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COMMUNICATION FROM THE COMMISSION

Researcher's Europe

Stimulation of the International Cooperation and Interchange
Needed by European Research Scientists

(SCIENCE)

Plan 1988-1992

I Introduction

There has been for years a broad consensus amongst Community and national political authorities and amongst the socio-professional circles concerned on the need to construct a Researchers' Europe as an essential condition for the improvement of the Community's scientific and technical competitiveness. This effort will have to be based on people, the research and development teams, the aim being to establish multidisciplinary networks of various types of institutions within which the mobility and complementarity of scientists, methods and results can be guaranteed.

It is therefore generally recognized that to increase the Community's scientific and technical competitiveness and to promote the harmonious development of the whole Community it is essential significantly to step up the current intensity of cooperation and exchanges between research scientists in Europe. In this way the creation of a scientific space worthy of the Community's large internal market could be achieved. For many years numerous national and international bodies in the public and private sectors have been working efficiently in Europe to develop the mobility of research scientists and encourage scientific and technical cooperation. It is nevertheless essential to follow up, to strengthen and to supplement these activities so as to achieve more significant level both in terms of the number and duration of the exchanges and cooperation arrangements and in terms of their diversity and quality, while at the same time ensuring the continuity required by the initiatives which have been launched up to now.

The increase in mobility of researchers and in scientific and technical cooperation in Europe which is now being sought is by no means an end in itself. It should be seen as a way of improving the cohesiveness of European science and technology, increasing its creativity and effectiveness with a view to ensuring greater economic competitiveness while reinforcing Europe's cultural identity. In fact, it makes possible not only a better dissemination of ideas, methods and results, and a strengthening of links between researchers possessing different outlooks and cultures, but it also makes it possible to undertake work which it would otherwise be difficult to attempt.

The plan to stimulate European scientific and technical cooperation and interchange adopted in 1985 offers an excellent way of boosting the mobility of scientists and scientific and technical cooperation within the Community. Being as it is an original initiative having no equivalent in Europe, the United States or Japan, it is also a useful basis to encourage wider exchanges between the Community and other non-Community countries in Europe.

In the light of the experience gained since 1983 when the experimental stimulation action was started, and bearing in mind the requirements resulting from the extension of the Community in 1986, the Commission proposes the launching of a new plan 1988-1992 of a critical size sufficient to have a significant effect in establishing a genuine Researchers' Europe and to maintain the level of credibility necessary to keep up the interest of the best R&D teams to this end by guaranteeing a reasonable level of acceptance for the "high quality" proposals. As envisaged in the Framework programme 1987-1991, this plan forms the basic nucleus of a wide ranging activity which will also include contextual measures to benefit the mobility of researchers as well as a system of "career awards" for eminent scientists. At the same time, this plan supplements the activity which is due to take place to help European researchers in the framework of the "Community plan to facilitate the use of large-scale scientific facilities of interest to Europe"

II The "SCIENCE" plan

An initial plan to stimulate European scientific and technical cooperation and interchange was adopted and launched in March 1985. In addition to the assistance (bursaries and research grants) it offered for the training and employment of young scientists in a Community country other than their own, this plan was designed to set up cooperation and interchange networks, in which it was successful. This means that several laboratories or R&D teams in different Community countries and of various types (university or other), or even in some cases only two partners, get together on one or more R&D topics so as to pool and exchange various resources (human or technical) and their research results.

By May 1987, 346 joint projects had brought together 2,550 research scientists (full-time equivalent) belonging to 950 different teams. Of these, 32 have led to the setting-up of networks as defined by the Committee of Research Ministers of the Council of Europe in their statement of September 1984.

If at the same time one bears in mind that by the same date the Commission had received 575 requests classified as high quality, involving some 7,000 researchers, one may justifiably consider these figures to be a significant indication of the cooperation needs of Community researchers, their wish to develop intra-European associations and of the effective contribution the Stimulation Action is making towards the creation of a European scientific and technical space

These activities, which make it possible to bring together scattered expertise on advanced problems while establishing significant exchanges of research scientists, have demonstrated their efficiency (see "Evaluation report" of 1986) both in terms of cooperation intensity and in terms of the quality of the scientific results obtained

Here are some significant examples of the scientific results obtained. Researchers from 16 teams in 6 Member States participating in the European Joint Optical Bistability Project have succeeded in developing optical logical circuit elements using the property of optical bistability peculiar to certain materials. This achievement is an important step towards the development of an entirely optical computer, and according to the eminent expert who evaluated the project, is a major scientific success.

It is now possible to design entirely optical relays for optical fibre networks and spatial light modulators for a radically different technology for screen displays and projection, as well as optical systems for broadband switching

Equally useful results have been obtained, for example, in the field of molecular materials (polymers for electronics and opto-electronics) where the research has already led to the filing of major patent applications

In addition a whole series of research projects on interface phenomena and on the catalytic properties of certain materials have yielded know-how that may make it possible to develop more efficient catalysts for several industrial processes (for example, removal of nitrogenous and sulphurous compounds from oil during refining, photochemical bleaching or the production of sulphuric acid)

Another project bringing together teams from three countries has succeeded in developing systems to test the toxicity of medicinal products that can usefully replace animal experiments. In solid state physics, laboratories at Louvain, Roskilde, Koln, Compiègne and Surrey are working together to study the effects of flaws in composite materials, a new category of materials whose resistance to service stresses and environmental conditions is very different from that of traditional materials. The results already obtained have aroused keen interest in industry

Thus, to date, a "Stimulation Plan" has been implemented mainly by putting the emphasis on the development of intra-

European scientific cooperation For the future the plan aims to widen and to supplement this approach by taking account of three major concerns .

