

Innovation & Technology Transfer

4/94

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FLAIR-FLOW: A Focused Dissemination Network

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• TELEOPERATED ROBOTS • AND MORE



DG XIII-D

Directorate for Dissemination
and Exploitation of RTD Results,
Technology Transfer and Innovation



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INNOVATION & TECHNOLOGY TRANSFER

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Exploitation of Research

DIRECTORATE XIII-D

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Evolution of European Research

June and July 1994 see several important milestones in European R&D

A HAZARD OF PUBLISHING ANY NEWSPAPER is that during the publication process events move on, sometimes in significant ways. This is especially true for this issue of *Innovation & Technology Transfer*.

As it goes to press, important developments are in sight in several areas of interest to the research and technology transfer community. By the time this issue reaches many of its readers, some of the topics which it covers will have evolved, no doubt in interesting directions.

FIRSTLY, THE EUROPEAN UNION 'SUMMIT' MEETING AT CORFU on June 24-25 will be a milestone in the work of the two Task Forces set up to pave the way for the trans-European networks envisaged in last year's White Paper on growth, competitiveness and employment (see *Policy News* in the last two issues). As far as information and communications technologies are concerned - see article on facing page - the Bangemann Task Force seems sure to set the agenda for some time to come.

SECONDLY, RESEARCH MINISTERS ARE TO EXAMINE a number of Specific RTD Programmes under the Fourth Framework Programme at a Council meeting in Luxembourg on June 27 (see page 4). Their conclusions will therefore be known as readers receive this issue. Decisions taken at this meeting will of course affect the timetable for the implementation of the programmes concerned, and so are of great importance to all potential research project participants.

THIRDLY, THE EUROPEAN PARLIAMENTARY ELECTIONS took place right across the European Union on June 9-12. The first meeting of the new Parliament will be in the second half of July. Although research matters have not been a prominent issue in the election campaigns, the Parliament plays a crucial role in this as in all areas of the European Union's activities, so the composition of the new Parliament is of importance to the research community.

Innovation & Technology Transfer will report on all these events in the next issue, to be published in September. In the meantime, this issue provides a number of interesting stories: the experience of FLAIR-FLOW may well prove valuable to those in charge of disseminating research results (see *Dossier*), as may French VRC FIST's experience in negotiating the intellectual property rights between research institutes and an international biotechnology company (see *VALUE News*), to name just two examples. ■

ICT Round Tables Under way

"A Partnership in ICT", a Memorandum of Understanding resulting from the Information and Communication Technology (ICT) Partnership, is gathering signatories, and the first round tables are being organised.

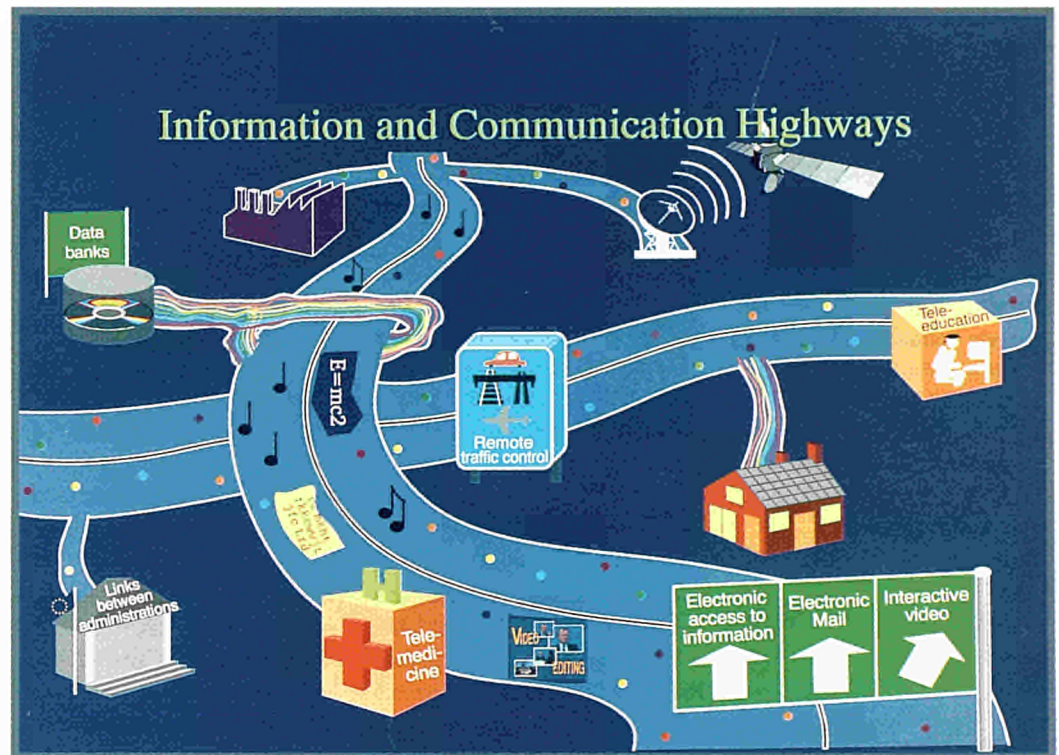
The ICT industry is changing. In the past the market was technology-driven, with vendors defining the products and customers having to accept what was offered. There was little critical response from the users on how ICT products should support their activities. The 'demand-pull' phenomenon, however, is definitely appearing, with user needs beginning to help define tomorrow's products.

