



SCIENCE
RESEARCH
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RTD *info* | 16

August-September 97

Research without Frontiers



Europe and international cooperation

Europe and international cooperation

Biology

- “Vaccine plants”: a world first
- Molecular tools,
a lifeline for biodiversity



RTD info 16

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Directorate General XII - Science, Research and Development
Mrs Edith CRESSON, Commissioner for research, innovation, education, training and youth

RTD Info is a newsletter on research and technological development supported by the European Union. It covers general aspects of Community research such as project results and research policy, as well as practical information including dates of calls for proposals, events, conferences, publications, and so on. RTD Info is aimed not only at current and potential participants in Community research programmes, but also at a wider public of industrialists, decision-makers, students, and others who are interested in developments in European research. Published quarterly, RTD Info is available in English, French and German. Subscription is free. To subscribe, fill in the form below.

RTD Info is also available on-line on the European Commission's EUROPA server at:

<http://europa.eu.int/en/comm/dg12/rtdinfo.html>

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French: <http://europa.eu.int/pol/rd/fr/rd.htm>

English: <http://europa.eu.int/pol/rd/en/rd.htm>

German: <http://europa.eu.int/pol/rd/de/rd.htm>

48,000 copies of this issue have been printed.

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Research without Frontiers

A success for European research

Among the results of the Amsterdam European Summit, there is one that will be of special interest to all those concerned with European research, and to readers of RTD Info in particular. During the summit, Member States' representatives decided that, in its co-decision procedure with the European Parliament, the Council of Ministers would in future adopt the RTD Framework Programme by a qualified majority vote instead of a unanimous vote as in the past. In recent months, I have missed no opportunity to emphasise how essential and urgent such a decision is in ensuring the vitality and coherence of European research. Leaving the technical aspects aside, the move will enable the Union to implement a Framework Programme that goes beyond a mere aggregate of national and sectoral priorities, and to take full advantage of this unique instrument's strategic potential. Even though the new Treaty must still be ratified by the Member States, I am convinced that this decision will give a new impetus to the on-going negotiations on the Fifth Framework Programme. What was accomplished in Amsterdam - I am delighted to say - is a decisive step forward for European research.



Edith Cresson

Commissioner for research, innovation, education, training and youth

Scientific research and technology are becoming increasingly internationalised... and for many reasons. The information society and a general move towards globalisation mean that researchers may now exchange information and expertise as never before. New centres for research are emerging in various parts of the globe. Issues critical to man's future - health, food, the environment - are assuming a world-wide dimension. The great challenges of tomorrow - in terms of space, sustainable energy policies and biotechnological mastery - involve prohibitive research costs that require international action.

Frontiers. The notion becomes blurred as soon as we talk about Europe. When we discuss science and technological progress, it's a stark incongruity. That is why Community research policy - as embodied in the Treaty itself - is fundamentally open to exchange with the rest of the world.

Such scientific and technological cooperation, with a vast array of partners, is vital. It enables the European Union to take an active part in targeting fields of future research while providing access to information on the research capacities, activities and priorities of other countries. It facilitates, in the spirit of mutual interest, the use of laboratories and facilities outside Europe. It also creates networks of scientific relationships with researchers from every cultural horizon, placing EU scientists at the heart of progress in the widest possible range of disciplines.

The resulting accumulation of knowledge and know-how helps reinforce the EU's scientific and technological base, and keeps it competitive, boosting Europe's chances for access to future markets and stimulating employment.



Affirming the international role of European research

In this context, the Fourth Framework Programme has given international cooperation in RTD its full meaning in two ways:

- by the innovative launch in 1994 of a specific programme on *Cooperation with third countries and international organisations*. This programme, christened "INCO", backs numerous research projects, bringing European and foreign partners together in a variety of fields;

- by making it possible for scientific and technical partners from all European countries, and, in some cases, non-European countries, to participate on a *project by project basis* (that is, without community funding) in various specific Framework Programme initiatives (transport, information technology, biotechnology, environment and climate, etc.).

INCO's strategy, aimed at giving extra added value to European research, is based on the principle of *mutual interest*. The programme was therefore carefully designed to target specific forms of cooperation tailored to suit the four main types of partners with whom RTD exchanges are most important.

Intra-European synergies

In parallel to the research sponsored by the Framework Programme, the European Union is taking part in other European fora for scientific and technological cooperation involving the active participation of not only EU Member States, but also countries outside the EU ⁽¹⁾.

■ Covering as it does a wide spectrum of scientific and technological sectors, COST (*European cooperation in the field of scientific and technological research*) is an interstate structure that has sought, since 1971, to develop dialogue among those conducting research activities at national level in 28 European countries. The European Union actively backs the development of COST, for which the secretariat is provided by the Council of Ministers and the European Commission.

■ Launched in 1985 to boost the competitiveness of European enterprise, Eureka brings



Eureka: research and applications

During the 15th Eureka Ministerial Conference in London on 18 and 19 June 1997 the decision was taken, at the initiative of Edith Cresson, to create a working group to reinforce the synergy between the European Union's Eureka projects and RTD programmes. The Commission, one of the initiative's 26 members, financially supports or has supported 36 projects since the creation of Eureka, in particular: JESSI (Joint European Submicron Silicon Initiative), a vast project in the micro-electronics sector (which gave rise to the current mobile telephone); COSINE, which drew up the common options on electronic communication standards, including X-400, and set up a computer communication network among European researchers; EUROTRAC, where some thirty partners (the JRC among them) demonstrated that in the Alps pollutants "creep" down mountain slopes with consequences for valley dwellers; and EUROMAR, an umbrella organisation for several projects designed to develop Europe's marine industry.

together 24 countries and the European Commission. It aims to promote the creation of partnerships between applied research teams, in the industrial and/or academic sector, who wish to cooperate in the field of advanced technology.

■ The European Union is also working in close cooperation with certain large international research organisations in specific research areas, such as the European Laboratory for Particle Physics (CERN, in Geneva), the European Molecular Biology La-

boratory (EMBL, in Heidelberg), the European Space Agency (ESA), etc.

Cooperation with non-European industrialised countries

The process of globalisation involves not only the realm of knowledge and know-how, but also that of trade and financial flows. If the scientific and technological spheres - so vital to Europe's competitiveness - are not fully involved in this vast international revolution, they may not survive for long. Although required for many reasons, the bolstering of international scientific and technological cooperation is essential if we are to

(1) Special "associated" cooperation status enables the three countries included in the *European Economic Area agreement* - Norway, Iceland and Liechtenstein - to take part in all programmes under the Fourth Framework Programme. A special association agreement is also being drawn up with Switzerland.

Discovering the Japanese approach to science

"Research is conducted in an entirely different spirit in Japan. In Europe, when we face a problem, we keep several solutions in mind. The Japanese, after long reflection, chose a single direction, and pursue it with a sort of relentless determination." During a year spent in the universities of Chiba and Kyoto, thanks to a European grant, Lieve Ongena, a doctor of biology at the university of Ghent (Belgium), and an expert on plant enzymes, pursued her work on a toxin derived from a particularly drought-resistant species of pea, while familiarising herself at first hand with Japanese scientific culture. In the biotechnology company where she now works, she is responsible for relations with Japanese customers. "I speak their language, which creates a relationship of trust; but, more importantly, I know how they think and understand their demands."



Lieve Ongena

Japan/Korea science and technology grant programme

react to current threats to the environment - and define new industrial approaches in response. Furthermore, the growing need to share human, technical and financial resources required by innovation linked to ever more sophisticated knowledge and technology, makes it even more vital for us to step up cross-border cooperation.

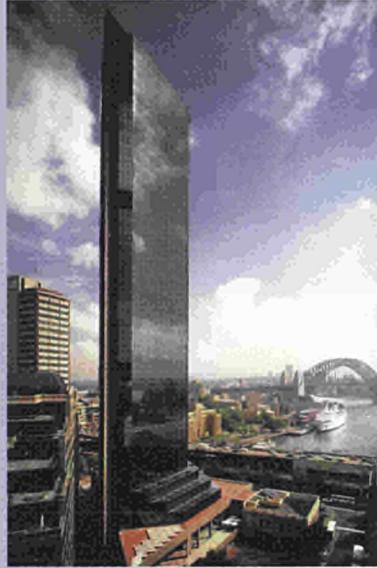
The European Union cooperates actively with industrialised countries on the basis of reciprocal access to respective research efforts. This strategy has led to the implementation of various specific cooperation agreements with other countries, such as Canada, Australia and Israel. Besides ad-hoc joint actions with the United States (for example, the creation of a joint Task Force in the field of biotechnology), talks are underway concerning a general scientific and technological agreement with the US. A similar accord is taking shape with Russia. Another type of cooperation has been developed with Japan and Korea in the form of grants allowing young Europeans to work in university or industrial laboratories in these countries.

The role of scientific and technological cooperation between Europeans is also of prime importance for multilateral relations, and participation in international initiatives demanding coordination between EU Member States. This is the case notably in certain megascience projects such as ITER (thermonuclear fusion) or in ambitious programmes such as Human Science Frontier (study of cerebral and biological functions), IMS (in-

Cooperation down under

The science and technology cooperation agreement with Australia, the first ever signed between the EU and an industrialised country, dates from 1994. After three years of spadework - the time needed for the new partnership opportunities available to the two communities to take shape - the results of this association are

very positive. Australian researchers are now participating in 26 RTD projects launched under the aegis of the Framework Programme in medicine and biotechnology, information and communications technologies, in environment and marine science. Similarly, the participation of European researchers in Australian R&D programmes has been on a rapid rise since the signing of the agreement: they are now to be found in at least 40% of international projects launched in Australia.



telligent manufacturing systems), etc. The EU is also coordinating its participation within various technoscientific exchanges initiated by major world organisations such as WHO (health), OECD (scientific policy), IAEA (atomic energy), etc.

Two areas with a financial advantage: the East and the South

Arguably the two most politically sensitive areas, INCO-COPERNICUS and INCO-DC involve countries in Central and Eastern Europe and developing countries respec-

tively. These two aspects of the INCO programme each receive a five-year budget of ECU 247 million, together totalling some 86% of the overall funds earmarked for international cooperation under the Fourth Framework Programme.

Technological and scientific cooperation with the countries of Central Europe (CEC) and the New Independent States (NIS) of the former Soviet Union - INCO-COPERNICUS

Since the collapse of the Berlin Wall, European Union

relations with the CEC - that "half of Europe" seeking accession - have become of paramount importance. While the accession of ten of these countries is accepted in principle, actual membership depends on their ability to adapt their economic and industrial structures. This objective has now prompted a special effort to redeploy their scientific and technological potential, a key factor in this transformation.

Besides the CEC, this effort also involves the whole of the formerly communist part of Europe. The success of the difficult transition undertaken by the NIS is similarly dependent on their capacity for scientific and technological development. Consequently, the strengthening of cooperation and exchange with these countries is an important aspect of the European Union's external RTD policy (see pages 8 and 9).

Cooperation with developing countries (DC) - INCO-DC.

Among the industrialised countries, Europe - whether in terms of the European Union as a whole or in terms of individual Member States - is one of the key players in development policies implemented throughout the world. The socio-economic problems shared by many countries - especially the poorest - pose more than ever a world-wide challenge, to which scientific and technological responses can and must be found. Since 1982, the European Union has initiated cooperation with the DC based on research partnerships focused mainly on health problems



and the use of renewable natural resources, with particular emphasis on agricultural and agro-foods activities (see pages 10-11).

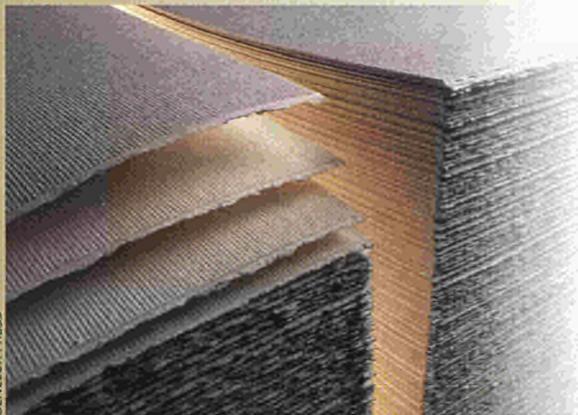
A place for "emerging economies"

In recent years, change has taken many forms in the bloc of countries traditionally referred to as the "Third World" ⁽²⁾. In Asia and Latin America, the rapid expansion of a certain number of so-called *emerging economies* - often perceived as fierce rivals trading on their low labour costs - is founded on spectacular advances in certain technological sectors. These countries, some of them, such as China, India, Brazil, Argentina and Mexico, with a huge potential for economic development, make up a new group with which Europe wishes to develop specific scientific and technological links.

In a communication addressed to the Council of Ministers and the European Parliament in July 1996, the Commission emphasised that the technological take-off of these countries would go hand in hand with a strong demand for equipment and goods, with much to be gained. Far from being excluded from these developing markets, Europe occupies solid ground. It has every chance of consolidating its position, provided it remains alert to specific opportunities for cooperation emerging there.

To meet this objective, the Commission has defined a plan of action based, in particular, on a policy of selective agreements with these countries.

Recycled paper, green paper



Boosting the potential for paper recycling; achieving quality products from clean industrial processes; contributing to a sustainable development policy; limiting the deforestation of central European woodlands... A research partnership for chemistry (the Netherlands/Hungary/Slovenia) has brought benefits to all concerned: paper production without harmful effects in the two central European countries and a new "erasing" technique for residual inks, perfected, on this occasion, by Dutch researchers.

"Besides the studies carried out in our respective laboratories, the project triggered many contacts 'on the ground'," explains professor Arie Hooimeyer (TNO), the project's coordinator. "Hungarian and Slovenian researchers and members came to the Netherlands, and the Dutch made on-site visits. This initiative could not have succeeded without this very close partnership."