- to understand better and to analyse the needs of European science and technology
- to form a homogeneous range of aids for the training, specialisation and employment of European scientists
- to increase the intensity of cooperation and mobility of researchers within the Community

1 Objectives - Lines of action

a) Perception of requirements.

The first objective should be to match as closely as possible the strengthening of scientific progress and creative capacity obtained by the stimulation measures to the economic and scientific requirements of the Community.

The Committee for the European Development of Science and Technology (CODEST) is responsible for analysing scientific and technical requirements and opportunities in Europe. Its activities should be developed and strengthened so that, together with the relevant national or international bodies (European Science Foundation, for example), it can help to define the research and technology requirements (whether scientific, economic or social) perceived by European society and examine the value of new scientific and technical breakthroughs. In this way the Community, which also has available to it analyses of medium and long term S/T perspectives through the FAST programme, will be better able to identify R&D requirements and then to grasp and encourage the new scientific and technical ideas and possibilities that can lead to economic progress.

Studies, surveys and meetings bringing together representatives of all the circles concerned will help to define and evaluate requirements and thus guide the decisions for stimulation activities and also, where appropriate, other Community R&D activities.

b) Promotion of training through research and the employment of scientists in Europe :

At a time when the average age of European research scientists is increasing (it is now about 45) and prospects for young scientists are dwindling (1), the training of highly qualified specialists and the encouragement of the young generation of scientists must remain one of the main subjects of concern in the construction of a Researchers' Europe

Similarly, the steady development in knowledge and the need to encourage career mobility for established research scientists calls for a special effort to give them continuous training or enable them to acquire new training opening up additional career or job prospects (moving from university to industry for example) It will be easier to take these needs into account through the increasing number of "training" resources and personnel which will become available due to the declining number of young people entering higher education as a result of current European demographic trends

In overall terms, Community programmes such as COMETT or ERASMUS have or will have a major role to play in developing the education and training of young Europeans, particularly in conjunction with industry. Supplementing and reinforcing these activities, in the specific field of research and development, the incentive measures under the "Stimulation Action" can, within the limits of available resources, introduce a "European dimension" in the training of research scientists and their employment in national research and development systems, because of their transnational nature they also have the advantage of familiarizing scientists with different and complementary methods and approaches, giving them wider experience and widening the range of R&D opportunities open to them and thus giving them the opportunity to undertake research work better suited to their creativity. These measures also

1) The prospects of a young research assistant obtaining a permanent job have declined from 70% in the 1960s to about 15% in the following decades (see employment prospects and mobility of scientists in Europe - ESF 1980).

give them an opportunity to get to know scientists from different countries, which can very often lead on to fruitful cooperation.

Finally, these incentive measures will also encourage the faster development of innovative ideas which, often at the frontier or interface of various scientific disciplines, require a broader cultural area than that of a single country.

More than 120 bursaries and research grants were awarded in each of the years 1985 and 1986. Whilst such a number is already quite significant it shows up the extent to which major efforts are still needed to give the Community system a better response to its needs. (It should be remembered that in one field of R&D alone, that of molecular biology, more than 370 bursaries were needed and awarded by EMBO (2) in 1986. Under the new SCIFNCE plan, the Commission intends to develop the plan launched in 1985, the objective being that the Community should have a specific system of European grants forming a significant complement to similar national or international activities carried on elsewhere

- c) Opening-up of the European scientific area promotion of cross-frontier mobility and the setting-up of intra-European cooperation and interchange networks.

It is acknowledged that the various barriers in the European R&D system, which bring about a reduction in the effectiveness of European research are major obstacles to scientific and technical progress in Europe.

Wastage of energy and resources, fragmented and scattered research and results are hampering the Community R&D effort. The all too frequent "walls" between disciplines, between institutions (public, industrial) and between national systems result in a lack of fluidity, difficulties in exchanges (of men and ideas) and in the implementation of intra-European cooperation. These are well-known facts and have

2) EMBO European Molecular Biology Organisation (cf. report of Activity 1986.)

induced the European countries to combine their efforts either at Community level (shared-cost programmes, concerted-action projects, cooperation in innovation and technology transfer : SPRINT) or in the wider framework of the COST agreements, or lastly in EUREKA so far as activities closer to the market are concerned.

These barriers are all the more harmful in that modern science and technology increasingly require a multisectoral and multidisciplinary approach which has great difficulty in developing in this "walled-off" system. At the same time the fragmentation of the system all too often prevents the attainment of a "critical mass", especially within a single country.

In that situation the Community has a vital role to play in helping European research scientists to overcome these difficulties which impede their creativity. Both the Council and Parliament have on many occasions acknowledged the value of a specific Community campaign complementary to the activities undertaken at national and international level.

On the basis of this experience the Commission proposes in the new "SCIENCE" plan to continue along similar lines whilst stepping up its efforts so as to involve more people and research teams, especially from the area of industrial research. Hoping in the long run to involve 5% of European research scientists in cooperation and interchange networks and since 0,6% were involved by the end of 1987, the Commission considers that the objective of between 1 5% and 2% should be adopted for the SCIENCE plan. Whilst up to now two thirds of researchers who presented high quality projects have been unable to obtain Community support because of lack of resources, the setting of this objective should make it possible to respond more satisfactorily to the needs of this type which will be expressed.