It is, however, early days. Users and vendors are not yet equal partners in technology management, and users' knowledge of how best to use ICT still lags far behind the vendors' ability to produce it. This also explains why vendors have been able to build a stronger relationship with the European Commission.

The ICT Partnership aims to level this playing field and give all three sides of the 'user-vendor-Commission' triangle equal strength, enabling the European ICT industry to better exploit one of the near future's most important markets.

User Involvement

Around 25 associations of users, vendors and ICT professionals met in June and September last year to discuss these issues with the European Commission. They adopted 'User Involvement in ICT Policy', a paper charting the way forward in this evolution. The paper surveys the user community and proposes ways of organising cooperation, improving information accessibility and input into policy-making, possible common actions and more. The participants also asked the Commission to prepare 'ICT Information Sources', a guide to help organisations access existing information sources.



Information Highways will both enlarge the ICT market and increase competition, making user input essential to industrial survival.

The paper concludes by observing that, although equalising all sides of the triangle will not be simple, each improvement along the way will make an important contribution, if the benefits are shared by all the partners. For this reason, the participants signed 'A Partnership in ICT', a Memorandum of Understanding (MoU) specifying the principles by which these many and varied organisations can cooperate and guide ICT policy-making.

The 30+ signatories to 'A Partnership in ICT' have agreed to:

- improve mutual communication - in particular by allowing users to use their own terminology when specifying their requirements for ICT products and services;
- explore and test various meth-

ods of cooperation, such as round table meetings, liaison functions, cross-membership and common initiatives;

- seek regular, updated information on ICT policy from the European Commission and other policy-makers and, where relevant, send this information to the other signatories;

- contribute to meetings in the European Commission where important changes to ICT policy will be discussed. Each contribution should, if possible, represent the common position of other signatories with similar interests;

- propose common actions which tangibly contribute to an EC programme or the implementation of ICT policy. Funding from the European Commission will be sought

for these actions;

- ensure that all cooperations organised by the signatories will support the Community policy of open systems and international standards.

Round Tables Under way

Any signatory can initiate a common action involving other signatories by first calling a round table. Eight round tables are currently being organised, with more than ten signatories wishing to participate in each:

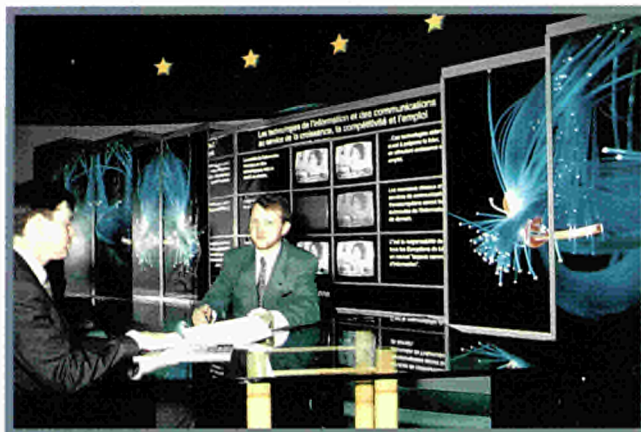
- strategic view of ICT in Europe;
- users' needs for trans-European services;
- universal service;
- procurement of ICT products and services;



- translating business needs into user specifications for standards;
- architecture for multivendor networks and platforms;
- review of Community standards policy;
- access to Community information for users.

