of Community RD programmes or complementary to them (4)

(1) Scientific and technical research in the European Community : Proposals for the 1980's (COM/81/574 final).

(2) Stimulating the scientific and technical potential of the EEC : perceiving the needs and actions to be undertaken (preparatory note for the 8 March 1982 Council - SEC/309/82.

(3) Take for example the activities of NATO's Scientific Affairs Division, the European Science Foundation (ESF)'s training programme for brain research, or the European Molecular Biology Conference (EMBC)'s programme of grants.

(4) We might cite as an example the Community programme in the realm of education and scientific and technical training or grants towards the development of joint study programmes.

However, since they are often too specialised, being focussed on particular areas of activity (as are those of the ESF or EMBC), or too closely linked to specific research themes to the exclusion of all else, these activities represent only a partial response to the changing needs of the Community and its Member States in spite of their undeniable interest and effectiveness in themselves.

A different kind of Community activity is required to develop and reinforce the measures already undertaken at the national, international and Community level, with a view to developing European science and technology in a more satisfactory way. In any case the preparation of the general framework programme for Community scientific and technical activity calls for the implementation of Community action of a complementary nature.

Indeed the use of any overall medium and long term planning tool such as the framework programme means that the capacity to undertake "non-constrained"[1] operations must exist in addition to those which are planned and programmed, so that the element of flexibility speed and "edge" so important to all RD strategies can be retained. The main objectives of these special operations, intended to be a direct complement to the basic idea of the framework programme itself, ought to be the rapid identification of opportunities, speed of reaction and the testing and verification of hypotheses prior to the preparation of major programmes projects or activities over the medium term. They should also involve the improvement of scientific communication and training through staff mobility and the exchange of ideas.

The foregoing sets out the basic principles of the plan which is envisaged to correspond to the "stimulation" policy option within the framework programme.

II. Community initiatives to be considered.

II. 1. Field of activity.

The Commission feels that the stimulation measures which ought to be undertaken should be able to cover the whole field of science and technology. They should in particular make possible the direct stimulation of work which might have a beneficial influence on the industrial competitiveness of the Community, on the basis of an appreciation of the potential applicability of basic research results. At the other extreme they should make it possible to support pure research.

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(1) "non-constrained" operations are those which follow up an unexpected discovery or technique or respond to an unforeseen need and which cannot therefore be programmed in advance.

II. 2. Principles and decision criteria.

Community intervention must be able to be made in response to three basic imperatives

- the conception and development of these activities must be undertaken in close collaboration with the people concerned and who have an interest (researchers, engineers, industrialists, those responsible for RD at the national level) and must be coherent with national or Community RD activities.
- it must be possible to move quickly from the preparation of a Community activity or project to its implementation by using teams of recognised quality
- there must be a desire not to build up new national or Community structures or infrastructures : thus the development of new research centres or of a body of research workers is not envisaged; nor is it intended to give financial support to teams which could lead to a permanent commitment.
  Therefore there will be a systematic use of existing national centres, to include the day to day management of projects. Community administrative support must remain light weight.

Bearing in mind the basic aim of the stimulation activity the essential criterion which must determine the sort of projects to be undertaken and the choice of intervention methods and men to carry them out should be quality, that is

- the quality of the analyses and evaluation required to define the activities
- the intrinsic scientific quality of the action or the men to be supported
- quality as expressed in the precise extent to which the potential results are appropriate to the needs of the Community
- the quality endowed, or value added by the Community dimension.

I. 3. Objectives.

To achieve the overall objective of the Community stimulation activity (ie. strengthening and improving the creativity and efficacy of the European Scientific and technical system) the Commission must :

A. improve the extent to which the response of science and technology is appropriate to the Community's requirements by building up its capacity to react to unforeseen problems, adapt to changing circumstances and take advantage of promising scientific and technical discoveries. It must also undertake scientific and technical operations with a view to facilitating cross fertilisation between different scientific and technical disciplines where a predetermined application needs to be achieved, or where it is necessary to evaluate the potential of some avenue of research in respect of a specific problem. The devising and selection of such operations will have to be based upon a thorough knowledge of promising discoveries and upon their evaluation.

B. promote and develop the quality of RD in itself, without insisting upon too strict a relationship to short term scientific objectives. This would be done by supporting particularly talented research teams; assisting combined RD activities involving teams from various Member States; encouraging exchanges of research workers between European laboratories (both university and industrial, and ranging from basic to applied research); and by supporting activities oriented towards solving specific problems rather than towards any one scientific discipline (ecological projects are an example).

C. make the best use of young talent and build up the scientific and technical strength of the Community for the future; mitigate the imbalance in the age structure of the research work force by making new research opportunities available to young scientists (grants, research allocations); make a contribution to regional scientific and technical development through the training of specialists.