All such efforts to promote the mobility of researchers will be ineffective if Member States continue to use the rules governing entry to the public service as an obstacle to the recruitment of researchers bearing the nationality of another Member State. It is for this reason that the Commission, in applying European Court judgements, is determined to make sure that the principle of prohibiting discrimination on the grounds of nationality is respected.

II 2. Scope

a) Countries involved

The SCIENCE plan is of course intended to cover all twelve Community Member States. To ensure that intra-European science cooperation can benefit to the maximum from the dimensions of "SCIENCE Europe" which cannot be regarded as stopping at the Community's frontiers, it is desirable for non-Community countries, especially in Europe, to be associated with the Community stimulation activities. In March 1985 the Commission received a brief to start negotiations for that purpose with non-Community European countries. It has therefore initiated negotiations with many applicant countries from EFTA (Austria, Finland, Iceland, Norway, Sweden and Switzerland).

The Commission intends to continue these negotiations on the association of interested countries by concluding specific association agreements.

b) Scientific scope

By its nature a "European scientific area" implies that cooperation and interchange can take place whatever the discipline and activity concerned. However, although acknowledging the need to take action in all scientific fields, the Commission considers it advisable to design separate stimulation plans for the exact sciences and for other sciences. So far as the latter are concerned, the Commission, as already indicated in the exchanges of views on the Framework programme 1987-1991 will soon make concrete proposals for launching a similar action in the field of economic sciences which is considered to be of priority among the other sciences in following the guidelines contained in annex II.

The SCIENCE plan proposed here therefore confines itself to covering all fields of the exact and natural sciences. This plan should also be applicable to all forms of R&D, basic research and applied research or development, and to all the bodies involved in such activities, whether public or private.

Although the Commission considers it essential to guarantee the greatest possible measure of freedom and flexibility in an activity designed to strengthen the efficacy of European research and development, of whatever kind, it nevertheless feels obliged to recommend, on the basis of the analyses carried out with the assistance of CODEST, as well as certain work carried out in the framework of FAST, that special attention be given to a few typical fields or problems. The list of subjects given below should not be regarded as exhaustive or exclusive, but rather as a range of examples. It covers fields in which stimulation activities should certainly help to strengthen the Community's position, but the choice of Commission assistance, whatever the subject concerned, should be based solely on a case-by-case evaluation of requests for cooperation and/or interchange

The following fields may therefore be regarded as particularly suitable to benefit from the Stimulation Plan given their transdisciplinary and multi-sectoral character .

- mathematics
- physics
- chemistry
- life sciences
- earth and ocean sciences
- scientific instrumentation
- engineering sciences fluid and solid mechanics

II 3. Selection criteria for assistance

The very scope of the field of Community action means that particularly strict selection criteria have to be applied in order to concentrate the effort and ensure maximum efficiency. Four major criteria will be taken into account in selecting applications that could be given Community support :

- Quality must be regarded as the primordial criterion - quality from the scientific and/or technical aspect (originality, feasibility, difficulty, interest) and quality as regards the interest to the Community or the value that could be added by the European dimension The quality of the

teams making the proposal should also be a factor in its assessment

- Selectivity : the scope of the requirements is such that the Community resources will probably not be sufficient to meet the expectations of European scientists. (For example only 346 applications could be accepted in 1985 and 1986 from the 575 recognized as being of high quality). Where the quality is equivalent, priority will therefore have to be given to applications that are of particular interest because of their inter- or multidisciplinary content, their potential impact in bringing about the "single science market", their urgency and/or the certainty that they will be abandoned if no Community stimulation support is given.
- Consistency with Community R&D projects being conducted elsewhere. In fields where such projects are under way stimulation support could be envisaged to supplement them, to prepare for their launching or to take rapid advantage of an emerging opportunity that could not be exploited within a programme (it is in this way that close links have been forged between stimulation projects and programmes such as Brite, Esprit, Biotechnology, Environment and Euram), however, stimulation support cannot be given to projects which under a different guise have already received Community support or were not considered to be of high enough quality
- Impact on the Community's harmonious scientific and technical development by associating all the Member States of the Community in the Stimulation Action as a whole. This will in particular make it possible to strengthen the scientific potential of less favoured Member States by obtaining extra resources for them, particularly in human terms, with the possibility to return to their home countries being offered to certain scientists working abroad and more than anything else the benefit they will gain from the interchange of expertise and results

II 4. Implementation of the SCIENCE plan.

1) Lines of action.

The Stimulation of European scientific and technical cooperation and interchange calls for a number of procedures ensuring optimum satisfaction, in a

flexible, rapid and realistic manner, of the requirements and expectations of the circles concerned (industry and public bodies). In the light of experience gained since 1983 and the evaluations carried out in 1984 and 1986, it seems that three types of measure should be adopted

a. Bursaries - research grants - advanced training courses.

Encouragement of the training and specialization of young scientists of whatever level, for their employment in the research world, whether public or private, and for intra-European mobility of research scientists, whether established or just starting on their careers, may be given by a system of bursaries, research grants and subsidies for high-level courses.