These round tables are the first step towards a more open and efficient ICT policy in Europe. An Information Pack, including all the texts, application forms for the MoU and the first edition of 'ICT Information Sources', is available free from the European Commission.

INFORMATION STAND ON ICT



The joint DG III/DG XIII stand at 'Sources d'Europe'.

A permanent Information Centre on the European Union, including a joint stand from DG III (Industry) and DG XIII (Telecommunications, Information, Market and Exploitation of Research), was opened in Paris on March 18.

'Sources d'Europe' is the first

major centre of its type, and is expected to deal with some 150,000 information requests every year. Located at "L'Arche de la Défense" in Paris, it offers the general public a variety of services, including a media library, a current affairs room and a bookshop.

The aim of the joint DG III / DG XIII stand is to provide information and advice on aspects relating to ICT and industrial policy to both the general public and specialised audiences. There is also a CORDIS desk, and more in-depth activities such as seminars, round table discussions, lunch-time debates, project demonstrations and meetings of experts.

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► FOURTH FRAMEWORK PROGRAMME

Continuity in EC RTD

Over half of the Specific Programmes of the Fourth Framework Programme have been approved by the European Parliament.

As noted in the last issue of Innovation & Technology Transfer, by late April the total budget of the two Fourth Framework Programmes (for RTD & Demonstration and for the European Atomic Energy Community) had been set at 12.3 billion ECUs, with another possible 700 MECU to be made available by mid-1996.

On May 5, the European Parliament voted to adopt the Commission's proposals for twelve Specific RTD Programmes. The programmes, which had already been examined and passed with amendments by CERT (the Parliament's Committee on Energy, Research and Technology), were also

submitted to the European Council for consideration on June 27.

The twelve programmes are:

- Telematics;
- Advanced communications technologies and services;
- Information technologies;
- Industrial and materials technologies;
- Measurement and testing;
- Marine sciences and technologies;
- Agriculture and fisheries;
- Non-nuclear energy;
- Non-nuclear research activities of the Joint Research Centre;
- Targeted socio-economic research;
- Cooperation with third countries

and international organisations;

- Stimulation of the training and the mobility of researchers.

The first ten of these programmes fall under the First Activity of the Framework Programme, while the last two concern the Second and Fourth Activities, respectively (1).

The adoption of these programmes by the Council will clear the way for the European Commission to convene the relevant management committees. As these committees are responsible for the Calls for Proposals, the first can be expected by September 15.

The remaining programmes are:

- Environment and Climate;

- Biotechnology;
- Biomedicine and Health;
- Nuclear fission safety;
- Nuclear activities of the JRC;
- Transport;
- Dissemination and Optimisation of Results (Third Activity).

These programmes will await the new Parliament in the autumn, so their Calls for Proposals may be ready for December 15, ensuring continuity for all European RTD Programmes.

(1) For more details on the Fourth Framework Programme's structure, see edition 1/94 and the May 20 special supplement to CORDIS Focus.

► **CASE STUDY: VRC**

Patenting a Growing Industry

Launched under the ECLAIR Programme (1), the OPLIGE project has already yielded significant results, including a number of patents. A French VRC played a crucial role in negotiating the intellectual property rights between the Belgian, British and French inventors.

OPLIGE stands for 'Optimisation of Lignin in Crop and Industrial Plants through Genetic Engineering', and was launched in 1989 by eleven universities, research institutes and companies in Belgium, France, Germany, Spain and the UK. However the roots of the project, according to Dr Claire Halpin of Zeneca Seeds, go back to the early 1980s.

"The coordinator of the OPLIGE project is Professor Alain Boudet, from the Université Paul Sabatier in Toulouse. He had been working with our 'corporate ancestor', ICI Seeds, on the manipulation of the lignin content of plants well before the ECLAIR Programme launched its Call for Proposals in late 1988," she explains. "The EC support allowed the expansion of this collaboration to include a larger number of partners and accelerate the technological developments. In fact I believe that OPLIGE is, both in terms of budget and number of partners, one of the largest in the ECLAIR Programme."