TNO (NI)/Paper Research Institute - Fuzfo Paper Mill (H)/Pulp and Paper Institute Ljubljana - Paper Mill Goricanne (SI)

PECO-COPERNICUS Programme

The Euro-Mediterranean partnership

The full flowering of scientific and technological exchange is an important part of the close historical and political ties that link Europe with its neighbours on the perimeters of the Mediterranean. The desire to reinforce this S&T cooperation was explicitly confirmed at the

Barcelona Conference in November 1995, where the fifteen Member States and eleven Mediterranean countries met with a view to a global "Euro-Mediterranean" partnership.

At present, cooperation with Cyprus, Malta, Turkey and Israel (a country with which the EU has recently signed a specific RTD association agreement) affords

these countries direct participation in specific Fourth Framework programmes. All partner countries on the southern Mediterranean coast can, for their part, benefit from support for joint research projects through the INCO-DC programme.

To strengthen the Euro-Mediterranean scientific and technological area, a joint approach is being developed on important common regional problems linked to the study and prevention of marine pollution, the management of coastal areas, the fight against desertification, rural and urban development, etc.

Towards the Fifth Framework Programme

The benefits gained by European science and technology from targeted cooperation with a wide range of partners around the world have been amply confirmed by various external audits conducted recently. The INCO programme plays an essential role in bringing extra added value to European research, while boosting its influence and reputation in the eyes of the world's scientific community.

Thus the Commission's proposal for the Fifth Framework Programme includes a special action for the promotion of "international cooperation". It will be one of the three *horizontal* programmes. In some respects, future international cooperation will be more decentralised within each spe-

(2) It is worth noting in this respect that the EU and South Africa signed a scientific cooperation agreement last December.

cific RTD programme than it is today, with various arrangements available according to the group of countries involved, ranging from full association to simple project participation.

At the same time, the INCO programme will provide new specific functions, such as the management of key cooperation activities with certain countries (for example, the promotion of "centres of excellence" in the CEC) or researcher training (particularly, grants for researchers from developing countries). Above all, INCO will carry out important coordination activities: with other Framework Programme initiatives, other European fora, Member States, and so on.

Poised on the threshold of the new millennium, the EU – just like the changing world around it, with which it is constantly in touch – must develop its international RTD cooperation activities if these are to become still more effective and efficient. ■

An ecological alternative to herbicides

The irrigation infrastructure of southern Argentina's semi-arid zone is faced with a proliferation of aquatic plants that are ruining farmers' lives. However, instead of using traditional chemical and mechanical means to tackle the problem, European and Argentinean researchers have successfully studied and tested a biological method that is far less costly and entirely ecologically sound. They are cultivating species of carp in the irrigation channels. By feeding on the plants and disturbing the aquatic environment, the fish ensure channel maintenance throughout the growing season. The added value: the creation of a new line in fish breeding. "The fact that we have found a solution to a very specific problem – and one that can be used in



many other countries – is not the sole source of satisfaction in this project," asserts project coordinator Dr Hootsman of the Hydraulic and Environment Institute (IHE, NL). "It is the feeling that this active cooperation between European and Argentinean researchers has genuinely helped our partners to help themselves."

Science and Technology for Development Programme

Euro-Mediterranean partnership

How do we protect an enclosed sea like the Mediterranean from the industrial and agricultural wastes of its coastal countries – such as the by-products from tanneries and dye works? And how do we achieve this goal without suffocating the region's indispensable sources of economic activity and employment? In a joint initiative, research centres from Egypt, Cyprus, Greece and the United Kingdom are studying methods of first solidifying and neutralising, then recovering in surface coastal waters, a whole series of toxic substances, using local cement-based materials,



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trass and specifically manufactured absorbents. Rendered chemically inoffensive, these residues can then be buried in land sites.

Partners:

The Imperial College of Science, Technology & Medicine (UK), National Technical University of Athens (GR), University of Alexandria (Egypt), Ministry of Agriculture and Fisheries and Natural Resources, Nicosia (Cyprus).

AVICENNE Programme – S&T Cooperation with the Mediterranean basin

RTD : the necessary path to enlargement



On 15 May 1997, the Research Council agenda was devoted to the preparation of the Fifth Framework Programme. In line with the principle of the "structured dialogue", a special session was held the day before with all the associated Central European Countries (CEC) which are candidates for accession to the EU. RDT info interviewed Minister Aleksander Luczak, Chairman of the State Committee for Scientific Research, Republic of Poland.

Eight years after the fall of the Berlin Wall, how would you characterise the scientific and technological potential of the Central European Countries?

Prof. Aleksander Luczak : Science and technology systems under the communist regimes were bureaucratic, centralised and inefficient. Their level of scientific output was certainly far below that of Western countries. Nevertheless, speaking for my own country, Poland succeeded in maintaining a valuable potential for two main reasons.

First, Poland's science was less isolated from the West than many other communist countries, particularly in the 1970s and 1980s. Scientists managed to preserve a certain freedom in their activities and research attracted many creative young people. It was relatively easy to travel abroad. Many of them undertook training in leading scientific centres throughout the world and, after coming back to their own country, were able to maintain a high international level despite obsolete equipment and inadequate funding. In 1981-

1985, Poland stood in fifteenth place in the world for the number of its scientific publications.

Second, the separation between scientific research and education / teaching was not so great as in other countries. Although the Polish Academy of Sciences

was the state body responsible for research, it never attained monopoly status. More than 70 per cent of people with scientific degrees were employed in higher education, where the participation in both basic and applied research was significant.

How has the situation evolved today ?

After 1989, throughout the CEC, science posed a double dilemma. On the one hand, it was necessary to limit the extent of state intervention. On the other, the authorities had to play a necessary role in rebuilding it. We had also to reduce over-employment in the science sector and to rationalise the use of diminishing financial resources. In 1991, Poland created a new State Committee for Scientific Research (KBN). The main feature of this structure is that it is no longer only a government body. Twelve of its nineteen members are elected in general elections within scientific communities. KBN's institutional form combines governmental interests with those of science. The new R&D policy is built on several principles such as competition in the new financing system, the need for evaluation of institutional and individual scientific performance, and the openness and transparency of the decision-making process and its results.

Structured dialogue:

EU - associated CEC

The expansion of the EU to include the 10 Central European Countries that have applied for membership - and which benefit accordingly from specific association agreements - will bring with it a substantial strengthening of European scientific and technological potential at a world-wide level. The associated CECs have a significant scientific community to their credit, which has in many disciplines proved itself capable of overcoming the handicap of isolation through the originality of its approach. The scientific expertise of these countries is internationally acknowledged in such fields as mathematics, theoretical physics, mechanics, chemistry, material engineering, optics, and biology.

Despite efforts to modernise research procedures and higher education - supported by such programmes as COPERNICUS and Phare - the process of restructuring RTD in these countries has proved slower and more difficult than expected. As they confront the many problems experienced by economies in transition, a shortage of financial resources makes it difficult to give the sector the priority attention it deserves. EU backing must enable these countries to accelerate and attain full scientific and technological development.

Since 1995, the council of European research ministers has staged periodic meetings for structured dialogue, during which they have examined new guidelines, designed to generate dynamic scientific and technological cooperation with their colleagues from associated CECs. In this context, the Fifth Framework Programme proposal as adopted by the European Commission provides for the full association with the Framework Programme of those CECs that are candidates for membership of the European Union.

What are the current priorities?

First of all, in the CEC, we need to overcome the technology gap in the economy, in order to become competitive and to initiate, promote and support innovation-oriented policy. The current priority areas are high technology industry, health and environmental protection, agriculture and food processing. We need also to develop infrastructure, above all computer networks, and to accelerate the development of human resources for education, economy and science itself.

Poland was involved from the very beginning in the R&D cooperation projects initiated by the EU. How do you assess the results of that participation?

Just to give you some recent figures, some 121 Polish scientific institutions or enterprises were selected for funding in 1996, of which 30% were involved in projects related to information and communication technologies and a further 20% in industrial and material technologies. During 1995-1996, there were also 56 Polish participants on a "project-by-project" basis in the other EU-RTD specific programmes, mainly in the biomedical and environment areas. We are quite happy about this Polish involvement, except that the success rate of proposals is relatively low - the figures given above result from more than 800 submissions. The processing times and procedures for project selection are also long and complicated.

What are the main expectations of the CEC for the future of their R&D cooperation with the EU?

I believe that complete participation in the EU's Fifth Framework Programme is essential to the success of the CEC's integration into the EU. It could, however, be very difficult for Poland to pay the full price of this participation, which is based on the country's GDP. According to rough calculations, for Poland it will represent ECU 200 million, i.e. 8 to 10% of the national RTD budget in 1999-2002. Keeping in mind that many entities conduct research at an international level in fields which are not encompassed by the Framework Programme, this would adversely affect the functioning of our RTD. We would therefore like to negotiate an association agreement which would allow us a more progressive financial participation for the first few years.

In my opinion, in order to meet some particular needs of individual countries, the Fifth Framework Programme should also continue to have a specific programme like Copernicus. I also expect the countries associated with the Fifth Framework Programme to be represented in different decision-making bodies, in particular in the management committees of the specific programmes. ■

Reinforcing pan-European river transport



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Since 1992, the canal linking the Main to the Danube has made it possible to navigate from the North Sea to the Black Sea. To promote the considerable economic potential of this new pan-European "highway" - a particularly sound initiative ecologically speaking - the development of a unified satellite communications infrastructure is underway. Christened COMSINE, it will provide optimal real-time management of ship and freight traffic. Trials of the COMSINE system have involved river transport firms from Hungary, the Slovak Republic and Romania, all interested in the concrete spin-offs of these advanced communications technologies.

Partners:

Maritime Systems Technology BV (NI), Mahart Sea Trade (H), Incertrans Transport Research Institute (R), Research Institute for Transport-VUD (SK), Inmarsat (UK), Vega Group (UK)

COPERNICUS Action

Explosives for peace

The redeployment of military RTD in the NIS to civilian activities involves, among other things, the recycling of a million tons of TNT, the mere storage of which poses grave threats to the environment. A 3-year study (involving disciplines ranging from basic chemistry to material synthesis) must find a way of transforming this trinitrotoluene so that it can be incorporated into materials



useful for advanced technologies (polymers used in microelectronics and aeronautics) or the development of new - especially biotechnological - products (fertilisers etc.).

Partners:

CIST (Moscow)-Fraunhofer Institut für Chemische Technologie of Pfinztal (D.) -

Lawrence Livermore National Laboratory (USA).

CIST

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Creating a new European strategy for cooperation with developing countries

Scientific and technological cooperation with developing countries was long seen as a "transfer of science". Today, a new approach, focusing on "aid to science" and based on research partnerships for sustainable development, is taking its place. The direction taken by the Commission in its new European strategy for RTD cooperation with developing countries (DC) is based on this model.

In a world where "knowledge and information societies" are increasingly taking the lead, the continued backwardness of research in most DC - especially the poorest - must be viewed as a worrying handicap. Particularly when we know that RTD will be an ever more decisive factor in their economic, social and cultural development.

That is why a global policy is needed to draw in players in the countries concerned. Moreover, investment in research - through development aid programmes as well as local political and economic authorities - has thus far proved grossly inadequate for want of a long-term view. These are the findings providing the basis for the Commission's communication to the Council of Ministers and the European Parliament last April, proposing a new science and technology cooperation strategy with the DC.

Boosting scientific and technological capacity

These guidelines hinge on the need to emphasise a strengthening of scientific and technological capacity

in every aspect of EU - DC cooperation. "We must reaffirm our goal of achieving a significant increase in Community aid to this sector between now and the year 2000," the Commission doc-

ument stresses. This means more consistency between the various strands of development policy, and, in parallel, the opening of a constructive dialogue with the DC to translate increased funding into actions. In addition to the necessary collaboration of the public authorities in these countries, we must ensure the involvement of the civilian and private sectors in project implementation.

DC research cooperation priorities in the Fifth Framework Programme must be sufficiently diversified and flexible to take account of the specific needs of each country or region. Along with those sectors already targeted - natural resource management, agriculture and agro-industries, health, and information and communications technologies - new research partnerships could be launched on such themes as socio-economic research, energy, and other technological areas of mutual interest. Support for university research structures and training must also play an important part in this scientific cooperation policy.

Preventing the recurrence of malaria

Malaria kills between 1.5 and 2.7 million people every year, a fifth of whom are children. Between 300 and 500 million people suffer from the disease. Nine out of ten cases are in sub-Saharan Africa. The disease is making a comeback in regions where it was thought to have been eradicated. The solution? A vaccine. The research? It will require a close North-South partnership between experts able to identify feasibility criteria, obstacles to development, appropriate clinical trial procedures, etc. Since 1995, Europe has launched three concerted ac-

tions in the fight against malaria, focusing on research for a new vaccine. The European Union is in fact one of the founders of the African Malaria Initiative, devoted to

monitoring the effectiveness of hygiene and therapeutic measures on the African continent.

Partners:

Action Concertée pour le

Développement d'un Vaccin contre la Malaria (VINCO-MAL) - Primate Vaccine Evaluation Network (PVEN) - African Malarial Vaccine Testing Network (AMVTN).

INCO-DC



PHOTO NEWS

Promoting a North-South partnership for sustainable development

In addition to the Commission communication cited above, the Dutch government - holding the presidency of the European Union for the first six months of this year - and the European Commission sought to develop widespread thinking on the meaning of the EU-DC research partnership for *sustainable development*, by staging a major conference on the subject in March 1997, in Leiden (the Netherlands). Those taking part in this debate stressed the dual connotation of the *sustainable development* concept. Firstly, *development* must be part of an overall approach to the major challenges facing the world - the fight against poverty, adequate food supply, the promotion of health, and the protection of the environment. Secondly, if the responses to these problems are to be genuinely *sustainable*, the DC involved must be the prime players and assert their ability to take their destiny and future in hand.