As a specifically R&D orientated supplement to the Commission's activities under the COMETT and ERASMUS programme for the training of young people in all other fields, the bursaries offered under the SCIENCE plan enable scientists to complete their training or to carry out, in an EEC country other than their own, research which could not be done without Commission assistance. A bursary contract therefore means a financial award to research scientists at various levels to enable them to acquire additional training, to disseminate and exploit their knowledge by taking part in research abroad, within the Community or in non-Member countries associated with the Community under the Stimulation Plan. The research grant is intended to allow a research scientist to be recruited by or seconded to a country other than his own (in the Community) for periods of varying length. Depending on the type of scientists and the purpose of the research allocation (which is awarded to the host laboratory taking in the foreign researcher), it may take different forms

- funding to enable a research scientist to make short stays (from 15 days to 6 months) in a foreign country within the Community to

complete specific experiments requiring particular facilities not available in his own country,

- funding to cover the costs associated with mobility (travel, subsistence, removal, etc), the research work and possibly the salary of a scientist seconded to or incorporated in a research team in a country (in the Community) other than his own, for a period of at least six months and at most three years,
- funding to cover the costs associated with the mobility and research work of a young scientist taken on in industry, who goes to follow lengthy training (from one to three years) in a public laboratory in a foreign country (within the Community), in this case the salary and similar costs are paid by the industrial employer,

Finally, the need for permanent upgrading of the knowledge of research scientists or their refresher training, especially in fast-developing advanced areas, can be met by granting subsidies to bodies offering temporary high-level courses, as provided for in the framework of ESPRIT II. The main aim of the financial allocation in this case is to cover the travel and subsistence costs of European scientists participating in and/or attending such courses.

The general system of bursaries, research grants and training subsidies is to be implemented not only under the SCIENCE plan but also under all the Community R&D programmes. Whilst the management of the whole system is centralised the financing of these measures will be of differing provenance coming from :

- The SCIENCE plan, in any fields in which there are no Community programmes for R&D activities or for any support of a multisectoral nature.
- Within Community sectoral R&D programmes for the fields they cover, when the decision

adopting the programme so allows, in agreement with the relevant Management and Coordination Committee (CGC) and the services concerned The Commission has already taken this course with the system of sectoral grants defined in the 1985-1988 Stimulation Plan. Henceforth the use of these types of measures will have to be extended and applied systematically in all Community R&D programmes

b. Laboratory twinings - Operations contracts

The bringing together of scattered teams so that they can, especially in advanced fields, jointly attain the necessary critical size, the setting-up of trans-European cooperation networks, both multisectoral and multidisciplinary can be encouraged by using the two forms of support that have proved their effectiveness since 1983

- laboratory twinning contracts
- operations contracts

The Commission will therefore make use of these two procedures to promote and encourage scientific and technical cooperation

In the case of a twinning contract, the Community support awarded to the associated teams covers the costs incurred in meetings of the research scientists involved, the carrying-out of joint experiments and exchanges with other teams and dissemination of results, where appropriate it allows young scientists to be taken on temporarily to strengthen the teams concerned and for the necessary supplementary equipment to be provided to the associated partners.

Operations contracts are in fact a particular type of twinning since the teams from various Community countries associated in a contract undertake jointly to attain a precise objective within a given time. An "operation" can therefore be regarded as a "mission-oriented twinning"

representing rapid multisectoral action to be taken in response to scientific and/or technical challenges (or in preparation for a continuous action programme).

The Community contribution granted under an operations contract covers expenditure of the same type as in the case of twinning, the difference lying essentially in the level of financing granted, and the opportunities for the provision of equipment.

c. Contextual measures to encourage mobility of research scientists

Alongside these incentive measures, the Commission intends to continue its work on regulatory-type measures to help overcome the difficulties involved in the mobility of research scientists (social security coverage, pensions, etc.) and the movement of scientific equipment across frontiers

The various measures intended to tackle these problems are now being defined and will be set out in a full scale action plan to promote a Researchers' Europe

In addition, the Commission may support initiatives, apart from those now underway or scheduled such as EUROGUICHETS and CORDATE, aimed at implementing an information system giving all Community researchers details of exchange and/or cooperation opportunities available in any Community laboratory.

II. 4 2. Implementation

a Incentive measures (bursaries, research grants, subsidies, twinning, operations contracts)

The implementation of these measures is based essentially on a dual system of evaluation centring on the Committee for European Development of Science and Technology (CODEST) which will provide for the review of applications for assistance and ensure consistency with other Community activities

- a system of scientific referees outside the Commission (peer review system) to evaluate the projects submitted, enabling the Commission to benefit from the expertise of approximately 2,200 experts in all disciplines selected and regulated by CODEST who have agreed to evaluate the projects anonymously and free of charge,
- a system of referees within the Commission consisting of scientists responsible for Community programmes who assess the value of the projects and their consistency with the programmed activities

The existing system - high-level advisory committee, network of anonymous referees, small Community administrative unit, decentralized management of projects - has already proved its efficiency, flexibility and suitability for the objectives set. Essentially, therefore, it should be maintained and improved in the future while at the same time being further and continuously adapted in order to preserve maximum effectiveness (for example by making use of decentralised project management for projects involving a large number of partners).

b Contextual measures

Since 1984 the Commission has worked in close cooperation on this subject with the Council of Europe and the European Science Foundation (research scientists card, career endorsements for research scientists who have worked abroad, European doctorate, transfers of scientific equipment throughout Europe). It will continue to seek the assistance and support of these bodies for the precise definition of the regulatory measures to be taken and then, after a Community decision, for their implementation.

II. 5 Evaluation of activities

Apart from the continuing evaluation of results obtained in the framework of supported projects, which is carried out by CODEST and, where appropriate, by independent specialists, an overall assessment of the work being done, its impact and the scientific and/or technical value of the results obtained will be performed on a regular basis.