Some of the OPLIGE partners are industrial companies, reflecting the economic importance of lignin. It is a complex aromatic polymer which waterproofs and strengthens the cell walls of plants ranging from forage grasses to forest trees. Lignin has to be removed from wood before paper can be made - an expensive and environmentally difficult process - and limits the digestibility of forage crops.

When the project began, the 'molecular pathway' - the chain of chemical reactions leading to the production of lignin - was already understood. There are three key enzymes - CAD, CCR and OMT - which catalyse the production of lignin, so by reducing the production of these enzymes the content



Photo: Zeneca Seeds

The sub-surface lignin tissues of transgenic tobacco stems with modified lignin (right) contrast sharply with those of normal tobacco (left).

and chemical structure of the lignin could be favourably modified.

"The key was to find the genes responsible for the production of these enzymes," Dr Halpin continues. "Zeneca's collaboration involved manipulating lignin in tobacco, due to its fast growth rate and similar lignin percentage to many trees. We first purified the enzymes to get a better picture of the responsible genes, and then developed genetic libraries to isolate them. The OPLIGE project was the first group in the world to do this, and we submitted patents in 1991."

Culture Clash

Of course, the different partners had different priorities regarding intellectual property rights, or IPR. Last year 'France Innovation Scientifique et Transfert' (FIST), one of the French VRCs, became involved to help one partner in the project, the French public research laboratory CNRS, negotiate the IPR agreements.

"Basically, by that point it would be fair to say that communications between the partners were less than perfect," recalls Jennifer Binder, from the French VRC. "On the one hand you have a French public research laboratory, who

had no plans to exploit the research, and on the other you have an international biotechnology company whose goal was to do just that from the beginning. There was a perfectly understandable culture clash, and it had little to do with language."

FIST set about to bridge the gap. While Zeneca wanted exclusive rights to sub-license the technology to companies outside the project, CNRS had little idea of the market value of the technology. This made negotiating difficult, so FIST applied for and obtained a Valorisation project to enable Anne-Catherine Jouanneau, a biotechnology expert and Chief Executive of FIST, to make a technological and economical evaluation of the project.

Negotiations then began in earnest for a technology transfer agreement governing the patents, involving the CNRS, Zeneca and the University of Ghent in Belgium, who were all listed as co-inventors on the patents. The agreement was that the public researchers would continue to use the technology for their own purposes, with Zeneca having exclusive rights to sub-license it worldwide, allowing them to profit from the technology.

VALUE IN BRIEF

The EC Programme for the Diffusion and Utilisation of Scientific and Technological Research Results, **VALUE** was extensively covered in issue 1/94 of *Innovation & Technology Transfer*.

To contact any of the **VALUE** Relay Centres (VRCs), consult the 'Quick Reference Guide', which was included in the same issue. To order this issue, see the **Subscription Form** on the back page.

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Major Business Interests

Then RAGT, a French plant breeding company involved in the project, objected. "EC research contracts usually include a clause allowing companies to object to the sub-licensing of a technology which they helped develop in a project," explains Miss Binder. "The technology has to be relevant to their major business interests, which are listed in the contract. It turned out that few of the partners had read what the other partners' major business interests were."

The solution was to split the negotiations from one agreement that embraced all the genes to a

number of agreements, each focusing on one gene. This enabled each partner to protect their business interests on a case by case basis.

The first agreement, concerning the transfer of the rights to the CAD patent, was concluded successfully earlier this year. Negotiations focusing on the other patents are now well underway with an expanded group of partners, including INRA, another French public institute. In all agreements, Zeneca is aiming for exclusive rights to sub-license the genes in forestry applications, while RAGT will focus on their interests on forage crops.

"For FIST, this was a test case in negotiating the IPR resulting from an EC project," Jennifer Binder concludes. "We've learnt that EC research partners, particularly public laboratories, often do not fully understand their legal obligations, and that the communication gap between the private and public sector is often profound. The VRCs are often well placed to bridge that gap."

For Zeneca Seeds, the conclusion of the negotiations mean that they can now exploit the results of research begun a decade ago. But they are still prepared for the long term. "We expect that the first transgenic trees with altered lig-

nin will appear in around 10 years," Dr Halpin concludes. "Trees grow slowly, and so will this investment, maturing sometime between 2010 and 2020." □

(1) *Agro-Industrial Research under the Second Framework Programme (1987-1991). See page 15 for another ECLAIR Case Study.*

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► CASE STUDY: VALORISATION

Supporting Technology from Concept to Product

Analysing the integrity and surface chemistry of coatings is becoming increasingly important to hi-tech industries ranging from aerospace to computer hardware. A new microscope, currently undergoing industrial trials with VALUE's support, represents a major step forward in the field, and appears likely to capture a substantial market in R&D laboratories worldwide.