In this respect, the notion of a research partnership for development must break with the often unbalanced traditional approach; offers of scientific and technological expertise from the North undoubtedly still rely too little on a structured description by the South of its requirements and on adequate training for its researchers.

The Leiden Forum therefore recommended more effective use of social science research partnerships, neces-

A cure for the sweet potato



Typhoon-resistant and highly nutritious, the sweet potato is an essential food in the Far East, Africa and Latin America. China accounts for 90% of its production. In the last few years, 80% of crops harvested were damaged by various viruses. A close Chinese, Indonesian and European partnership has made it possible to eliminate these viruses in certain plants, and prevent the possible reinfection of these healthy plants using biotechnological methods. The result: a rise in production of up to 135% in certain regions of China. Says project coordinator Philippe Lepoivre of the Facultés des Sciences Agronomiques de Gembloux (Belgium), "Among other things, these results raise the prospect of eradicating viruses in other important tropical plants, such as the banana and the yam."

Partners:

Faculté des Sciences Agronomiques de Gembloux (B), University of Bath (UK), Université de Paris-Sud (F), Guangdong Academy of Agricultural Science (China), Southeast Asian Regional Center for Tropical Biology, Bogor (Indonesia).

Science and technology for development programme

sary for identifying the basic mechanisms of change in the DC. Priority must also be given to reinforcing the structures for higher education and research structures.

The importance of the INCO-DC programme - to be strengthened in the Fifth Framework Programme - was greatly stressed by those present. It was found, moreover, that the effectiveness of EU partnerships with the DC could only grow if closer synergies were established between the INCO-DC policy and other important Community instruments re-

sponsible for financing development cooperation policy - such as the EDF (European Development Fund), which finances EU-ACP initiatives under the Lomé Convention.

Meeting the agronomic challenge

1995 saw the launch of the European initiative on agricultural research for development (EIARD). The 15 Member States - along with Norway and Switzerland - and the European Commission combined efforts to

combat starvation, which affects almost one billion of the world's population. The challenge of boosting available food stocks - given the estimated 8 billion mouths that will have to be fed in 2025, compared with the current 5.8 billion - calls for a mobilisation of agronomic research resources. EIARD concentrates today on coordinating the efforts of Europe's leading-edge agronomic research units in order to maximise the impact of investment in this field.

Europe has thus been a presence in the growing public awareness of this emergency, denounced last November in Rome at the World Food Summit organised by the FAO, when more than 200 countries signed a Declaration on World Food Security, designed to coordinate a global effort to eradicate the problem of hunger.

Boosting nutrition without neglecting dietary habits

Sorghum is a drought-resistant staple food for rural populations in arid areas, but it lacks lysine and threonine - two essential amino acids. Thanks to a dual approach (a classical selection procedure and molecular biology), European and African teams have succeeded in creating new, artificially mutated strains of sorghum with excellent nutritional qualities, which are currently growing in the experimental fields of Burkina Faso's Institut National de Recherche Agronomique. The fact that



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sociological considerations (West African dietary and culinary customs) were brought to bear on the choice of the sorghum variety used, has undoubtedly contributed to the project's success.

Partners:

Vrije Universiteit Brussel (B) - Universität Hamburg (Al.) - C I R A D - C A Montpellier (F) - I E R - D R A - SRCVO, Bamako

(Mali) - SOMIMA INERA (Burkina Faso) - Institut Polytechnique Rural de Katibougou, Koulikoro (Mali)

Science and technology for development programme

Contacts for the INCO programme

Other fora for European scientific & technical cooperation

Nicholas Newman

Fax : +32-2-296.59.76

E-mail : sylvie.jourquin@dg12.cec.be

Countries of Central Europe and the New Independent States

Rudolf Meijer,

Fax : +32-2-296.33.08

E-mail : inco-copernicus@dg12.cec.be

Non-European industrialised countries

Louis Bellemin

Fax : +32-2-296.98.24

louis.bellemin@dg12.cec.be

Developing countries

Timothy Hall,

Fax : +32-2-296.62.52

E-mail : timothy.hall@dg12.cec.be

General information

Charles-Henri Metzger,

Fx. +32-2-296.60.20

E-mail : charles-henri.metzger@dg12.cec.be

Internet sites

INCO Home Page:

• on the Europa server: <http://europa.eu.int/en/comm/dg12/intco1.html>

• on the Cordis server: <http://www.cordis.lu/inco/home.html>

EUREKA Home Page: <http://www.eureka.be>

Information in brief

I. EU cooperation with the countries of Central Europe (CEC) and the New Independent States of the former Soviet Union (NIS)

Partner countries

■ 10 associated CEC (who have requested and obtained the possibility of accession to the European Union): Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, the Czech Republic, Romania, the Slovak Republic, Slovenia and;

■ 3 non-associated CEC: Albania, Bosnia-Herzegovina, former Yugoslav republic of

Macedonia

■ 7 European NIS: Armenia, Azerbaïdjan, Belarus, Georgia, Moldavia, Russia, Ukraine;

■ 5 extra-European NIS: Kazakhstan, Kirghizia, Uzbekistan, Tadzhikistan, Turkmenistan.

Forms of cooperation

1. INCO-COPERNICUS

Taking over from the PECO-COPERNICUS initiative (1992-

1994), INCO-COPERNICUS is the strand set up for the benefit of the CEC/NIS within the Fourth Framework Programme's specific **International Cooperation** programme. With a budget of ECU 130 million, this strand covers EU/CEC-NIS partnership funding for joint research projects or concerted actions in the following areas: environmental protection, health, non-nuclear energy (including

demonstration projects), information and communications technologies, industrial and materials technologies, food technology, and social sciences.

A call for proposals was launched on 15 April, 1997, with the closing date of 26 September, 1997.

2. Participation in specific RTD programmes

The Fourth Framework Pro-

gramme provides for the inclusion of participants from the CEC and European NIS in partnership projects submitted in answer to calls for proposals launched by **all specific research programmes**. For the non-European NIS, this is subject to certain restrictions. However, "project by project" participation can, if necessary, be backed financially by the INCO programme budget.

3. COST (European cooperation in the field of scientific and technical research).

Seven CEC (Estonia, Hungary, Poland, Czech Republic, Romania, Slovak Republic, Slovenia), together with Croatia, are COST members. As such, they can participate in all RTD coordinated and concerted actions launched in a great number of areas.

4. Eureka

Five CEC (Hungary, Poland, Czech Republic, Romania, Slovenia) and Russia are members of Eureka. As such, they can take part in projects under this label and so receive the appropriate support.

5. INTAS (International association for the promotion of cooperation with scientists from the NIS)

Launched in 1983 in answer to the financial difficulties faced by many NIS scientists and in order to allow them to pursue their work, this initiative is jointly financed by the EU and its Member States, Norway, Switzerland, and Israel. By mid-1996, some 1,000 research projects conducted in synergy by EU and NIS researchers - covering natural and exact sciences as well as social sci-

ences - had received INTAS support amounting to ECU 46 million.

6. ISTC (International science and technology centre)

This body, the result of an agreement signed in 1994 between the EU, the US, Japan, and the Russian Federation, is endeavouring to help military researchers from the former Soviet Union switch to civil activities. The Tacis programme supplies Community financing and DG XII provides assessment and follow-up of joint projects in such fields as energy, environment, aeronautics, space research, biotechnology, etc. More than 400 projects, involving nearly 20,000 NIS scientists and engineers, have received support over the last three years.

7. Chernobyl programme

An agreement, with a budget of ECU 35 million, was concluded in 1992 between the EU and 3 European NIS (Ukraine, Belarus and Russia). Research backed by the Chernobyl programme is directed at the study of contaminated sites and decontamination strategies, an understanding of the mechanisms that transfer radioactive contamination to man and the environment, the effects on health and possible treatments, as well as decision-making aids for on-site use in the event of an emergency.

INCO-DC programme

Priority objectives

- Enable DC to participate in the development of innovative expertise and technologies suited to their development problems
- Help boost the high-quality RTD capacity and human resources necessary for sustainable development in DC
- Maintain in Europe a high level of expertise in scientific fields that contribute to development.

Areas

Open to partners from developing countries, EU-DC research projects financed by INCO-DC are focused in three priority areas with specific RTD aspects being handled through dialogue between the DC concerned and the European Commission:

- improvement of public health;
- improvement of agricultural and agro-industrial production;
- sustainable management of renewable natural resources (forests, oceans, water, energy, etc.).

As a result of this dialogue, some projects may

touch on still other fields (especially information and communications technologies, and industrial or materials technologies).

Project selection also considers research themes from a regional perspective.

Itemised report

Between 1982 and 1994, ECU 252 million were allocated to Community RTD programmes in DC. Some 1,050 research projects involving EU-DC partnerships were launched during this period.

A similar sum (ECU 247 million) was allocated under the Fourth Framework Programme. The first two calls

for proposals, launched in 1995, were allocated about ECU 65 million of the budget and selected 144 projects, 34 dealing with natural resources, 35 with agriculture, 57 with health, and 18 with information and communications technologies. These ventures involved more than 850 EU and DC participants. A third call, launched on 15 April, will close on 11 September, 1997.

News in Brief

European RTD Policy

Mad Cow Disease: second call for proposals - In the framework of a research action plan for the various forms of transmissible spongiform encephalopathy (TSE), a second call for proposals was launched by the Biomedicine and Health programme, the Biotechnology programme and the FAIR programme. Closed on 15/7/97, the call will finance a new set of European projects to further our understanding of the disease and find ways of combating it. The implementation of this action plan still depends on the approval by the Council and the European Parliament of the financial supplement to the Fourth Framework Programme (PR : 6/5/97).

Publications

■ *First Action Plan for Innovation in Europe* - ISBN 92-827-9292 - Available in the 11 Community languages.

After a vast Europe-wide consultation process launched following the publication of the Green Paper on Innovation, the European Commission proposes to Member States, and to all concerned, priority lines of action based on three principles: the promotion on all levels - education, business, administration - of a genuine culture of innovation; the development of a legal, regulatory and financial framework that fosters its development; improved interaction between research and innovation.

Contact : Robin Miège, DG XIII
Fax : +352-4301.3338

■ *Reports on the Strengths and Weaknesses of European Science* - This study, coordinated by EUROHORCs and ESTA, presents a thorough diagnosis of European science in nine major fields: environmental sciences, physics, economic and social sciences, human biology, biochemistry and molecular biology, human sciences, chemistry, geology and earth science, and mathematics. The aim: to initiate reflection and debate on these matters within the scientific community.

Programme addresses on EUROPA

The EUROPA World Wide Web addresses given for the various programmes referred to in the following two pages should all be prefixed with the address of the DG XII site:
<http://europa.eu.int/en/comm/dg12/>

Access to DG XII press releases

Information ending with the reference (PR + date) is also available in the form of press releases at:

<http://europa.eu.int/en/comm/dg12/press.html>.

Press releases may also be obtained from the Communication Unit: Fax : +32-2-295.82.20.

Publications

All publications listed where the title is followed by an asterisk * are subject to charges. They may be ordered from the Office for Official Publications of the European Communities - Fax : +352-48.85.73. Other publications may be obtained from the programmes concerned.

Contact : EPSRC
Fax : +44-1793-444.505
E-mail : eurohorcs@epsr.ac.uk

■ *The Future of the European Aerospace Industry - Summary of Proceedings* - A summary of the seminar organised by the European Commission and Parliament on 5/11/96 - Published by the European association of aerospace industries (AECMA) - Fax : +32-2-775.81.11

Information Technologies

Fax : +32-2-296.83.88
E-mail : esprit@dg13.cec.be
WWW : <http://www.cordis.lu/esprit/>
For your diary - *ESPRIT Information Days* - 29/9/97 - Brussels (B) - Information sessions on the technical subjects covered by the call for proposals launched on 16/9/97. Opportunities for personal contact with Esprit programme staff. SMEs are particularly welcome and the day is open to representatives of the CEC and NIS as well as those of Mediterranean countries.

Industrial and materials technologies

Fax : +32-2-295.80.46/296.70.23
E-mail : imt-helpdesk@dg12.cec.be
EUROPA : br-eur1.html

For your diary : *Conference on Industrial Technologies* - 27-30/10/97 - Toulouse (F) - Centred on "research at the service of the citizen", this event will focus on three themes in RTD applications and perspectives: the living and working environment, the factory of the future, and new perspectives in the aerospace and aeronautics industries. The first of these subjects deals with Europeans' daily aspirations (air quality, recycling of waste, "intelligent" transport, etc.); the second concerns the 120 million people working in various sectors where the methods of production, the quality of procedures and services, increasing competitiveness in the jobs market and the organisation of work are of concern; the third deals with one of Europe's vital sectors (1 million jobs, 7 000 companies). Technical sessions

together with an exhibition will present the results of RTD projects supported by various Community programmes.

Standards, Measurements & Testing

Fax : +32-2-295.80.72
E-mail : pierre.meriguet@dg12.cec.be

Results of the call for proposals closed in November 1996 - 59 research projects were selected for a total budget of ECU 33 million (PR : 29/4/97)

Environment & Climate

Fax : +32-2-299.57.55
E-mail : environ-infodesk@dg12.cec.be
EUROPA : envir1.html

For your diary - *Fourth European Workshop on Stratospheric Ozone* - 22-24/9/97 - Schliersee (D)
Contact DG XII : G. Amanatidis.