II. 4. Community activities to be developed.

II. 4. A. Analysis and conception.

So that it may define and select the stimulation activities, as well as establish a Community RD strategy the Commission must :

- be aware of the strengths and weaknesses of the Community's scientific and technical potential, the circumstances and structural constraints that might restrict creativity, competitiveness and the exploitation of results. Such an analysis of overall scientific

and technical Community itself, in the framework of a dialogue held with active specialists. These indeed are the first and often the only people to possess the necessary information while it still has innovating potential.
This dialogue already takes place, to a certain extent at least in every RD field, or group of fields in which Community programmes are under way, thanks to the existing consultative system (1). To gain the necessary awareness, both for the establishment of the general framework programme and for the stimulation activities the Commission must be able to have the benefit of a body which would act as an interface, extending over the whole area of scientific and technical activity, between Community decision-makers on the one hand and national scientific and technical circles on the other.

- be able at all times to gain an appreciation of known or foreseeable socio-economic requirements. For this purpose the Commission has, notably, the FAST research team. This programme is coming to its conclusion. The function it performs will need to be carried out within the Commission so that there is continuity in the supply of forward analyses and assessment which the Community needs on the interrelations between science/technology and society.

II. 4. B. Interventions.

To achieve the objectives set out in II.3 two methods of intervention have been selected.

- the implementation of specific scientific and/or technical operations : ie. projects. They might perhaps represent a direct socio-economic interest (2), they might relect a promising new scientific and/or technical prospect (3), or they might make possible a conclusive test on an interesting avenue of research and/or development (4)

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(1) see document EUR-6745 : Committees working with Community institutions and active in the field of science and technology.
(2) By way of illustration one might cite a project addressing the problem of assembly with adhesives; which involves physics, chemistry, engineering and computer science in equal measure. It also calls for as much in the way of basic research as applied. It is of great interest to the aeronautics industry but equally so to the furnityre, packaging, motot vehicle, trans--- port and pharmaceutical industries.
(3) As an example one could quote the development of organic supra-conductors by synthetic means. Their availability on an industrial scale would be of great interest in any number of sectors, viz the miniaturisation of electric motors, magnetic levitation transport systems, storing electricity, water purification by magnetism.
(4) For example the study of various phenomena concerning the space, time or or space/time structure of solids.

(in terms of the spin offs for economic development) (5).

- provision of help for talented research workers or teams, supporting worthwhile activities by assisting the mobility of high quality researchers, offering them new research opportunities or supporting multidisciplinary work. In the latter case it is a question of facilitating osmosis between scientific work carried out in different disciplines and different countries relating to research of common interest.

II. 5. Operational arrangements.

The analysis and assessment activity required for devising stimulation activities, as well as for preparing the overall RD strategy will be carried out with the help of studies, evaluation and consultations performed in close collaboration with the scientific and technical community and by calling on the advice and expertise of personalities of high standing and recognised authority who will make up the active nucleus of a referee system.

To carry out its interventions (projects and assistance) the Commission will make use of a whole range of financial support measures, of limited duration which will be made available to research workers or existing national or multinational teams on the basis of authorised and independent recommendations (they will take the form of grants, research allocations, subsidies, development contracts, conferences, summer schools and so on).

III. Carrying out the Community stimulation activity.

III. 1. Conception.

The Commission would think out the "stimulation plan" (a policy option in the framework programme) which would be needed to reflect the orientations decided upon by the Council. This would be done on the basis of an analysis of scientific and technical needs, an appreciation of the strengths and weaknesses of RD systems and an evaluation of promising avenues of research. It would equally be based upon analytical work carried out by the Commission and on the results of evaluation of tis RD programmes. The Commission would be helped in this task by the Committee for the European Development of Science and Technology which it intends to set up (2). It would proceed with the necessary consultations, particularly by means of calling on the services of referees (this

(1) As is the case for example in respect of certain activities in the realm of cellular biology which has great potential interest for the pharmaceutical industry.

(2) See also Annexe 2

would be the way that the perception and estimation function would be fulfilled, the importance of which was emphasised by the Commission in its communication to the Council of 12 October 1981, doc. COM(81)574.

III. 2. Adoption.

The proposed plan (including the areas of intervention and the necessary resources, the relative proportion of projects and assistance, the sort of projects envisaged) would be submitted to the Council in the course of the examination procedure for the framework programme (1). The Council would then adopt the stimulation plan to be carried out and decide the resources correspondingly.

III. 3. Implementation.

Assisted by CODEST and the scientific referees the Commission would implement the adopted plan. On the basis of the Committees scientific and technical opinions it would choose from among the requests for intervention (assistance) and would select the teams capable of bring the projects to be undertaken to a successful conclusion. The Commission would make sure that the selcted activities were coherent with national activities.