The original concept for the PEAT (Photo Electron Auger Thermal Wave) microscope was developed in the mid-1980s in Ireland by Dr Liam McDonnell and Dr Eamonn Cashell, of the Cork Regional Technical College's Department for Applied Physics and Instrumentation.

"To begin with, we received enough support from the Irish government's venture capital company to explore the concept and set up Tekscan, a campus SME," recalls Dr McDonnell. "By the late 1980s we had developed a laboratory prototype of the microscope, for which Tekscan has now been granted American and European patents. We hope that a Japanese patent will be approved later this year."

The patents are important because of the microscope's significant industrial applications. Its main strength is its ability to non-

destructively find and chemically analyse defects below the surface of a coating. This is vital to the development of better coating processes, because by comparing a well-bonded region of the coating to one containing a defect - such as a void between the coating and the 'substrate', the component onto which the coating has been placed - scientists and engineers can gain important insights into how to make their coating processes more efficient.

"The microscope's crucial feature is that it detects and chemically analyses subsurface faults before they cause a failure in the component," Dr McDonnell points out. "Other analytical techniques examine the fault after it breaks through to the surface and becomes contaminated by air. That's like studying a horse by the hoofprints it left as it bolted from the stable - in oth-

er words, less than perfect. Before this microscope, however, it was often all coating scientists could do."

Digging Below the Surface

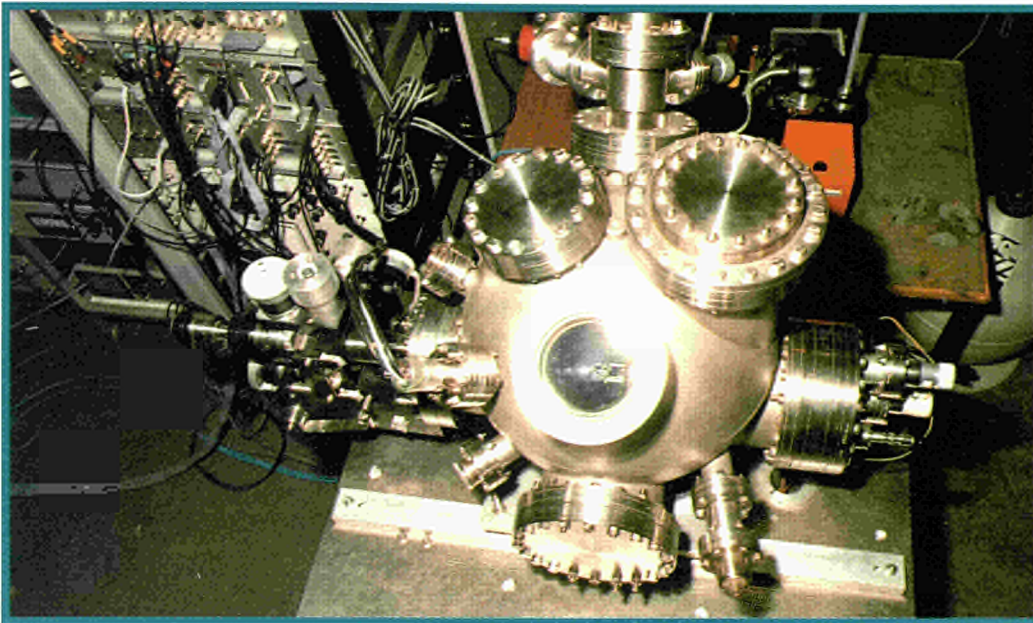
The PEAT microscope in fact combines three instruments. To begin with, the sample is placed in the ultra-high vacuum (UHV) chamber and scanned with an electron beam, producing a standard electron microscope image of the sample's surface.

The second stage is more complex. This time the sample is scanned with an electron beam which has been 'chopped', or turned on and off, creating thermal waves. "Whenever any object is struck by a packet of energy it is heated, so each pulse of the electron beam heats the piece of the sample it strikes," Dr McDonnell

explains. "This heat starts radiating throughout the sample straight after the pulse, but another pulse of electrons is not far behind, so the temperature of the piece 'under fire' is continually rising and falling in response to the electron beam, generating a thermal wave."