Publications - *Proceedings of the European Workshop on the Impact of Endocrine Disruptors on Human Health and Wildlife* - Fish and alligators are changing sex, breast cancer is on the increase, the male sperm count is in decline. Can certain new chemical substances be a common factor in the endocrinological disturbances affecting various regions throughout the world? This report summarises the scientific debate organised last December at the initiative of the European Commission (DG XII), the European Agency for the Environment, and the European Centre for Health and the Environment (World Health Organisation).

Contact DG XII : C. Nolan
■ *Protection and Conservation of the European Cultural Heritage* - Research Reports no 5 : Effects of Salts on the Degradation of Monuments in Marine and Continental Environments - Research Reports no 6 : Degradation and Conservation of Granitic Rocks in Monuments
Contact DG XII : J. Acevedo
■ *European Stratosphere Ozone Research - Air Pollution Report no 16*
Contact DG XII : G. Amanatidis

European Workshop on Environmental Technologies 1996 - Documentation

Contact DG XII : J-H. Büsing

■ Recycling technologies, Treatment of waste and contaminated sites - Research report no 15

Contact DG XII : J-H. Büsing.

Marine Science and technologies

Fax : +32-2-296.30.24

E-mail : mast-info@dg12.cec.be

EUROPA : marine1.html

Ocean protection and management : 56 new projects adopted

- Following a call closing on 15/10/96, these projects, covering research on the health of the world's oceans and conditions for their sustained management, as well as marine technology development, will benefit from a global financial package of ECU 76 million (PR : 26/6/97).

For your diary

■ *Symposium on Ocean Data for Scientists* - 15-18/10/97 - Dublin (IRL)

■ *Progress in the Oceanography of the Mediterranean Sea* - 17-19/11/97 - Rome (I) - Conference presenting the pilot phase of the Mediterranean Targeted Project (MTP 1 - 1993/96).

Biotechnology

Fax : +32-2-299.18.60

E-mail : life-biotech@dg12.cec.be

EUROPA : biot1.html

European Plant Biotechnology week - Staged in ten countries (last 7 to 12/ 7/97), by AMICA (Advanced Molecular Initiative in Community Agriculture), *European Plant Biotechnology week* was aimed at showing the wider public the prospects of developing sustainable and diversified applications from the plant kingdom. The event provided an opportunity to present the *Project of Technological Priority (PTP)*, set up more than three years ago with the participation of 130 EU laboratories, and with backing - to the tune of some ECU 24 million - from the Biotechnology pro-

gramme. The PTP examines the prospects for new varieties that meet the sustainable needs of both agriculture and the environment - plants that combine high-yield, high nutritional value, resistance to salinity and drought, with cost-effective fertiliser requirements - and is striving to develop biotechnological procedures based on genetic tagging (as opposed to modification).

Fax : +44-1256-46.93.08

E-mail : amica@defacto.co.uk

Publications

■ *Nature - The Yeast Genome Directory* - This supplement, published by the journal *Nature* (29/5/97), comes with a CD-ROM containing the entire DNA sequence of yeast, the result of research launched by the Commission's Biotechnology Unit and funded since 1989.

■ *National Files on Biotechnology R&D* - A survey of the biotechnological research carried out in 16 European countries (R&D programmes, industrial activities, investment, human resources, associations, publications, etc).

For your diary - *European Congress on Biotechnology: "Biotechnology at the dawn of the 3rd millennium"* - Budapest (H), 17-21/8/97.

Biomedicine and Health

Fax : +32-2-295.53.65

E-mail : alain.vanvossel@dg12.cec.be

EUROPA : biomed1.html

For your diary : *1st European Conference on the Economics of Cancer* - Organisation : EORTC - 19-21/11/97 - Brussels (B) - Contact : EORTC - J. Bussels - Fax : 32-2-772.67.01 E-mail : jbu@eortc.be WWW : <http://www.eortc.be/>

Non-nuclear energy (Joule)

Fax : +32-2-295.06.56

EUROPA : joule1.html

Results of the September 1996 call for proposals - 107 projects

selected in the programme's four areas will be covered by a global funding package of around ECU 97 million.

Erratum - A technical error occurred in the brief devoted to this item on page 15 of our last issue. It should have read: "83 new demonstration projects funded".

Publications

■ *European Guidelines on Quality Criteria for Diagnostic Radiography Images* - EUR 16260

■ *European Guidelines on Quality Criteria for Diagnostic Radiography Images in Paediatrics* - EUR 16261

■ *European Protocol on Dosimetry in Mammography* - EUR 16263 - *Quality Criteria for Computed Tomography* - EUR 16262

■ Four manuals intended to optimise patient and medical staff protection when radiographic diagnostic equipment is being used. *Synthesis of key findings and recommendations from assessment of completed projects (Joule II)* * - EUR 17650 - ISBN 92-828-07552-5

Nuclear fission safety

Fax : +32-2-296.62.56

EUROPA : fission1.html

For your diary : *Actinides '97*, Baden-Baden (D), 21-26/9/97 - J.Fuger - ITU

Fax : +49-7247-951.354

Nuclear fusion

Fax : +32-2- 296.42.52

EUROPA : fusion1.html

Development of the "Stellarator" process - At the initiative of the Max Planck institute of plasma physics in Garching, the first stone of the new buildings that are to house the world's biggest Stellarator-type fusion research installation - Wendelstein 7-X - was laid on 19/6/97 at Greifswald (Germany). Compared to the "Tokamak" device (tested in JET), the study of the extrapolation possibilities of this type of magnetic containment for the development of a thermonuclear

reactor offers the advantage of not requiring the generation of an electric current in the plasma - thus making continuous operation possible. The machine's construction budget was estimated at around DM 320 million in 1994, 45% of which is to be Community financed.

International Cooperation

Fax : 32-2-296.60.20

E-mail : inco-desk@dg12.cec.be

EUROPA : intco1.html

Call results - *INTAS call of 15/12/96 (closed 2/4/97)* - 332 new projects were approved, bringing the number of INTAS backed projects since 1993 to 1,526. The results of completed projects can be found on Cordis. (<http://www.cordis.lu/intas/home.html>). The next call will be open for six months as of autumn 1997.

Publication - *COST : Science for the Millennium* * - A new panorama of all COST Actions - EUR 17607 - ISBN -92-828-0250-7

Training and mobility of researchers

Fax : +32-2-296.32.70

E-mail : tmr-info@dg12.cec.be

EUROPA : tmr1.html

<http://www.cordis.lu/tmr/home.html>

Call for contributions - *Marie Curie Fellowships* - The Commission would like to issue brochures highlighting Marie Curie research work. Grant-holders and host bodies are invited to contribute to this project. Contact: Melanie Kitchener, DG XII Fax : +32-2-296.21.33 - E-mail : melanie.kitchener@dg12.cec.be

For your diary

■ *9th European Contest for young scientists* - 10-13/9/97 - Milan (I)

■ *"Youth" Symposium* - 7-8/10/97 - Brussels (B) - European Commissioner Edith Cresson meets 100 young people who have taken part in Community programmes for education and research.

Ongoing/Upcoming calls for proposals

(from September 1997)

Programme (and main contacts)	Publication	Deadlines	Areas (and specific contacts)
INFORMATION TECHNOLOGIES (ESPRIT) Contact: Gerda Colling Fax: +32-2-296.83.88 E-mail: esprit@dg13.cec.be	15.3.97	16.9.97	Open call in various tasks of all domains.
	15.4.97	31.3.98	Open call: Intelligent Manufacturing Systems (jointly with the BRITE-EURAM programme). CONTACT: IMS Secret. - Fax: +32-2-299.45.72
	17.6.97	16.9.97	Software technologies (ESSI, trial applications)
	16.9.97	16.12.97(*) 16.10.97(**)	(*) Single-step evaluation scheme: software technologies; multimedia systems; long-term research; open microprocessors systems initiative; integration in manufacturing (**) Two-step evaluation scheme: technologies for components & sub-systems; multimedia systems; long term research; high performance computing & networking.
ADVANCED COMMUNICATION TECHNOLOGIES AND SERVICES (ACTS) Contact: Fax: +32 2 295 0654 Email: aco@postman.dg13.cec.be	17.6.97	26.9.97	3rd call: all domains (interactive digital multimedia services interoperability; new concepts and novel devices for routing/switching in optical networks; convergence and integration ATM-Internet; software radio technologies; advanced technologies and systems for satellite communications; concerted action on satellite communications; open communications environment, using "agent technologies"; secure information exchanges over broadband communications.
	17.12.96	15.9.97	3rd call: industrial research in production technologies (area 1) and materials & technologies for product innovation (area 2).
INDUSTRIAL & MATERIALS TECHNOLOGIES Contact: Fax: +32-2-295.80.46 / 296.70.23 E-mail: imt-helpdesk@dg12.cec.be	15.4.97	31.3.98	Open call: Intelligent Manufacturing Systems (jointly with the ESPRIT programme). CONTACT: IMS Secretariat - Fax: +32-2-299.45.72
	15.12.95	17.12.97	Open call for thematic network projects (areas 1, 2, 3).
	15.12.95	20.5.98	Open call for support & accompanying measures.
	15.6.95	30.7.98	Open call for accompanying measures.
STANDARDS, MEASUREMENTS & TESTING Contact: Pierre Mériguet Fax: +32-2-295.80.72	17.6.97	27.11.97	Dedicated call (CEN, ETSI, CENELEC) in support of Community policies.
	17.6.97	27.11.97	Call for research linked to written standards & technical support for commerce; measurements in the service of society.
	15.12.94	17.12.97	Open call for thematic networks projects.
ENVIRONMENT & CLIMATE Fax: +32.2.296.05.88 E-mail: environ-infodesk@dg12.cec.be	17.6.97	10.10.97	- Centre for Earth Observation (CEO): shared cost actions and concerted actions. CONTACT: Martin Sharman - R&D work for potential future operational activities. CONTACT: Pekka Jarvilehto
	15.3.96	12.6.98 (open)	Preparatory accompanying & support measures. Areas: standards for training & work; modelling; ocean data management & quality control for research & operational applications; use of heavy experimental equipment; research vessels & their modular equipment, large computing facilities & other technical resources in the European Economic Area; design of components & systems for heavy advanced equipment; calibration techniques & standards for marine instrumentation & observational equipment.
MARINE SCIENCE & TECHNOLOGIES Contact: - R&D: Martin Bohle-Carbonell - Training: Elisabeth Lipiatou Fax: +32-2-296.30.24 E-mail: mast-info@dg12.cec.be	17.6.97	10.10.97	RDT actions in the following areas: mechanisms of the circulation and exchange of water masses; coastal processes and morphodynamics; methods for monitoring, forecasting & management of shelf seas & coastal zones; coastal engineering and natural defences (remote sensing); unmanned platforms and autonomous systems; oceanographic measurement and sampling equipment. Support initiatives: modelling, ocean data management & quality control for research and operational applications.

Programme (and main contacts)	Publication	Deadlines	Areas (and specific contacts)
BIOTECHNOLOGY E-mail: life-biotech@dg12.cec.be Contacts: R&D: Alfredo Aguilar - Fax: +32-2-299.18.60 Demonstration: Fax: +32-2-295.53.65 ELSA: José Elizalde - Fax: +32-2-296.05.40	17.6.97	15.10.97	Calls in the following areas: cell factories; genome sequencing; animal mapping and selection; animal models; cell communications in neurosciences; transdisease vaccinology; structure/function relationships; bio-safety; biodiversity; infrastructures; horizontal activities. Demonstration projects in all areas.
	17.12.96	15.9.97 15.3.98 15.9.98	Advanced practical workshops CONTACT: <i>Andreas Klepsch</i> - Fax: +32-2-299.18.60
AGRICULTURE & FISHERIES (FAIR) Contact: E-mail: life-fair@dg12.cec.be	15.9.97 (expected)	16.01.98	- Targeted call in area 3: generic science & advanced technologies for nutritious food CONTACT: <i>Alessandra Luchetti</i> - Fax: +32-2-296.43.22 - Area 4: Agriculture, forestry & rural development CONTACT: <i>Arnaud Borchard</i> - Fax: 32-2-296.30.29 - Area 5: Fisheries and aquaculture CONTACT: <i>Willem Brugge</i> - Fax: +32-2-295.78.62
NON-NUCLEAR ENERGY (JOULE component) R&D Projects Contact: Michel Poireau - Fax: +32-2-295.06.56	15.12.94	17.12.97	Open call: preparatory, accompanying & support measures. CONTACT: <i>Priscila Fernandez-Canadas & Massimiliano Dragoni</i> - Fax: +32-2-295.69.95
NON-NUCLEAR ENERGY (THERMIE component) demonstration projects Contact: Wiepke Folkertsma Fax: +32-2-295.05.77	15.12.94	17.12.97	Call in the following areas: energy RTD strategy (rational use of energy, renewable energies, fossil fuels); dissemination of energy technologies (international cooperation, information & communication tools); preparatory, accompanying & support measures (financial instruments, environmental impact of energy technologies); technology stimulation measures for SMEs; exploratory phase of demonstration projects demonstrative projects for SMEs.
	15.9.97	To be confirmed	Call for targeted type A demonstration projects (rational use of energy, renewable energies, fossil fuels).
NUCLEAR FISSION SAFETY Contact: Rainer Simon Fax: +32-2-295.49.91	17.1.95	1.11.97	Concerted actions.
TARGETED SOCIO-ECONOMIC RESEARCH Contact: Stephen Parker Fax: +32-2-296.21.37 E-mail: tser-secr@dg12.cec.be	16.9.97	15.1.98	Science & technology policy options; research into education & training; research into social integration & exclusion (only in certain areas).
INTERNATIONAL COOPERATION Contact: (see column 4) E-mail: inco-desk@dg12.cec.be	15.2.95	1.3.98	Grants (Japan, Korea). CONTACT: <i>Louis Bellemain</i> - Fax: +32-2-296.98.24
	15.4.97	11.9.97	Science & technology cooperation with developing countries. CONTACT: <i>Timothy Hall</i> - Fax: +32-2-296.62.52
	15.4.97	10.10.97	Inco-Copernicus (Central and Eastern Europe). CONTACT: <i>Rudolf Meijer</i> - Fax: +32-2-296.33.08 - E-mail: <i>Inco-copernicus@dg12.cec.be</i>
DISSEMINATION & EXPLOITATION OF RESULTS Contact: (see column 4)	15.9.97	15.12.97	European networks & services. CONTACT: <i>Javier Hernandez-Ros</i> - Fax: +352-4301-32779
	15.9.97	15.12.97	Regional actions. CONTACT: <i>Mario Bellardinelli</i> - Fax: +352-4301-32084
	15.6.97	6.10.97	3rd call on technology validation and technology transfer projects. CONTACT: <i>Jean-Noël Durvy</i> - Fax: +352-4301-34129
	15.9.97	15.12.97	Increasing public awareness (transfer of best practices). CONTACT: <i>Mario Bellardinelli</i> - Fax: +352-4301-32084
TRAINING & MOBILITY OF RESEARCHERS Contact: Jürgen Rosenbaum Fax: +32-2-296.21.33 E-mail: tmr-info@dg12.cec.be http://www.cordis.lu/tmr/home.html	16.9.97	15.12.97	Marie Curie Research Training Grants (post-graduate, post doctoral & return grants) - See also 2nd table below.
	16.6.97 15.12.97	30.9.97 31.3.98	Euroconferences, summer schools & practical training courses.
MEASURES FOR SMES Contact: Giorgio Clarotti Fax: +32-2-295.71.10 E-mail: marc.van-achter@dg12.cec.be	15.12.94	8.4.98	Technology stimulation measures for SMEs - Cooperative Research in the following programmes (see also next table): Industrial & material technology; standards, measurements & testing; environment & climate; marine sciences & technology; biomedicine & health; agriculture & fisheries; non-nuclear energy.