As in 1984 and in 1986, the job of making an overall assessment of this kind will be entrusted to a group of independent experts in accordance with arrangements agreed by the Council and the Commission for evaluating Community R&D activities (cf. COM(86)660 final).

As a first estimate it would appear at this point that a sum of the order of 200,000 ECUs will be needed to evaluate the SCIENCE plan

This dual evaluation system makes it possible to guarantee that supervision of the action and assessment of the results is rigorous and indeed this is a major factor in the success of the whole scheme

II. 6. Partners

The SCIENCE plan, with its main aim of opening up the European scientific area, is of interest to any research group whether in the public sector or in industry. Any research team can therefore benefit from Community stimulation support together with another team of whatever type within the Community.

So far applications for assistance have been received almost exclusively from university and semi-public research bodies. It should be noted however that on many occasions, without being directly involved in projects, industrial circles have expressed interest in "Stimulation" projects to which they wished to be associated so far as dissemination of results was concerned. The Commission therefore intends to step up the information campaign which it has already launched to alert industry, and in particular small and medium-sized firms, to the opportunities available to them in the Community to strengthen their research and innovation capacity

III. Scale - Necessary resources

1. Dimensions

As the Commission has stressed on several occasions, the need to strengthen the Community's scientific and technical competitiveness in a unified scientific area calls for a wide ranging Community effort in order to respond to the wish expressed by European researchers themselves to collaborate within the Community and the needs which must be met in order for this to happen. In this respect a survey undertaken on the Commission's behalf by the European Science Foundation ("The Community of Science in Europe" 1986) showed that 95% of

European scientists wanted to be able to develop their cooperation and interchange with European colleagues, and considered that this was essential if the effectiveness of European R&D were to be reinforced.

Initiatives taken by European researchers in the framework of projects financed by the Stimulation Action such as CEAM (the Concerted European Action on Magnets), Eurocamarge (study of the continental shelf) or the Geotraverse (continental geology) programme originally defined by the European Science Foundation, EJOB (European Joint Optical Bistability project) and, recently, BRAIN (Basic Research in Adaptive Intelligence and Neurocomputing) have brought together hundreds of scientists and made it possible for Europe to maintain a leading position in world terms. At the same time those projects under way for some time (or, like EJOB, finished) have shown that the judgement made during the Foundation survey was sound.

With the resources made available in the framework of the 1985-1988 plan some 3,000 researchers will have been involved by the end of 1987 at the completion of the four years of activity 1984-1987. This figure is indicative of the impact of the action that has been carried out. It should however be regarded in the perspective of the fact that in four years some 6,800 European researchers emigrated to the United States (1982-1985) and that in 1985, 9% of the scientific and technical personnel employed in American industry was of Community origin (Source National Science Foundation - "Immigrant scientists and engineers" - NSF 85-326 and 1985).

While one programme alone that has been designed in the US, (SDI) is going to mobilise thousands of researchers and engineers including European ones, without there being any equivalent programme in Europe it would seem clear that it is increasingly urgent and necessary to make available to European scientific and technical circles the resources to both make possible and encourage intra-european cooperation on new problem areas. Whilst 2,550 researchers participated in such collaborations by May 1987, more than 14,000 scientists were involved by the same date in the 1,275 requests for support put forward since 1984 with more than 50% having been connected with projects classified as excellent quality. So somewhere around 7,000 researchers and engineers could have taken part in "high quality" European interchanges or cooperations - and the possibilities opened up by this still relatively recent activity are still not familiar to all European scientists.

The urgency and importance of the issue have led the Commission to propose a significant qualitative and

quantitative leap forward for the period 1988-1992. Therefore the Commission considers that the SCIENCE plan should be of a scale enabling between 7,000 and 8,000 researchers (full time equivalent) to be supported.

2 Resources.

In proposing the 1985-1988 Stimulation Plan (see COM(84)215 final), the Commission stated that the funds needed to attain the objective in any plan of this type would depend on the actual level of the costs involved in transfers of scientists and in scientific and technical cooperation.

Two years after the launching of the 1985-1988 Stimulation Plan, the Commission is now able to put a figure on the average cost of stimulation support based on hundreds of cases, it is 1,000 ECUs per research scientist (full time equivalent) involved per month. This is the average cost of stimulation support which, in most cases, only covers the extra costs brought on by a transnational cooperation and the "upgrading" needs of the resources possessed by the partners who come together in a joint project.

It can therefore be estimated that an amount of 167 MioECU would be needed for the SCIENCE plan for the period 1988-1992 if the desired objective of approximately 1 5% of research scientists is to be achieved in 1992.

At the same time the Commission will, by means of new financial mechanisms whose development it will encourage, finance transnational cooperative projects which take the form of following up the pre-competitive research work undertaken in this plan.

IV Conclusions

The evaluations conducted in 1984 and 1986 and the review conference of 5-6 May 1986, together with the results of activities carried out to date, confirm that the Stimulation Plan meets a vital need by filling a gap harmful to the scientific and technical creativity and vitality of the Community.

Consequently the Commission is proposing the attached draft decision to the Council and requesting it to agree to the text so that action on a scale appropriate to Community requirements can be launched as quickly as possible.