"We monitor how the sample reacts to this input of thermal energy - the sample's 'thermal response' - by using a piezo-electric transducer, which measures the acoustic signal generated by the expansion and contraction of the sample's surface," he continues. "The thermal response, of course, depends on the chemistry of the sample - metal, for example, will conduct the heat away much faster than ceramic. Most importantly, voids and impurities within the sample slow the heat transfer, and this shows up on our instruments. Lastly, we can identify the location

Photo: Cork Regional Technical College



The prototype PEAT microscope, dominated by an ultra-high vacuum chamber.

of these subsurface defects with great precision, because we can decrease the volume of the piece being probed simply by increasing the chopping frequency."

Once the defect sites are identified the microscope's third instrument is brought into play. An ion beam is focused on the site, boring a microscopic tunnel through the sample straight towards the defect. An electron beam is also focused on the site. As the atoms of the sample are struck by the electron beam they emit 'Auger electrons', which have a kinetic energy characteristic of the atoms they originated from. Therefore a profile of the chemical composition of the coating, starting at the surface and going right into the defect, can be obtained.

"The real beauty of the system is that Auger electrons can only travel through the solid sample for a few atomic layers, so we know that the electrons that reach our detector come from atoms right at the surface of the hole," Dr McDonnell adds. "It's a little like archaeology, digging through the sample and analysing it almost one atomic layer at a time."

Industrial Development: BRITE & EURAM

In 1987 the College team joined two EURAM (advanced materials)

projects, with Tekscan joining a BRITE (industrial technologies) project in 1989. In all three projects the prototype microscope was used to characterise and analyse the surface integrity and chemical structure of the new coatings developed by the other partners.

The three projects illustrate the diverse range of industries concerned with developing new coatings, and the size of the microscope's potential market:

- Both EURAM projects were led by French company Hydromécanique et Frottement, specialists in providing advanced coating services to industry. The similarity ends there, however: one project developed new aluminium-nitrogen alloys, along with the associated production processes, to replace the silver, gold and other precious metals used in the electronics industries; the other worked on a plasma spray coating system to produce auto-lubricating ceramic coatings for automobile engines;
- The BRITE project was led by a laboratory within TNO, the Dutch national research association. Together the partners examined silicon carbide-silicon nitride composite coatings, created using the 'plasma enhanced chemical vapour deposition' (PECVD) method, which can synthesise these coatings well below 500°C. Such coatings are expected to have excellent wear- and

corrosion-resistant characteristics.

"These projects were a great opportunity for us to develop our prototype," continues Dr McDonnell. "They allowed us to test and refine the various elements making up the microscope on a wide range of samples in real, industry-oriented problems. For an academic team such as ourselves, this introduction to so many different industrial companies was essential. It helped us orient the prototype to industrial needs and identify what has to be done to make it credible in corporate circles."

VALUE: Industrial Trials

The three RTD projects were finished in the first years of this decade. Tekscan had a working prototype with reasonably good test results, but dwindling development resources.

"We spent practically our last resources commissioning a market study," Dr McDonnell remembers. "It showed that the various elements had to be integrated together better, so that we could demonstrate to the marketplace that the system could work as a single unit. We also needed a wider range of industrial test results, and more sophisticated data presentation software - the importance that corporate culture attaches to a user-friendly, full-colour display was, to

an academic such as myself, very surprising."

"On the upside," he continues, "the market research also showed that there is a market for around 50 microscopes around the world, costing in the region of 400,000 ECU each. What's more, there are potential spinoffs - it showed that a thermal wave imaging system based on a laser could prove highly marketable for more routine quality control and assurance applications. I think the fact that we had already commissioned market research and developed a business plan before we applied for a Valorisation project in 1991 improved our chances."

The Valorisation project, worth almost 80,000 ECU, was granted in late 1992. As a result, the partners have already improved both the image processing and display software and the system for introducing the sample into the vacuum chamber, which took far too long on account of the requirement for an ultra-high vacuum.