Technology stimulation measures for SMEs:

(Cooperative research)

Programme (and main contacts)	Publication	Deadlines	Areas (and specific contacts)
INDUSTRIAL & MATERIALS TECHNOLOGIES	15.12.94	8.4.98	CONTACT: Klaus Kögler - Fax: +32-2-299.46.35
STANDARDS, MEASUREMENTS & TESTING	15.12.94	8.4.98	CONTACT: Enma Calvet - Fax: +32-2-295.80.72
ENVIRONMENT & CLIMATE	17.1.95	1.4.98	CONTACT: Jitka Vennekens - Fax: +32-2-296.30.24
MARINE SCIENCE & TECHNOLOGIES	15.12.94	8.4.98	CONTACT: Christos Fragakis - Fax: +32-2-296.30.24
BIOMEDICINE & HEALTH	17.1.95	8.4.98	CONTACT: Viviane Thevenin - Fax: +32-2-295.53.65
AGRICULTURE & FISHERIES	15.12.94	8.4.98	CONTACT (*) : Areas 1,2,3: Xabier Goenaga - Fax: +32-2-296.43.22 Areas 4: Armin Muenzinger - Fax: +32-2-296.30.29 Areas 5: Mario Lopes - Fax: +32-2-295.51.37
NON-NUCLEAR ENERGY (JOULE component) R&D Projects	15.12.94	8.4.98	CONTACT: Ingrid Tenten - Fax: +32-2-299.18.47

(*) Area 1: Integrated Production and Processing Chains - Area 2: Scaling-up and Processing Methodologies - Area 3: Generic Science and Advanced Technologies for Nutritious Foods - Area 4: Agriculture, Forestry and Rural Development - Area 5: Fisheries and Aquaculture.

Marie Curie Research Training Grants

Post-graduate, post doctoral & return grants in all areas of the following programme
Information on Internet: <http://www.cordis.lu/tmr/home.htm>

Programme (and main contacts)	Publication	Deadlines	Areas (and specific contacts)
TRAINING & MOBILITY OF RESEARCHERS	15.9.97	15.12.97	CONTACT: Barry McSweeney / Fax: +32-2-296.21.33 / E-mail: tmr-grants@dg12.cec.be Grants helpline - Tel. : +32-2-295.08.43
INDUSTRIAL & MATERIALS TECHNOLOGIES	15.12.95	31.1.98	CONTACT: Fax: +32-2-295.80.46 / 296.70.23 / E-mail: imt-helpdesk@dg12.cec.be
ENVIRONMENT & CLIMATE	15.12.95	20.8.97 20.3.98 20.8.98	CONTACT: Angel Arribas San Martin / E-mail: angel.arribas@dg12.cec.be
MARINE SCIENCE & TECHNOLOGIES	17.12.96	20.8.97	CONTACT: Elisabeth Lippiatou / Fax: +32-2-296.30.24 / E-mail: mast-info@dg12.cec.be
BIOTECHNOLOGY	15.6.96	1.7.97 1.11.97 1.3.98 1.7.98	CONTACT: Alessio Vassarotti / Fax: +32-2-299.18.60 / E-mail: life-biotech@dg12.cec.be
BIOMEDICINE & HEALTH	17.1.95	31.12.97	CONTACT: Alain Vanvassel / Fax: +32-2-295.53.65 / E-mail: alain.van-vassel@dg12.cec.be
AGRICULTURE & FISHERIES	15.12.94	15.12.97	CONTACT (*): Areas 1,2,3: Alessandra Luchetti - Fax: +32-2-296.43.22 Area 4: Carlos Antolinez - Fax: +32-2-296.30.29 Area 5: Frédérique Wenner - Fax: +32-2-295.78.62
NON-NUCLEAR ENERGY (JOULE component: R&D Projects)	15.6.96	1.7.98	CONTACT: Ingrid Tenten / Fax: +32-2-299.18.47

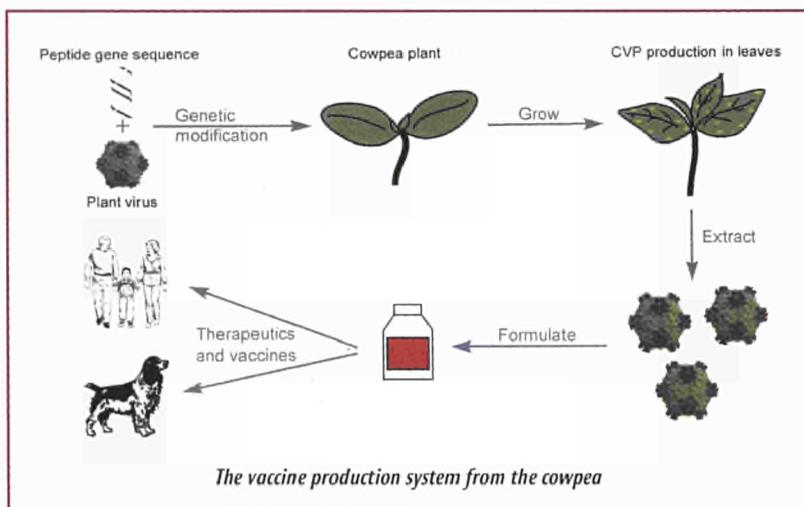
(*) Area 1: Integrated Production and Processing Chains - Area 2: Scaling-up and Processing Methodologies - Area 3: Generic Science and Advanced Technologies for Nutritious Foods - Area 4: Agriculture, Forestry and Rural Development - Area 5: Fisheries and Aquaculture.

"Vaccine plants": a world first for Europe

In a world first, European biologists working together on a Community project have made an important breakthrough in research into producing vaccines from plants. The results of animal vaccine trials are very promising, and may well herald some interesting developments for the human race. The large-scale engineering of inexpensive "edible vaccines" in plant hosts would usher in a genuine pharmaceutical revolution.

It all started with a modest fodder crop, the cowpea (*Vigna unguiculata*) - also known in the English-speaking world as the blackeye bean. Basing their work on a virus that commonly affects the cowpea, European researchers taking part in a FAIR programme project found a way of combating three viral diseases that mainly attack animals: canine parvovirus, mink enteritis and the feline panleukopenia virus.

The virus that infects the cowpea has a feature that makes it eminently attractive from the researchers' viewpoint: its surface is composed of sixty copies of two proteins, one of which has a sort of molecular loop projecting outward. The scientists proceeded in two stages. First, they isolated a *peptide* - a short string of amino acids - common to the proteins of the three viruses in question. Then, they managed to insert the peptide into the multiple loops of the plant virus.



From plant to animal

Consequently, when the plant virus - now carrying sixty copies of the peptide - infects the cowpea and multiplies there, the latter becomes a very abundant source of an important element of the disease-causing virus which can stimulate the animals' immune systems. Once it has been administered to the animals, the modified plant virus will act as an antigen, setting off the production of antibodies just like a vaccination.

All that remains to be done is to harvest the leaves of the infected plant, crush them, and isolate the modified plant virus for use. The system could hardly be bet-

ter: not only are production volumes relatively very high (1 to 2 grams per kilo of undried material), but the plant, having lost some leaves, carries on growing, thereby ensuring sustained production.

Once purified, as controlled tests have confirmed, the modified plant virus becomes a powerful vaccine when administered in appropriate doses (from 100 micrograms to one milligram per animal treated). Since a single kilo of plant material may yield 2000 doses of vaccine, one of the main advantages of the process is clear: its low cost.

The need for an international strategy

"Such research would have been impossible to carry out in a single laboratory given the range of scientific expertise required - from plant physiology to product development, not to mention animal and plant virology, immunology, molecular biology and process development,"

explains Paul Rodgers, development director at Axis Genetics and coordinator of the project (1). "To continue along this path, an international research strategy was needed. Today, this openness brings with it a second advantage - access to the largest markets. In this respect, the European Union can assist by setting up laboratory consortia that can be called on to focus on specific applications for the technology we have developed."

(1) Besides Axis (UK), this project, entitled "The plant as a factory for the production of oral vaccines and diagnostics", (FAIR CT 95 720) brings together the Institute of Animal Science and Health (NL), the Danish Veterinary Institute for Virus Research (DK), and INGENASA (ES).



In time, researchers believe it will be possible to administer vaccines simply by oral ingestion of the active agent. "A practical method which would help enormously in epidemiological prevention campaigns," comments Paul Rodgers. For, it goes without saying, that

if so far the project has been limited to testing the process for producing animal vaccines, the potential benefits for humankind are just around the corner. Certain auto-immune diseases may be preventable, even if not treatable, thanks to the somewhat artificially in-

duced, but renewable attributes of a simple fodder plant. Could we be on the threshold of 21st century phytotherapy? ■

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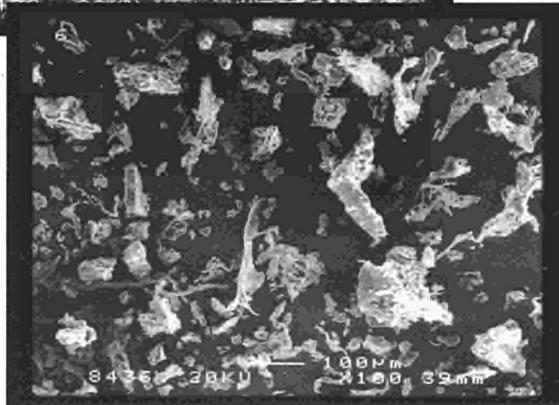
Standards, Measurements & Testing programme

Issues at stake in certified reference materials: the case of asbestos

The pathologies induced by asbestos fibre inhalation represent a sensitive public health issue. Without standardisation, results obtained from analyses of lung samples in different laboratories up to now have been difficult to compare. Thanks to a European research initiative, a strict metrological approach is now making standardisation a possibility in the near future.

The lung ailments caused for decades by asbestos fibre inhalation are recognised today as occupational diseases. Despite significant misgivings about the harmful effects of this material - used not only in the building industry, but also in countless other industrial applications - its use continued for many years, without appropriate precautions being taken.

Today, victims everywhere of asbestos-related diseases are forming groups to claim damages. But for their claims to be upheld, there remains the hurdle of providing individual contamination records and, because contamination may have occurred a long time ago, or been intermittent, these are often vague and subject to question.



Reference samples prepared under the CRM programme: dried and homogenised lung tissue (scanning electron microscope).

An urgent need for standardisation

"Apart from an investigation into the individual's professional history, the only way of specifically assessing the existence and extent of asbestos exposure - and possibly linking it to the pathological condition - is through an objective reading of the fibres present in lung samples collected during surgery or autopsy," explains Doctor Pascal Dumortier, of the Hôpital Erasme (Brussels), a partner in the European project studying the problem. "However, up to now, the thirty or so labs specialising in these biometrological analyses used entirely non-standardised procedures, making all comparisons, and any hopes for a common ap-

proach, difficult."

This failing gave rise to a research project, launched two years ago under the Standards, Measurements & Testing programme. Its aim: to produce a range of "certified reference materials" (see box). These CRMs include, among other things, lung tissue samples collected during autopsies on patients exposed to asbestos, calibrated according to fibre content. "For asbestos-related diseases, it is essential in the course of forensic evaluation and scientific research to be able to compare results from lung tissue samples in terms of the concentration and size distribution of fibres," Dr Dumortier affirms. As a recognised standard, these CRMs will be supplied to laboratories to enable them to adopt a common language in the reporting and interpretation of analytical findings.

From feasibility to practice

In the first phase, five European laboratories, coordinated by the Finnish Institute of Occupational Health (Helsinki), carried out a feasibility study on CRM production for asbestos analysis in lung tissue. This study demonstrated that it was possible to achieve extremely precise measurements from lung tissue specimens which were sufficiently dry and homogeneous.