Annex I

PROPOSAL FOR A COUNCIL REGULATION

adopting a plan to stimulate the international cooperation
and interchange needed by European research scientists
1988-1992

(SCIENCE)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic
Community, and in particular Article 130Q, (2) thereof,

Having regard to the proposal from the Commission (1),

In cooperation with the European Parliament (2),

Having regard to the Opinion of the Economic and Social
Committee (3),

1) OJ n°

2) OJ No

3) OJ No

Whereas Article 130 K of the Treaty provides that implementation of the Framework programme be carried out by means of specific programmes developed within each activity, whereas the Council by its Decision of adopting the multiannual Framework Programme 1987-1991 approved the activity aimed at bringing about a Researchers Europe,

Whereas the Scientific and Technical Research Committee (CREST) has been consulted on the following measures,

HAS ADOPTED THIS REGULATION

Article 1

A plan to stimulate the international cooperation and interchange needed by European research scientists, hereinafter referred to as the "Stimulation Plan", as set out in the Annex, is hereby adopted for a five-year period commencing on 1 January 1988

Article 2

The Stimulation Plan consists of a range of activities which have as their aim the establishment of a network of scientific and technical cooperation and interchange at European level, which will gradually be extended. It covers all fields of science and technology (the exact and natural sciences) However, in choosing activities to be supported, particular attention shall be given to the areas set out in the Annex in view of their special interest.

Article 3

The funds estimated to be necessary for the execution of the Stimulation Plan amount to 167 million ECU, including expenditure on a staff of 18.

Article 4

The Commission shall undertake the implementation of the Stimulation Plan by means of bursaries, research allocations, grants for high-level courses, contracts encouraging the twinning of laboratories and operations contracts. It shall be assisted by the Committee for the European Development of Science and Technology (CODEST), set up under Commission Decision 82/835/EEC (4), and by consultants

4) OJ n° L350 of 10.12.1982, p. 45

Article 5

The Commission shall negotiate and conclude the contracts needed to implement the selected projects. To this end it shall draw up contracts showing the rights and obligations of each party, particularly the methods of disseminating, protecting and exploiting the research results and of making any reimbursement that may be necessary of the funding given

Article 6

In implementing the Stimulation Plan, the commission is hereby authorized to negotiate agreements for cooperation with third countries, in particular those involved in European cooperation in the field of scientific and technical research (COST), and with international organisations with a view to associating them wholly or partly with the Plan

Article 7

This Regulation shall enter into force on the third day following its publication in the OJ of the EC

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Council

The President

Annex (I .a)PLAN TO STIMULATE THE INTERNATIONAL SCIENTIFIC COOPERATION AND INTERCHANGE NEEDED BY EUROPEAN RESEARCH SCIENTISTS (1988-1992).

1. The stimulation plan takes the form of a range of measures to aid the training and mobility of researchers, communication among scientists and the development of cooperation in the field of research and development in the Community. These are therefore support measures for research scientists, teams or research and development organizations to ensure the harmonious scientific and technical development of the Community by facilitating :
 - training through research and the recruitment of young research scientists in Community laboratories,
 - transfers of researchers (whether novice or experienced) from one Community country to another,
 - the bringing together, on joint projects, of expertise which is geographically scattered in the Community, in order to make it possible to undertake scientific and technical work for which it is necessary to bring together complementary resources which exist in various Member States.
 - the strengthening of communication and exchanges of information within the European scientific and technical system.
2. Measures to stimulate interchange and cooperation apply to all fields relevant to the exact and natural sciences; the following will be given special attention :
 - mathematics
 - physics
 - chemistry
 - life sciences
 - earth sciences and ocean sciences
 - scientific instrumentation
 - engineering sciences.
3. In the fields in which support will be granted, multinational projects to benefit from the Community support measures will be chosen on the basis of their quality, the extent to which they are multidisciplinary in content, their innovative aspects and their value in terms of breaking down barriers between different forms of research and development.

4. The Stimulation Plan will be implemented by making use of :

- multisectoral incentive measures : bursaries, research grants, subsidies, laboratory twinings, operations contracts;
- sectoral incentive measures; bursaries research grants and subsidies financed in the framework of each of the community research and development programmes following the agreement of the appropriate Management and Coordination Committee (CGC).

5. The choice of stimulation incentive measures and the teams concerned will be made by the Commission which, with the help of the Committee for the European Development of Science and Technology (CODEST), will make use of a peer review system. The Commission will see to it that there is consistency between the stimulation activity and programmed Community RD activities.

6. The Commission will at the same time undertake a series of consultations, surveys and seminars with the cooperation of Community scientific and technical circles in order to analyse and evaluate scientific and technical needs and opportunities, with the aim of providing more detail to the content of the Stimulation Plan.

The Commission will cooperate closely with the national authorities to ensure consistency between these activities and national policies on research stimulation.

7. In order to evaluate the scientific and/or technical quality of requests for support, as well as to analyse scientific and technical opportunities and needs or to assess projects which have been financed or the activity itself, the Commission may call upon expertise from outside its own staff.

Annex II

Programme for stimulation of European cooperation and exchanges in
Economic Science

The objective is to help the Community's potential in the economic sciences to be fully exploited, and in particular attain the highest level of international competitiveness. While the Community's human resources in economic science are very considerable, there is no doubt that presently the United States occupies a dominating position with several centres of excellence of international standing. Moreover, many leading economists in Western Europe see in these centres of excellence in North America the principal international dimension to their professional activity, with intra-European links occupying a lesser role despite advantages of closer proximity, etc.