III. 4. Control.

- of each operation :
  On the scientific level this control would be according to the evaluation procedures under way or expected in respect of Community RD activities (ie. making use of independent outside experts.) On the financial level it would be undertaken by the competent Community authorities.
- of the plan overall :
  This would be by means of an objective and independent study, after some years, which would be carried out in accordance with the procedures used by the Commission for its Community RD activities, and, more specifically by making use of a group of independent experts.

IV. Resources needed.

The Commission sees the implementation of these new activities taking place in two phases :

(1) see Annexe 2.

A. In the first phase, lasting one year, the appropriate procedures having been set up at the end of 1982, relatively modest financial and personnel resources (of the order of 5 Mioecu) would be allocated to several pilot experiments in the field of stimulation.
This first stage would, in particular, make it possible to test the selected avenues and procedures for intervention, to draw up a preliminary outline plan for stimulation and to establish how much in the way of resources would be necessary in the medium term to achieve it.

B. At the end of that year, during which the operational instruments would be set up and tests of the intervention procedures carried out, the first outline plan for stimulation 1984-1987 would be submitted to the Council. This outline would then be the model for the preparation each year of a detailed stimulation plan (as a policy option within the framework programme) which would be put before the Council according to the procedure for examining the framework programme (see section III above).

V. Conclusion.

The Commission whishes to gather the Council's observations on the orientations which have been chosen in the present communication.

ANNEXE 1

1978 : "The awareness of social needs on the part of the public and the public authorities" - G. Denielou
"How is science related to Society" - H. Brooks
Science adapted to the needs of Society :
- "The viewpoint of basic research" - L. Van Hove
- "The viewpoint of applied research" - U. Colombo
- "The viewpoint of industry" - Ch. Kramers

(Seminar on "European Science and Technology faced with the challenges of the present society" (Compiègne October 78)

1979 : "Science and the Second Renaissance of Europe" - A. Danzin
(report by the chairman of CERD, based on a number of studies by CERD)
viz - "Orientations à donner à la RD européenne en fonction des besoins à moyen et à long terme en matière de RD" (1977)
- "Un plan scientifique et technologique à long terme pour l'Europe" (1978)
- "Une science pour une nouvelle croissance en Europe" (1979).

1980 : "Employment prospects and mobility of scientists in Europe" - ESF
"Science and Society in a changing Europe" - I. Prigogine
"The case for a new European research enterprise" - G. Denielou
"Method and mechanism for the identification of the scientific needs of society" - A. Phillipart.
"The European Community and Innovation" - U. Colombo and W. Zegfeld

(Conference "Research and Development in the European Community - towards a new phase in the common policy" - Strasbourg October 1980.

1981 : "Stimulation of the European Research effort" - I. Prigogine
"The Scientific Community and Research in Europe" - I.F.O and Institüt für Demoskopie.
"Evaluation de la recherche dans le domaine des sciences physiques et biologiques" - E. Mees, G. Gerard, October 1981.
"Scientific research in the European Community; Perspectives and Prospects" - Solvay Conference, Brussels, November 1981.

ANNEXE 2

1. Committee for the European Development of Science and Technology (CODEST).

The Commission believes that none of the existing Committees can form the consultative body which is required (see section III.1) but that insteda it could take on the current functions of the Committee known as CERD, and its sub committees (1).

The Commission therefore proposes that CERD and its sub committees be replaced by a Committee for the European Development of Science and Technology (CODEST). Set up under the auspices of the Commission, CODEST would bring together some 20 personalities of the highest standing and recognised authority from the worlds of science, technology and industry. They would be appointed by the Commission, and Members of the Committee would serve in their capacity as individuals. No EEC country would be represented by less than one Member nor by more than four.

Members of CODEST would be appointed for four years and would only be able to serve one term.

The cycle of renewal would be one quarter every 12 months so as to ensure continuity in the work.

The Committee would meet regularly and, between meetings, could be permanently represented by its chairman (appointed by the Commission after consulting the Members) and by certain Members, selected by the Committee, who would make up the "bureau". Preparation and follow up of the Committee's work would be undertaken by the Commission.

2. Outline of operating arrangements.

Once CODEST hastaken over the functions of CERD, the responsibilities for implementing stimulation activities and projects would lie as follows :

- devising the annual stimulation plan :
  The Commission on the basis of the analyses and assessments provided by CODEST.
- adopting the annual stimulation plan and establishing the corresponding level of resources
  The Council and the European Parliament on the basis of the Commission's proposal, prepared in the light of CREST's opinion (framework programme)
- initiating activities
  The Commission, in consultation with CODEST , who would call upon referees.

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(1) CERD : energy
CERD-ESIST (European Scoiety and its interactions with Science and Technology)

- control

  The responsible Community institutions, plus the use of independent experts.