The project's second phase, still in progress, brings together eight EU laboratories⁽¹⁾. These are responsible for producing a range of op-

erational CRMs to supply to all European centres involved in these analyses. "Perfecting these CRMs - of which several thousand reference samples will be distributed - will provide the metrological tools for determining, according to controlled European standards, whether or not a disease is due to exposure to asbestos," stressed Eddie Maier, in charge of the project under the DG XII Standards, Measurements & Testing programme. "Incidentally, the implications of this research do not interest analytical laboratories alone. Manufacturers of measuring instruments are also looking for CRMs to monitor the precision of their equipment, especially in the electron-microscopy sector. The production of these CRMs is - to our knowledge - a world first. Their distribution outside Europe is, in itself, a not inconsiderable scientific and commercial challenge." ■

(1) In addition to the Finnish coordinator, the following are involved: Hôpital Erasme (Belgium), Health & Safety Laboratory and University of Wales (United Kingdom), Klinikum der Justus Liebig Universität (Germany), University of Oulu (Finland), Laboratoire d'Etude des Particules Inhalées (France), and Hospital Germans Trias i Pujol (Spain).

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The harmful effects of asbestos



PHOTO NEWS

Decontamination work on a building with excessive asbestos levels.

Four principal lung diseases are attributed to asbestos:

Asbestosis - pulmonary fibrosis resulting from significant accumulated exposure to asbestos. Following the adoption of ever-stricter preventative measures, this disease has now become quite rare in its advanced form.

Mesothelioma - a tumour of the pleura or the peritoneum, specifically caused by asbestos. It can emerge decades after exposure ceases.

Fibrosis - excessive growth, extensive or localised, of the connective tissue of the pleura. Less serious than the previous illness, but also closely linked to asbestos absorption.

Bronchial cancer - may be induced by asbestos inhalation, but this disease may have multiple causes - the most frequent of which is smoking.

400 European CRMs

Research for the production of certified reference materials (CRMs), and the promotion of their use by laboratories is one of the important activities backed by the Standards, Measurements & Testing programme. CRMs are representative samples of all sorts of materials, whose precisely defined content can serve as a comparative standard for the validation of analyses.

There are already more than 400 CRMs in use in a wide range of sectors, including biomedicine, the environment, water microbiology, food microbiology, agriculture, and the physico-chemical analysis of industrial materials.

In partnership with the Standards, Measurements & Testing programme (formerly BCR), the Commission's umbrella initiative for Community research on certification, the Institute for Reference Materials and Measurements in Geel (Belgium) manages CRM storage and distribution.

The fight against cancer: a European network



(Françoise Meunier, Director General of EORTC)

The vast network of clinical research coordinated by EORTC (European Organisation for Research and Treatment of Cancer) is one of the spearheads of European cancerology. For some years, this independent body has received significant financial backing from the European Commission. An interview with Professor Françoise Meunier, the Director General.

“We have developed a global and multidisciplinary approach to all aspects of the disease.”

What needs are met by a European network of clinical research?

Françoise Meunier: The considerable progress that has been made in cancer treatment – today some 50% of patients are cured – relies on a dual scientific strategy. Firstly, we have fundamental research, which helps us understand the progression of the disease, and so develop innovative treatments. Secondly, we have clinical research, which meticulously analyses, in selected groups of patients, the effects of new treatments previously tested in the laboratory or on animals.

Recent discoveries in epidemiology, genetics, and molecular biology raise hopes that considerable progress can be made in the long term. But the preliminary groundwork will entail some high quality, rigorous, and independent clinical research, coordinated on a pan-European scale, if we are to obtain valid statistical data quickly and have a genuine impact on medical

practice. Such studies must be conducted by experts in various fields (surgery, chemotherapy, radiotherapy, immunology, pathology, and so on).

But this research extends beyond European borders...

When it was launched in 1962, EORTC took its inspiration from the American *National Cancer Institute* (NCI), with which we have a special relationship. In 1972, the NCI set up a European branch office next to EORTC's Brussels base, and it contributes to our budget on a permanent basis. The exchanges between European and American clinicians have always been very intensive and clinical studies are currently being carried out with the participation of both EORTC and North American groups (Eastern Cooperative Oncology Group, Southwest Oncology Group, National Cancer Institute Canada).

Cancer research is international by its very nature. Out of 6,534 patients in-

cluded in EORTC studies in 1996, 84% were treated in the European Union and 16% were treated in partnership with established cancerologists from Central and Eastern Europe, Israel, Russia, Canada, Saudi Arabia, and Turkey.

2,000 doctors, 100,000 patients, 30 countries

And the profile of the EORTC network in 1997?

It brings together more than 300 hospitals, has more than 2,000 doctors, and its data bank – the Data Center [sic] – centralises findings relating to the treatment of more than 100,000 patients in some thirty countries. Investigations are carried out within thirty or so cooperating groups focusing their work on specific cancers or therapeutic methods.

Research management is handled by a permanent team of some 60 researchers of 14 nationalities based at EORTC Central Office – the Data Center in Brussels. A second team of roughly

twenty scientists work in Amsterdam at EORTC's New Drug Development Office (NDDO). This coordinates pre-clinical studies on new molecules as well as preliminary studies on patients, in close cooperation with the NCI and the United Kingdom's Cancer Research Campaign.

A global and multidisciplinary approach

A research clinic doesn't simply test new drugs...

Indeed, we should draw a distinction between tests studying innovative agents, and so-called therapeutic strategy – or “multicentric” trials – during which assessments are conducted throughout the entire network of clinical investigators, comparing various types of treatments – surgery, chemotherapy, radiotherapy, immunotherapy – administered alone or in combination. The EORTC Data Center – a genuine and unique European centre of excellence – is responsible

for coordinating these studies, which in themselves entail far-reaching cooperation between the university-based scientific world, the pharmaceutical industry, health care institutions and those in the public sector responsible for financing health care.

What are the most recent and significant advances in treatment?

In the course of the last twenty years, treatment of leukaemia in children (70% survival rate), testicular cancer (90% survival rate), Hodgkin's disease (80% survival rate), and sarcomas (55% survival rate) have all made considerable progress. Significant advances have also been made in the treatment of other tumours, especially in terms of quality of life.

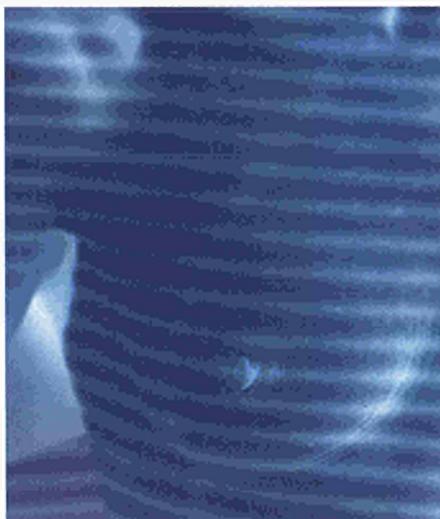
Over and above its clinical work, does EORTC deal with other aspects of the fight against cancer?

EORTC has in fact developed a global and multidisciplinary approach to all aspects of the disease. Our work is also directed at doctors' education, improving the data collected, the efficiency of health care, and prevention. For example, we believe that recovery rates for cancer could increase by nearly 10% if all European patients had access to the latest therapeutic discoveries. That's why the programmes and training grants coordinated by the EORTC Education Office constitute a major part of our activities.

Moreover, for us the human dimension is crucial. Particular attention is given to researchers whose work improves patients' quality of life, and addresses the socio-economic concerns related to treatment costs and their impact on health care systems.

Following its contribution to the development of the Data Center, it is notably in the interests of this broadening of EORTC's activities - particularly within the framework of the action plans of "Europe against Cancer" and the Biomed Programme - that the European Commission is providing financial support for various EORTC projects

addressing patients' quality of life, treatment cost/benefit assessment, and meta-analysis research. Moreover, thanks to the backing of the European Commission (DG XIII), EORTC is playing an active role in the development of high-performance information technologies for facilitating and promoting the implementation of large-scale, Phase III clinical studies in Europe. The centre is now electronically linked to hospitals in



EUREKA SLIDE

Today, approximately 50% of cancer patients recover. And recent scientific discoveries raise hopes for considerable progress in the long term.

the network, allowing clinicians to communicate with each other 24 hours a day.

Ethical and legal issues

Clinical research faces obvious ethical problems...

Carrying out studies on cancer patients is of course a delicate process requiring a balance between scientific expertise and standardised methodologies, and ethical, legal and administrative constraints. The study protocols which EORTC puts into practice are not only subject to approval by a committee of scientific experts (the EORTC Protocol Review Committee), but are also submitted to the competent ethical bodies of each institution in which patients included in these studies receive treatment. All clinical trials managed by EORTC uphold the rules of

Good Clinical Practice, initially developed on a European scale and now standardised by the International Harmonisation Conference, designed to standardise clinical research procedures in the United States, Europe and Japan.

However, although considerable efforts have been made in the last five years in certain countries, we still face a lack of the harmonised legislative and administrative procedures necessary for the prompt launch of studies on an international scale in Europe. For example, when EORTC coordinates a study involving all EU Member States, doctors taking part are confronted with 15 different sets of legislation. Some countries permit the inclusion of patients only after months of administrative red-tape, and sometimes administrative compliance is attained only when the study is nearly finished. As to the compulsory insurance costs doctors are required to underwrite for their patients in certain countries, these can vary by a factor of up to five or more. A specialised unit has been set up at the EORTC Data Center to coordinate bureaucratic procedures and meet the various requirements in each country. It seems critical that EU Member States move towards the harmonisation of their medical, scientific and legislative environments in the field of clinical research. ■

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Molecular tools, a lifeline for biodiversity

The study and conservation of biodiversity represent a major scientific and environmental challenge. Several European research teams are carrying out fruitful work in this field with backing from the Biotechnology Programme.

A result of the long and prodigious evolution of the terrestrial ecosystem, the diversity of the living world – its biodiversity – is now under threat on a global scale. This is a belief most scientists share. Yet, as they are also aware, the major part of this vast wealth remains unknown, for as Biology penetrates deeper into the mechanisms of life, it uncovers ever increasing complexity. The protection of this natural heritage is not only an ethical duty, it means preserving irreplaceable assets from which medical science and agriculture in particular can draw resources as yet unimagined.

BENELUX PRESS



Studying genetic diversity in forest species has led to a new technique for extracting and identifying variations in plant DNA.

From test tube to marketing

It was with this mind that, in 1993, the first Biotech Programme backed the launch of four initial studies on new applications for so-called "genetic screening" tools in the identification of variations between plant and animal species. In 12 countries, 35 laboratories – including four belonging to companies – took part in the work. One of these projects (*Forest Trees*), devoted to studying genetic diversity in forest species, led to a new technique for extracting and

identifying variations in plant DNA. Now marketed by the QIAGEN company, this technology is available in two kits intended for agronomics laboratories. The kits, called DNeasy and RNeasy, make it possible to isolate plant or fungal DNA and RNA easily, and on a small scale, from fresh, dried, or frozen samples.

"The 'European factor' was very important in achieving these results," asserts the Forest Trees project coordinator, Florian Scholz (Institut für Forstgenetik, Grosshansdorf). As Angela Karp of the University of Bristol, overall coordinator of the four projects, explained: "The researchers worked in a structured and efficient manner. During a decisive work session in the course of the project, they were able to compare their operating protocols and results in laboratory conditions. This is how the two separately developed approaches were eventually combined, culminating in the method placed on the market by QIAGEN."

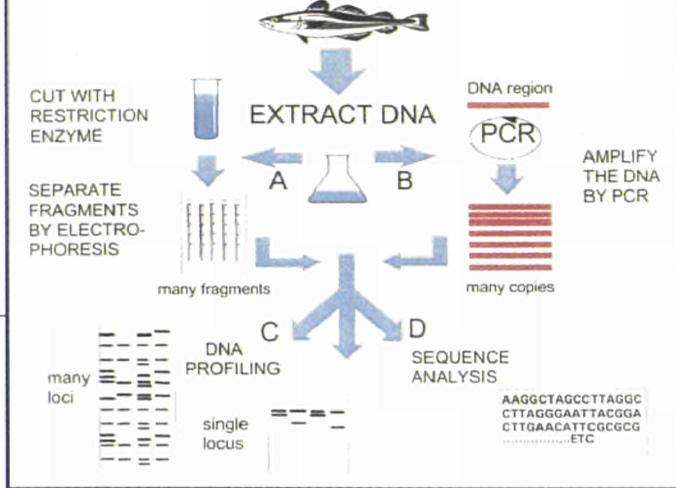
European added value

This "European added value" also applies to the considerable advances made in the standardisation of delicate "molecular screening"

BBP objectives

- Create a forum for dialogue between molecular biologists and end-users to promote an understanding of molecular techniques and their potential applications, and make researchers aware of specific user needs;
- Set up mechanisms to encourage training and technology transfer;
- Ensure a "follow-up" for the users of newly transferred techniques;
- Inform, educate and sensitise the public as to the role of biotechnology in the conservation of biodiversity.

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Molecular screening techniques.

Left: DNA cutting procedure with restriction enzymes (electrophoresis); Right: amplification of specific DNA regions by PCR (polymerase chain reaction); Below: variations in DNA revealed by DNA profiling or sequencing techniques.

techniques used in genetic diversity studies in plants and animals. These molecular tools allow rapid and efficient detection and assessment of this diversity. The use of these techniques on a large scale in international

laboratory networks has been severely hampered up to now by the absence of reliable methods for reproducing results. After testing several detection procedures, a group of 9 European laboratories has selected two

methods that now provide good guarantees for reproducibility.