The economics profession has recently been taking steps to establish first elements of professional organisation at the European level, for example: foundation in the last few years of the European Economics Association, the Centre for Economic Policy Research and the Centre for European Policy Studies, and establishment between centres of excellence in Belgium, Germany and the United Kingdom of joint programmes for doctorates in economics. However, these initiatives are still at an early stage of development and in most cases even quite insecure financially. Some recent initiatives of the European Communities will or could also help widen the possibilities for helping the economic sciences, notably the ERASMUS programme which aims at facilitating the mobility of students and teachers in higher education.

These recent initiatives show that a programme to strengthen the economic sciences at the European level is likely to find an extremely positive response on the part of the profession. What is needed now is a critical mass of European-level activity in the economic sciences at the highest level of professional standing to persuade the younger and forthcoming generations of European economists to turn their interests more towards intra-European cooperation and research efforts; and for some of Europe's best young economists, now established in North American centres of excellence, to be persuaded to return. Some elements of the programme should have these people in mind.

The programme would consist of the following actions:

- (1) bourses for European doctorates, requiring part of the doctoral studies to be undertaken in a second country;
- (2) bourses for post-doctoral research fellowships, to be offered to Community nationals from a different country to that of the institution, or to Community nationals returning from non-European institutions;

- (3) grants for research projects or networks of European interest;
- (4) financial support for information networks, including data-banks and documentation.

The criteria that requests for bourses and research grants should meet would be the following:

- (a) scientific excellence;
- (b) the substance of the research should be of European-level interest;
- (c) there should be a multi-national European aspect to the organisation of the project (multi-national participation, or activity outside country of nationality).

The economic sciences, like the natural sciences, can profit greatly from the establishment of research networks. Research institutions specialising in the building of multiple networks have demonstrated their value in the economic as well as natural sciences, exploiting economies of scale in communication between scientists. Such organisations should be eligible for support, but by no means exclusively.

The strength of some of the northern European countries outside the Community is very considerable in the economic sciences. The programme should be open to requests by such countries to participate, on the basis of financing keys for which there are already precedents (through association agreements with the individual countries) in the Community's framework programmes for research.

The programme would cost about 6 million ECU in total for the four years 1989 to 1992, starting at a level of about 1 million ECU, rising to 2 million ECU. Preliminary activities in 1988 would be financed under line 7302 of the budget. Definition of the programme and selection of projects would benefit from the advice of a consultative committee of eminent economists.

Financial record

1. Budget line : 7301

1. Title of the project.

Plan to stimulate the international cooperation and interchange needed by European research scientists.

2. Legal basis

Article 130 Q paragraph 2 of the Single European Act.

3. Description of the project

The Stimulation Plan consists of carrying out various incentive measures, i.e. :

- Bursaries

Financial support granted to young scientists to enable them to acquire additional training by participating in a research project in a laboratory in a Community country other than their own for a period of at least 12 months and at most 24 months.

- Research grants

These cover the cost of the transfer or secondment of a research scientists from one Community country to another, either to allow a young scientist to be taken on in a team in a country other than his own or to enable a young science graduate to specialize before joining a university or industrial research laboratory.

Depending on the type of scientist and the purpose of the research allocation, it may take different forms :

- funding to enable a research scientist to make short stays (from 15 days to two months) in a foreign country within the Community to carry out specific experiments in a particular scientific or technical facility not available in his own country;

- funding to cover the costs associated with mobility (travel, subsistence, insurance, removal, etc.), the research work and possibly the salary of a scientist seconded to or incorporated in a research team in a country (in the Community) other than his own, for a period of at least six months and at most three years;
 - funding to cover the costs associated with the mobility and research work of a young scientist taken on in industry, who goes to follow a lengthy training course (from one to three years) in a public sector laboratory in a foreign country (within the Community);
 - subsidies for high-level training courses : financial support granted to a body offering a specialized high-level course so that it can accept scientists from different Community Member States to give them additional training or enable them to retrain for other functions.
- Twinning of laboratories in different countries

This enables researchers who are working in isolation in an advanced field in several Community countries to bring their effort together, without coming into one laboratory, and thus encouraging the formation of a research team exceeding the necessary "critical size". Funding is granted to allow the researchers to meet, to carry out joint experiments, to exchange results, to add to their equipment or to strengthen their teams by temporarily taking on other scientists, preferably from a different country.

- Development of multidisciplinary, multinational operations

This would, by means of development contracts, make it possible to bring together the best expertise available in different countries and disciplines in order to achieve a predetermined objective or jointly to undertake prespecified scientific research within a scientific and technical cooperation network.

4. Justification for the project

On 9 November 1981 the Council asked the Commission to submit practical proposals for stimulating the efficacy of the European research system and for promoting mobility amongst researchers.

The European Council, meeting on 26 and 27 November 1981, confirmed these requests.

At its meeting on 28 June 1983 the Council adopted an experimental phase intended to enable specific ways and means for this project to be tried out.

On 28 June 1983 the Council also approved the goal "improving the efficacy of the Community scientific and technical potential" for inclusion in the Framework programme for Community R&D activities.

On 28 February 1984 the Council invited the Commission to put forward a plan to stimulate European cooperation and scientific and technical interchange over the period 1985-1988.

On 12 March 1985 the Council adopted a stimulation plan 1985-1988.

The Single European Act stipulates (Article 130 G) that the Community shall carry out activities to stimulate the training and mobility of researchers in the Community.

At its meeting on ... the Council approved the objective "Researchers Europe" amongst those included in the 1987-1991 Framework programme for Community R&D activities.

5. Financial implications

1. Nature of the expenditure

- bursaries
- expert contracts
- research grants
- subsidies
- laboratory twinings
- development contracts for multidisciplinary, multinational work intended to achieve specific results
- surveys, studies, conferences
- implementation of accompanying contextual measures, information and documentation system in particular.