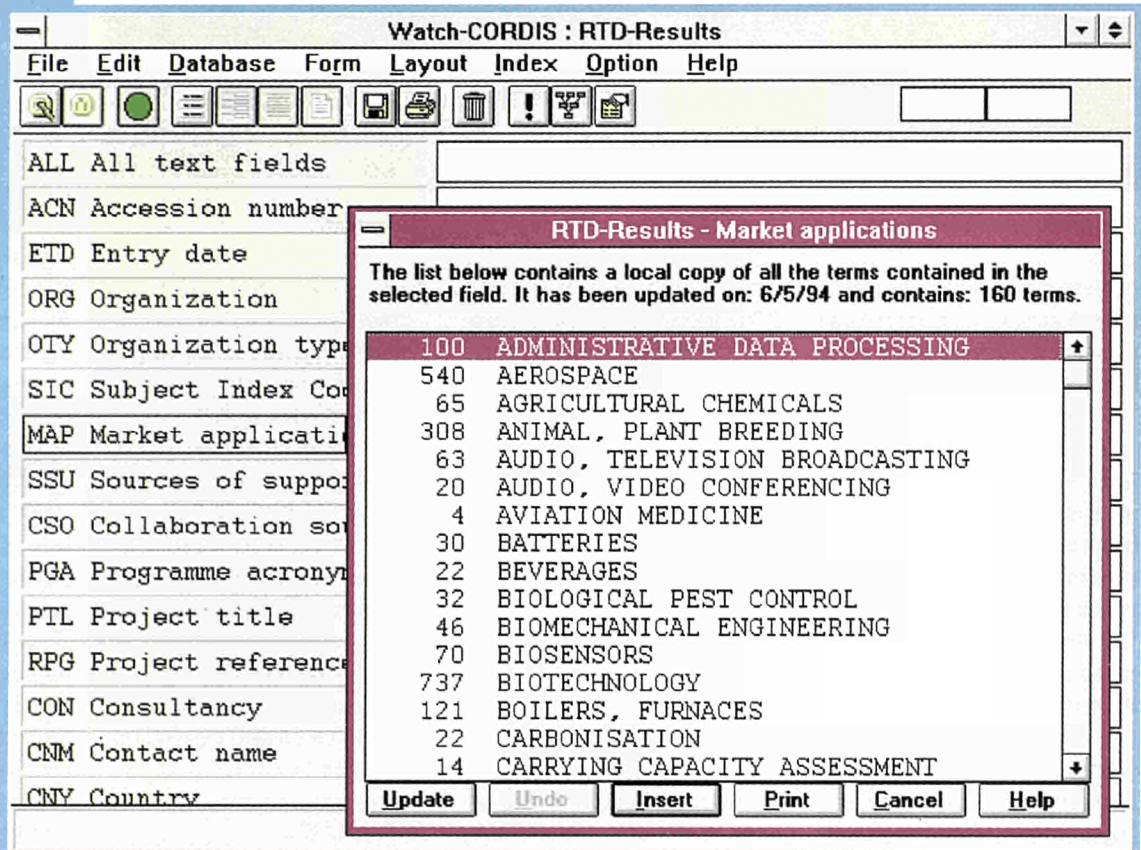
The second phase of the Valorisation project, involving a series of industrial trials and a survey of relevant companies and their requirements, is currently under way. There was a delay, according to Dr McDonnell, due to unanticipated modifications that had to be performed before phase 2 could be completed, but both the trials and the survey are expected to be finished this autumn.

"It's taken us 10 years to turn the original concept into a system for which an industrial partner would want to take out a license," Dr McDonnell concludes. "The EC Programmes played vital roles in this development, with VALUE seamlessly picking up where the RTD Programmes left off. We're optimistic that, as a result, both ourselves and the European materials industry in general will benefit." □

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New CORDIS Products and Services

A new user-friendly interface, a ninth database and an improved reference manual have all appeared in the past few months.



With Watch-CORDIS, a list of recognised search terms is always at hand to make searching easier.

Watch-CORDIS (Windows access to central host - CORDIS) is a new Windows-compatible user interface for CORDIS. It is a significant step forward in bringing the CORDIS service to a wider audience, particularly smaller companies lacking specialised database expertise. To run the programme, you will need:

- an IBM AT (or 100% compatible) PC, with an 80386-based processor or higher;
- at least 4 Mb of RAM;
- a hard disk with at least 4 Mb of space;
- one 3.5 inch disk drive;

- a modem, X.28 or PC/NFS (version 4.0 or higher) connection;
- the MS-DOS operating system (version 3.0 or higher);
- Microsoft Windows (version 3.1 or higher).