In 1996 and 1997, six new projects involving 35 laboratories were launched with backing from Biotech 2. In addition, various end-users

have set up an interest group, the Biotechnology for Biodiversity Platform (BBP) (see box). This will provide a dynamic framework for interchange between producers and users of this technology. ■

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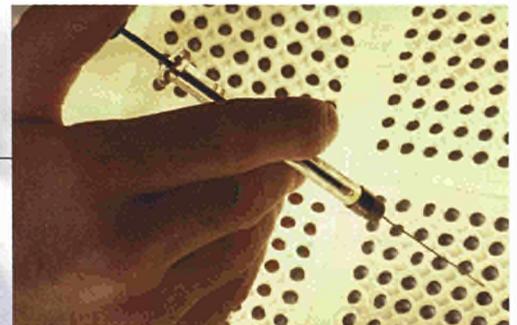
Opinion poll

Europeans faced with biotechnology

In October and November 1996, 15,900 people were questioned throughout the 15 EU Member States on how they viewed biotechnological developments. According to this opinion poll ⁽¹⁾, carried out on behalf of the Commission by INRA (International Research Associates), today's Europeans consider that research in the field is "important", even if they think that in the next twenty years telecommunications, information technology, solar energy and new materials will contribute more to improving their way of life. Although generally "on the optimistic side" - especially in the countries of southern Europe - they are nonetheless aware of the dangers inherent in certain developments and want their opinions on modern biotechnology to be taken into account.

In general, the best-informed individuals - more men than women - greet biotechnological developments with approval. The "objective" knowledge of these Europeans was in fact tested: the average score on the questionnaire, presented in quiz form, was 4.95/10 (with the most knowledgeable being the Dutch, averaging 6.27/10).

But which lines of research appeared the most useful in their eyes? Among the six applications listed (detection, medication, plants, research, food, transplants), 83% thought that the use of genetic testing for the detection of hereditary diseases was both socially useful and morally acceptable. The production of drugs or vaccines came second. The least appreciated applications concerned the



83% of Europeans find the use of genetic testing for the detection of hereditary diseases both socially useful and morally acceptable

food sector and the introduction of human genes into animals for the generation of transplant organs.

On the question of ethics, the majority of Europeans were in favour of checks on what they considered scientific "manipulation" - with genetic engineering in mind. One third expressed confidence in international bodies like the United Nations and the World Health Organisation for carrying out this type of monitoring.

(1) Which follows two polls carried out on this subject in 1991 and 1993

Europeans and Modern Biotechnology, a poll carried out for the European Commission (DGXII-Biotechnologies Unit) by International Research Associates (INRA-Europe) - Publication : Eurobarometer 46.1, February 1997. A copy of this study can be obtained upon request from the Communications Unit of DG XII (Fax: + 32-2-295.82.20; E-mail: info-dg12@dg12.cec.be)

The social sciences' vital insight

Science and society, technology and culture, technical mastery, and our way of life are all inextricably linked. It is in order to ascertain the social consequences of scientific research and technological choices, and enable decision-makers to weigh their options in the light of their socio-economic after-effects, that the European Union has launched the Targeted Socio-Economic Research Programme (TSER).

How can we predict the social consequences of our technological choices? How can we harness new technology to increase employment? How can we prevent the Information Society from becoming a two-track society? How can we transform the phenomenon of exclusion into a process of integration? How can we uphold true equal opportunity? These are the questions that studies backed by the Targeted Socio-Economic Research Programme, or TSER, are trying to answer. This strand of research, integrated into the Framework Programme for the first time in 1994, is in line with the new social dimension that the adoption of the Maastricht Treaty brought to the European Union.

"Research under this programme - often multidisciplinary - aims to shed light on political decisions, to enable us to lay down the groundwork for sustainable economic and social development in Europe," explains Peter Fisch of the TSER Programme.

To ensure its effectiveness - and because it is a question of "targeted" research - the Commission has focused its efforts on three priorities:

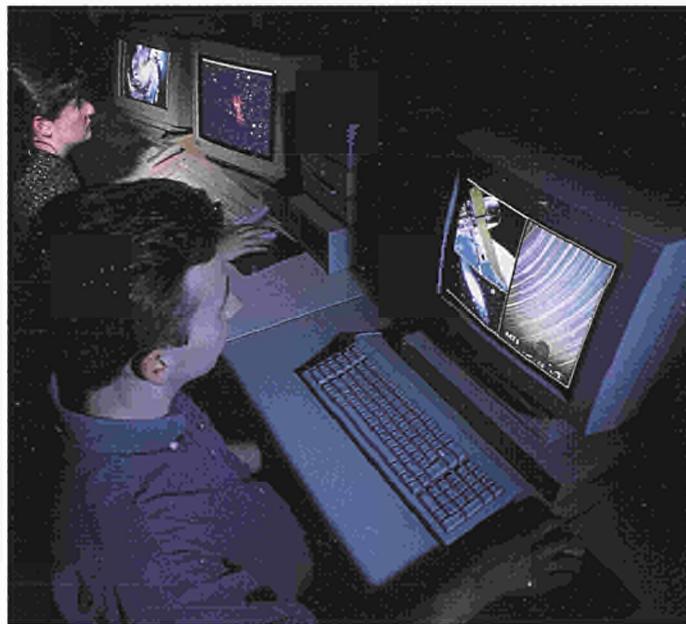
the assessment of political, scientific and technological options; education and training; and social integration and exclusion (see box). The work, conducted by a network of groups of Euro-

Evaluation of S&T policies

"The first field of study is aimed at putting scientific and technological policy and socio-economic problems

cial changes likely to follow in their wake."

The questions are numerous. Does innovation destroy jobs? Does it create others? Who takes the big technological decisions? What is the relationship between S&T policy and other policies (European, national, regional, etc.), especially regarding employment? How can we develop the new services required by an ageing population within a research policy? To what extent will the Information Society improve the quality of private, professional and political life?⁽¹⁾



What is the impact of novel multimedia learning methods on the cognitive process itself?

pean scientists, has the objective of setting up an infrastructure of common and comparable knowledge (data banks, statistics, etc.) and analysing these specific elements (case studies, information on best practice).

into perspective; in other words, appraising the consequences of technological choices on citizens' lives - in terms of employment, quality of life, the environment, etc.," says Peter Fisch. "These studies should make it possible to draw up, implement, and assess scientific and technological policies, while taking into account the so-

Education and Training

When we talk about the "Information Society", we are talking about "education and training". This is the second strand of the TSER Programme, and an essential one in a world where the acquisition of knowledge must increasingly be a life-long pursuit. "If each European country is to remain responsible for its own education system, it is nonetheless important that we set up structures that promote a better exchange of knowledge and information," maintains Peter Fisch.

The teaching of science

and technology, the use of new technologies in education, market needs in terms of vocational training, the teaching of new information and communications technologies, and the inequalities in access to knowledge, are all analysed. Besides specific issues, more complex questions, concerning, for example, the impact of novel multimedia learning methods on the cognitive process itself, are also the focus of TSER research.

Social integration and exclusion

Exclusion comes in many forms, and for reasons both old and new. Young immigrants, the elderly, the handicapped, the jobless and the homeless, all these groups experience their own sense of distance - indeed, of rejection - from the "normal" world. Europe must, therefore, set up integration policies that take these different experiences into account.

In this third strand of the TSER Programme, studies are designed to analyse the main mechanisms (especially the structural changes: urban dynamics, demographic evolution) that lead to exclusion, looking at the contexts specific to each EU country. Various integration policies already in place are analysed, together with the

causes of their success or failure, and, in this context, organisations tackling problems of exclusion on the ground can be tied into the studies.

Going for a third call

After a first call for proposals in 1995, the TSER Programme backed the start-up of 47 research projects (20 for the first strand, 12 for the second strand and 15 for the third strand).

The results of the second call for proposals, launched last year, will be known in the coming weeks. These first two waves of projects should result in support for some 120 studies, involving 500 European teams. A third call for proposals will take place in September. ■

(1) The results of the research carried out on these themes are particularly useful as "raw material" that can be taken up and amplified, should the need arise, within the framework of "ETAN" (European Technology Assessment Network). (See next page.)

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The homeless: beyond stop-gap assistance-integration



"Remedial and preventive measures must go hand in hand, because the causes of homelessness are multiple and complex."

Do the various forms of assistance given to the homeless really answer their needs? Are there examples of "good practice" in this field? What type of social policy should be proposed to the European bodies responsible? These are the questions being studied by the EUROHOME project, which, since 1996, has grouped together Austrian, Danish, Italian, Finnish and Greek research institutes. Their work ran up against some significant hurdles from the outset: the absence of comparable national data on the homeless, and the weak links between the various players involved - be they public institutions or charitable organisations. "Our studies today are halfway there," says Dragana Avramov, doctor of sociology, consultant with FEANTSA (Fédération européenne des associations nationales travaillant avec les sans-abri - European Federation of National Organisations working with the Homeless), and EUROHOME project coordinator. "We have been able to set up a true network, involving some forty experts, who are drawing up recommendations based on genuine knowledge, not superficial understanding and stereotypes." Over and above their basic needs (food, shelter, etc.), the homeless seem also - and above all - to want social reintegration. Yet all too often their situation is addressed solely by implementing emergency measures rather than preventive measures - an approach that would not only be more positive on the human level, but less burdensome in terms of social costs. "Remedial and preventive measures must go hand in hand, because the causes of homelessness are multiple and complex," argues Dragana Avramov. "Along with the problems of poverty and homelessness, there are issues of physical health, mental health, drugs, alcohol, and so on. We can't content ourselves with a general reintegration policy vis-à-vis these populations who are in tremendous need of targeted measures."

Such an approach, embracing both emergency situations and long-term policy, has been tried and tested in Finland - the only European country in which the number of homeless (20,000 in 1987), has fallen by half over ten years. Some 18,000 publicly-funded apartments have been made available to the homeless, along with measures to address the special problems of homeless families (whose numbers have dropped by 70%).

ETAN: a platform for synthesis and debate

Set up during the launch of the Targeted Socio-Economic Research Programme, ETAN (the European Technology Assessment Network) is intended as a platform for synthesis and debate between researchers and political and economic decisionmakers.

The first activities of ETAN (European Technology Assessment Network) have been launched by the European Commission. Its objectives: ⁽¹⁾ to provide policy makers with a strategic synthesis of important S&T policy issues, and ⁽²⁾ to promote debate between experts and decision-makers.

Researchers involved in technology evaluation and foresight want decision-makers to give their findings more

weight. For their part, decision-makers would rely more on the work of experts, if this work were less fragmented and its conclusions more operational. ETAN will help bring the experts and their work closer to decision-makers and their needs. Its mission is to serve as a platform for analysis, synthesis and dialogue between experts and policy-makers. The pilot phase has just been launched covering the following two themes:

- what policy priorities must be implemented by European public authorities, in view of the internationalisation of corporate R&D and innovation strategies, in order to maintain Europe as an attractive location for the development and use of technology?
- as the proportion of elderly people in Europe's demography continues to grow - thanks to progress in science and medicine - how can we ensure that the quality-of-life needs and aspira-

JRC's Institute for Prospective Technological Studies

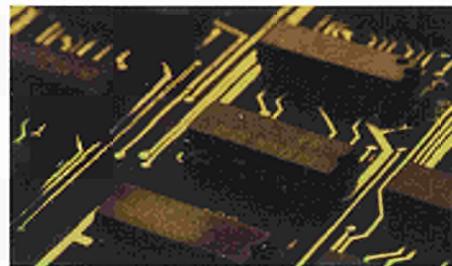
Watching Technology

Within the JRC's Institute for Prospective Technological Studies in Seville, the new European Science and Technology Observatory (ESTO) is getting underway. Its aim: to identify and analyse new world trends in S&T, and inform European policy-makers to help them draw up their RTD strategies.

Science and technology generate fields of new expertise and applications at an ever-increasing rate. To follow developments and keep abreast of these advances as they emerge, you need specialised "spotters", able to observe, filter, and decode the flow of information non-stop. These private or public organisations, which play a strategic role in "technology watch", are found in most EU Member States. Hence the idea of drawing significant European added value from these bodies by bringing them together in a close-knit network. This is the reasoning behind the launch of the European Science and Technology Observatory (ESTO).

The creation of ESTO, with a core of

14 European bodies recognised for their expertise in the field of science and technology watch ⁽¹⁾, is an initiative of the Joint Research Centre's Institute for Prospective Technological Studies (IPTS). "From its Seville base, IPTS is in charge of the coordination and management of the network," explains Claude Tahir, Head of the Technology Watch Unit at IPTS. "We are responsible for detecting, with our partners, new scientific and technological trends that may impact significantly on Europe's future, and presenting the strategic options that follow on from them to political and economic policy makers. The important thing is to contribute to the Community policy-making process."



The Annual techno-economic intelligence report provides a summary of the impact of emerging technologies on European society.

Three priority sectors

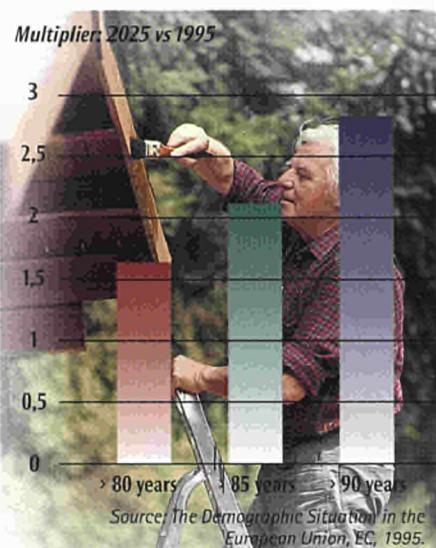
The Observatory has set itself three priority sectors upon which to focus: the dual energy-environment sector, mobility and information technologies, and the life sciences. In each of these scientific and technological fields, ESTO keeps a permanent watch on a great variety of subjects. Findings are channelled into a monthly publication, *The IPTS Report* (also available on the Internet at the address given below), which

tions of this increasingly important group are addressed by technological development and innovation, and associated opportunities for economic growth are seized?