2. Total cost

167 MioECUs for the period of validity of the Stimulation Plan (1988-1992).

3. Method of calculation

a) Staff expenditure

A staff of 18 is proposed for this plan (10 A, 3 B, 5 C) of which 13 (8 A, 2 B, 3 C) come from the ongoing programme, and 3 (1 A, 1 B, 1 C) would be recruited in 1988 and 2 (1 A, 1 C) would be recruited in 1989; The annual cost of personnel allocated to the programme (including missions, specific experts etc.) is estimated to be 170,000 Ecus in 1988, 1,430,000 Ecus in 1989, 1,600,000 in 1990, 1,700,000 Ecus in 1991, 1,800,000 Ecus in 1992, hence 6,700,000 Ecus overall for the whole period.

b) Operating costs of CODEST and the network of consultants

Methodological evaluation of the system.

These costs are estimated to be 2,200,000 for 1988-1992, made up principally of the expenses of organizing meetings and administrative support.

c) Expenditure on contracts

The estimated amount is 158,100,000 Ecus to be spent on the activities carried out over the period 1988-1992.

Multiannual expenditure timetable

Commitments	execution	execution	budget +	APB	prevision	prevision	prevision	prevision	prevision	prevision	TOTAL
	1985	1986	subsid. 1987	1988	1989	1990	1991	1992	1993	1994	
ONGOING PROGRAMME											
Total	15.458	18.729	19.813	6.000							60.000
PROPOSED NEW PROGRAMME											
Personnel (1+9)				.170	1.430	1.600	1.700	1.800			6.700
Administration (2+3)				.050	.500	.520	.550	.580			2.200
Contracts (5)				24.780	33.070	33.880	33.750	32.620			158.100
Total				25.000	35.000	36.000	36.000	35.000			167.000

PAYMENTS	execution	execution	budget +	AFB	prevision	prevision	prevision	prevision	prevision	prevision	TOTAL
	1985	1986	reports 1987	1988	1989	1990	1991	1992	1993	1994	
ONGOING PROGRAMME											
Total	.551	7.430	22.268	9.760	15.268	2.886	1.837				60.000
PROPOSED NEW PROGRAMME											
Personnel (1+9)				.170	1.430	1.600	1.700	1.800			6.700
Administration (2+3)				.050	.500	.520	.550	.580			2.200
Contracts(5)				4.480	15.070	26.880	28.750	30.620	33.000	19.300	158.100
Total				4.700	17.000	29.000	31.000	33.000	33.000	19.300	167.000

4. Financing of expenditure

Appropriations to be entered under the budgets for 1988, 1989, 1991, 1992, 1993 and 1994.

5. Control

- a) Financial control : to be undertaken by the relevant Commission departments, in particular by the DG for Financial Control, to ensure that the expenditure has been incurred in a regular and correct manner;
- b) Scientific control : to be undertaken by the relevant Commission departments, the Scientific Advisory Committee (CODEST), and in accordance with the general procedures for the evaluation of Community R&D activities.

SCIENCE PLAN
SME IMPACT ASSESSMENT

Subject : Plan to Stimulate the Cooperation and Interchange
Needed by European Researchers.

1) ADMINISTRATIVE CONSTRAINTS FOR ENTERPRISES

There have never been any constraints on involvement in the Stimulation Action of SMEs to whom the procedures which have been developed are particularly well suited.

2) ADVANTAGES FOR ENTERPRISES

All partners in a Stimulation project are treated equally, each receiving contracts to cover 100% of expenses incurred in the collaboration. All results belong to the partners equally, and the process of disseminating results from other projects will be of particular value to participating SMEs. The speed of response and the flexibility of support methods which are particular characteristics of the Stimulation Action make it able to meet SMEs special requirements. SMEs have a particular interest in improving their technological base through collaboration, perhaps with universities, and the Stimulation Action offers an easily accessible means to achieve it.

3) DISADVANTAGES TO ENTERPRISES

The high level of unsuccessful proposals occasioned by the striking mismatch of resources available to demand expressed up to now has meant that many applicants, SMEs included, have gone to the expenses of preparing requests in vain. This disadvantage should ease if a more appropriate level of resources is made available.

4) EFFECTS ON EMPLOYMENT

More than 350 young researchers have had training or specialisation opportunities in a Member State other than their own thanks to the Stimulation Action, which would not otherwise have been possible. Of the 346 projects so far supported employment opportunities have been created in more than half. One important effect of the mobility which has been created by the Stimulation Action has been to create temporary vacancies (over 100 to date), which can be filled locally by academic or industrial researchers requiring work experience.

5) CONSULTATION WITH SOCIAL PARTNERS

The Communication will be submitted to the Economic and Social Committee, whose opinions and views on earlier phases were a valuable source of industrially orientated modifications to support methods and contextual measures set out in this Communication.

6) ALTERNATIVE APPROACHES

In Community terms the alternatives are either the relatively inflexible sectoral programme approach which constrains the field of activity at the level of participation (maximum 50% support for industry for example) or purely national or bilateral approaches at national level. The Stimulation Action is designed to respond to genuine requirements for the encouragement of collaborative research and the deployment of the European dimension, as expressed in various studies, surveys, etc. by European scientific and technological circles themselves. The Stimulation Action is widely accepted as the most appropriate mechanism for tapping Europe's scientific and technical potential both at academic and at industrial level.