A multidisciplinary approach

On each of these themes, a multidisciplinary group is preparing a report on technology policy issues and options based on a synthesis of the results of various studies carried out in Europe. Each report will then be discussed in a seminar, bringing together experts, political decision-makers, and other stakeholders. A wider audience will be given to the experts' conclusions by the publication of these reports. If appropriate, conferences (or series of national workshops) could be organised bringing together the various socio-

How Europe is ageing



How can technological development meet the needs and aspirations of the elderly in our society?

economic groups concerned.

Under the ETAN pilot phase, work is soon to start on two other themes: responding to the challenges of global climatic change through RTD policy, and the intangible economy and its implications for technology policy, innovation, and employment.

A decisive factor in the added value of ETAN will be openness: subjects chosen after the pilot phase may emerge from research carried out under the Framework Programme (in particular from the Targeted Socio-Economic Research Programme), from synergies established with ESTO, as well as from requests submitted by policy makers and proposals from groups of experts. ■

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for Europe

is published in four languages (English, French, German, and Spanish) and explores the potential socio-economic impact of science and technology development. This report, the IPTS's most visible product, is addressed to decision-makers responsible for managing change. It provides them with a selective and organised presentation of the most significant technical and economic information of the day.

ESTO also carries out, among other things, deeper analyses on selected themes in response to the demands of their clients, which include various European Commission and Parliament Directorates-General. Claude Tahir explains:

"One of ESTO's first tasks was the preparation of an 'Environmental Futures' document, which served as the basis for the position presented by the Commission to the Denver 'G-8' and the Earth Summit in New York last June. Another of our ten base projects involves

Jacques Santer, president of the European Commission, at the Denver G-8 - "Environmental Futures", a document prepared by ESTO, served as the basis for the position the Commission presented to the G-8 and the Earth Summit.

the prospects for, and effects of, electronic trading in relation to the banking sector, taxation and monetary policy."

ESTO is currently preparing a specific contribution to the ETAN activity on "ageing population and technology: challenges and opportunities" (see article on ETAN).

The ESTO network is currently preparing an *Annual techno-economic intelligence report* that provides highlights of technological developments and their impact across Europe.

At a time when the Internet is woven into the world's fabric, ESTO aspires to be a European cross-roads for the exchange and circulation of information that addresses not only Europe's policy-makers, but its businesses and citizens as well. ■



(1) ADIT and OST (France); CEST and SPRU (United Kingdom), ITAS and VDI-TZ (Germany); COTEC (Spain), DTU (Denmark), ENEA (Italy); INETI (Portugal), NUTEK (Sweden), TNO (the Netherlands); VITO (Belgium); VIT (Finland). The observatory may also develop relationships with other watch organisations outside the base network.

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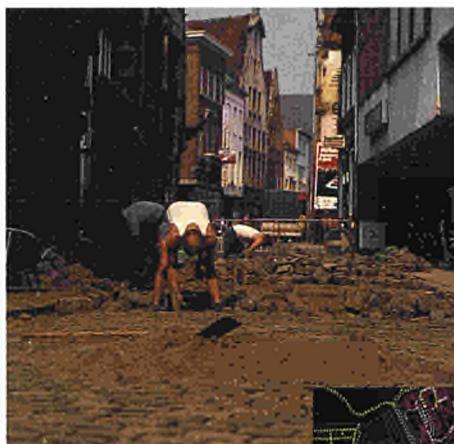
Keeping Europe's taps running

Europe's drinking and wastewater infrastructures are under threat. Ageing systems - once almost thought of as indestructible - are losing too much water. European standards for performance assessment of the systems are lacking. Expertise is normally restricted to a national or regional level. COST Action C3 "Diagnosis of Urban Infrastructure" is providing Europe-wide integrated support to the water industry in its attempts to remedy the situation.

In Northern Europe, attitudes to water supply are changing. No longer is drinking water thought of as a low cost resource. The situation in parts of Southern Europe is different. Water rationing is a way of life in some areas, and consumers appreciate the value of the resource, using their water wisely. The backgrounds are different but water utilities share a common problem - supply systems leak too much. Europe's underground water infrastructure is suffering from the combined effects of ageing and the stresses caused by urban development. Mains bursts and sewer collapses are major consumer inconveniences, cause commercial losses and can spell gridlock to urban traffic. Leakage from wastewater pipes and discharges to the environment are obvious pollution hazards. COST Action C3, "Diagnosis of Urban Infrastructure", is defining courses of action which will help European water companies tackle the problems.

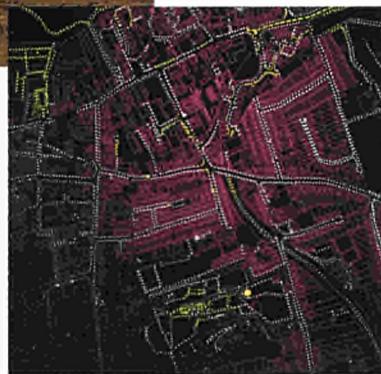
Fragmented expertise

The Action was the brainchild of Professor Daniel



BENELUX PRESS

Network of an urban underground: water pipes are an infrastructure which has to take account of many external factors.



Mains bursts and sewer collapses are major consumer inconveniences, cause commercial losses and can spell gridlock to urban traffic. Leakage from wastewater pipes and discharges to the environment are obvious pollution hazards.

Faudry of the *Institut de l'Economie et de la Politique de l'Energie*, Grenoble, France. He realised that there was a severe lack of knowledge and information exchange in this field, at the European level. Having gained French government support, the Action was granted COST status at an intergovernmental meeting in mid-1994, physically getting underway in early 1995. It currently numbers ten

countries among its members⁽¹⁾ and more have applied to join.

Key to the philosophy of the Action is the recognition of the problems faced by the European water sector due to its fragmented nature. As a consequence, one of its major objectives is to collect and analyse data which will allow the development of a standard performance measure for water and wastewater systems. This information

is also a key to identifying gaps in research and future propositions.

Practical impact

The Action has already made a practical impact, as management committee chairman Gerard Jones, of independent environmental research and consultancy WRc plc, explains. "At this stage, our technical objectives are largely diagnostic. The first step is to ensure that everyone is talking the same language and that performance measurements are comparable. We are promoting an increasingly integrated European approach to information exchange, as a first step on the route to developing solutions to the leakage problem. This is particularly important for the supply side of the industry. Utility companies vary in size from national to municipal, have hugely different levels of expertise and RTD capability, and operate under every imaginable kind of management structure. Improving the communication of knowledge is vital."

Almost two years into the action, the management committee felt that there

was sufficient common ground to warrant organising a two-day workshop. The meeting, *Urban underground water and wastewater infrastructure - identifying needs and problems*, was held in Brussels in June 1996 and was attended by delegates from all sections of the water industry. A number of definitions were agreed and priorities set. These all have the ultimate aim of turning an industry traditionally used to reacting to problems - such as burst water mains and sewer collapses - into one where proactive management and planning would prevent such problems in the first place.

Spreading the gospel

But how to spread the gospel right down to ground level? The strategy adopted by the partners in their efforts to bridge the communications gap is effective and simple. Since the Brussels workshop, the committee has organised its meetings such that they complement nationally organised workshops. The first such meeting, held in Italy, allowed COST committee members to communicate the wider perspective to an audience of regional government officials and Italian water company representatives. The second, in France, allowed French water researchers to present and review their research focus. The next will be held in Hamburg, in conjunction with a major pipe-work conference.

"There is a much improved international level of understanding of the interactions of water infrastructures with urban environments," says

Dr. Jones. "For example, everyone agrees that tree planting programmes improve the quality of life for city dwellers, but the job of the water industry is to ensure that the roots are not eventually going to damage underground pipes."

The Action has made solid progress, but there remains much to achieve. Dr. Jones uses a vivid analogy. "Water supply and waste pipes are like arteries and veins. When there is no other solution, the medical profession treats problems with surgery. But now there is much more emphasis on prevention through education and healthy lifestyle. We must do the same. We are engineers trying to be doctors." ■

(1) Partner Countries: Belgium, Denmark, Finland, France, Germany, Italy, Portugal, Sweden, Switzerland, United Kingdom.

COST and the Urban Civil Engineering Sector

A relatively new COST sector, urban civil engineering combines town planning, urban design and civil engineering so as to contribute more effectively to the management and operation of the physical urban environment. Traditional approaches to civil engineering in the urban context tend to be determined by sectoral and investment interests. The approach adopted in COST, by contrast, is more holistic and innovative in that it sees the urban context in terms of an interrelated system. Indeed, it is the only programme of its type in Europe. There are clear links too with the transport sector and with some of the work being undertaken in COST in both the environmental and social science areas.

Some eight COST Actions have been launched in this sector. They span a range of fields including architecture, civil engineering, town planning and management, cultural heritage, construction designs and civil security and public health. A key aim underlying all the Actions is the desire to promote multidisciplinary research and to influence the way in which urban design and civil engineering are carried out in practice. The main achievement to date has been the creation of new research networks both within and between the various Actions.

COST Ministerial Conference - Prague, 27 May 1997

Ministers responsible for science and technology from the 25 Member States of COST met in Prague on 26 and 27 May 1997. To mark the occasion of 25 years of the COST framework, a ceremonial session took place in the historic Aula Carolina room of the Charles University, where speeches were given by the Czech Minister for Education, Mr. Ivan Pilip, Commissioner Mrs. Edith Cresson, a representative of the Netherlands EU Presidency, the Swiss Nobel Laureate in Chemistry in 1991, Prof. R.R. Ernst, Prof. Jiri Ctyroky, who elaborated on the Czech participation in COST Actions, and Mr. Max Metzger, Chairman of the COST Senior Officials Committee.

The working session of the Conference decided to approve and welcome the membership of Estonia, Malta, and Romania, thus bringing the number of full members of COST to 28 European partners. As to recent applications for full membership from other European states (Bulgaria, Cyprus, Latvia and Lithuania), the Conference invited the Senior Officials Committee to decide on these applications as soon as possible.

Ministers held a further exchange of views on the perspectives of COST, in particular in the light of the conclusions of a recent external evaluation, which presents recommendations to further increase its flexibility and efficiency.

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Back to school under the sign of the Net

Thousands of primary and secondary schools will participate in "Netd@ys Europe" from 18 to 25 October this year. Through this event, the European Commission's DG XXII hopes to help schools take a leap into the information society. This initiative is coupled with the second European educational software competition.

In 1996, fewer than 5% of Europe's schools had access to an inter-school electronic network or the Internet. While the extent of underdevelopment varies from one country to the next, there is, nonetheless, cause for concern: although learning to use new information technology is decisive at primary and secondary school level, both levels remain weak links in the educational chain.

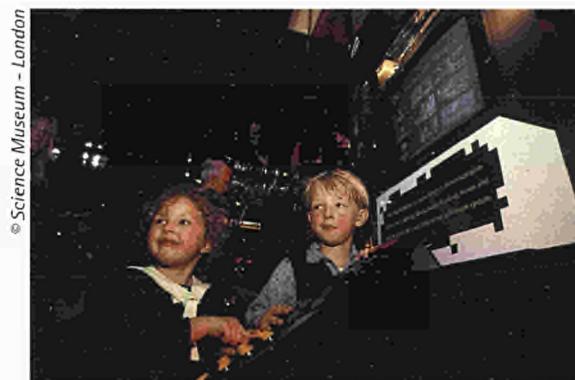
There are many reasons for the difficulties schools face in this sector: the content of multimedia products available on the market is often ill-adapted to educational needs, teacher training in new technologies leaves much to be desired, and frequently school budgets cannot stretch to considerable new investments. That said, we may be forgiven for wondering if there is not a certain dearth of awareness and curiosity - especially concerning the experiences of other European states - on the part of the educational heads of these institutions.

Creating a new network

The "Learning in the Information Society" programme endeavours to bridge this gap through targeted actions designed to stimulate the establishment of public/private partnerships. Two of these initiatives, of a particularly practical nature, deserve special attention.

The first concerns the organisation of "Netd@ys Europe", to be staged concurrently in the fifteen Member States from 18 to 25 October 1997.

The idea hails from the United States, where, last year, it was welcomed as a



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Promoting greater awareness of the educational and practical value of the new tools on offer in the Information Society.

great success at national level. With the joint participation of individuals, local authorities, businesses and other bodies, no fewer than 20% percent of America's schools were able to take advantage of Internet linkups during Netd@ys.

The week devoted to raising European awareness is founded on the same principle, taking into account the diversity of systems and cultures which characterise our countries. The action will rely first on communications networks which already exist in certain schools, in order to acquaint the public with the technology and encourage similar experiences throughout the EU. Netd@ys will also serve as a broad-based information exercise - aimed at schools, public authorities and business - highlighting the potential benefits of school networking, and the educational and practical value of the Internet. The ultimate goal of this event is to foster the creation in each Member State of between five and ten networks or new projects, based on the synergy between schools, public authorities and business.

Basing themselves on the American

experience, the organisers are counting on partners from institutions and from the private sector to share the costs of linking classrooms to the Internet. The European Commission will contribute by co-financing the activity sessions accompanying the link-ups.

A call for creativity

The second competition for "European educational software for schools" is one of two Community initiatives in this field scheduled for the beginning of the next school year. The first competition, staged in 1996 in the framework of the European Year for Life-long Learning, was an unqualified success with nearly 500 projects submitted. Today, schools and classes are invited to develop, on the Internet or on disc (CD-Rom or diskette), a multimedia presentation on a topic of European interest such as culture, environment, citizenship, or the fight against racism. The competition comprises two categories: one for primary and secondary schools and technical institutes, the other for higher education establishments and specialised multimedia training institutions.

Multimedia projects must be received by designated national education authorities for selection before 30 September 1997.

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