Like most Windows applications, Watch-CORDIS offers users both pull-down menus and a number of buttons located on a 'tool-bar'. An extensive Help file is just a mouse-click away.

All database queries are prepared before connecting to the ECHO Host, so communication charges are kept to an absolute minimum. In addition, a list of rel-

evant search terms (such as scientific subject headings, event types, programme acronyms, etc.) can be accessed when building up a query, so users, particularly those unfamiliar with CORDIS, can easily select search terms that the databases recognise.

In addition, once Watch-CORDIS has retrieved the information, the user can customise the way it is displayed. Different information presentation styles can be saved. Apart from the Help file, Watch-CORDIS comes with an extensive user manual. Lastly, of course, the CORDIS Help Desk is a phone call away.

RTD - Contacts Launched

The new CORDIS RTD-Contacts database was launched on May 16, supplying information on people and organisations throughout Europe who can provide information on EU research and technological development.

The database holds information on individuals from the European Commission and other European institutions who are responsible for developing EU policies and managing individual research programmes. The names of national representatives on programme steering committees and the nominated contacts for EU RTD programmes at the national level are

also included.

Other entries include Commission RTD Help desks, programme information points, VALUE Relay Centres, CORDIS Correspondents, IMPACT national awareness partners, EURO INFO Centres, SPRINT network members and the national contacts for non-EU initiatives such as EUREKA, COST and the European Space Agency.

CORDIS Reference Manual

A new version of the CORDIS Reference Manual is now available free to registered CORDIS users. It is in a loose-leaf format, allowing it to be easily updated

as services are upgraded and new products are introduced.

The manual deals in detail with each of the CORDIS Databases and the various database interrogation systems (from the menu system to the CD-ROM). It also contains other information necessary for users, such as the codes used in CORDIS databases, a glossary and other supplementary information.

The sections dealing with the interrogation systems follow a broadly similar pattern, starting with introductory material and a description of the technical features, followed by operating information and a number of search examples.

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Guide, issue 1/94.

► INTERFACES II & III

Entering the Main Phase

The Interfaces of VALUE have completed their initial diagnostic phase and are launching new activities as part of the main implementation stage.

The research/scientific community interface (Interface II) and research/society interface (Interface III) were added to the VALUE Programme in 1992.

Interface II projects have been termed 'research on research', as they aim to stimulate and channel interdisciplinary reflection on the various factors (institutional, legal, socio-cultural, etc.) which influence the performance and exploitation of R&D. Interface III projects, on the other hand, assess the social impact of new scientific and technological knowledge, improve the communication of science to the public and analyse the public's demands and requirements from science and technology.

During the initial phase, a number of studies were launched to assess the worldwide 'state of the art' in the field and to develop ideas for main pilot phase activities. Recommendations from these studies suggest several pilot initiatives, in-

cluding creating a network of organisations (National Focal Points) actively engaged in the field, organising awareness seminars for opinion makers and other groups and helping relevant organisations expand their activities or launch new ones in the field.

Apart from activities following up on the conclusions of the first diagnostic phase, the VALUE Programme recently selected 19 new pilot actions and studies. They cover all topics of both Interfaces, with an emphasis on:

- new communication and awareness activities;
- analyses of public demand and the management and economics of research.

Bridging the Science-Society Gap

In addition, the first Awareness Scenario Workshops have been held over the past few months

across Europe. These represent the first trial of an experimental methodology designed to improve both society's influence on the course of RTD development and the research community's understanding of society's demands.

The methodology works by bringing together local residents, businesses and authorities with members of the scientific and political community in a two-day workshop to debate the pros and cons of a variety of technologies in terms of their abilities to solve social and economic problems. The discussions ensure that local needs are addressed, and highlight new job-creation and market opportunities.

The first five workshops were held in the Netherlands, Greece, France, the UK and Luxembourg, and focused on the theme of 'Sustainable Cities'. VALUE will continue to expand the methodology to cover new fields such as health

and safety, transport and information technology. A handbook will be produced to help the organisers.

Upcoming Interface initiatives include Technology Assessment training seminars in July and the major Interfaces conference in November. An information pack, giving a synopsis of 1993 and the work programme for 1994, is now available.

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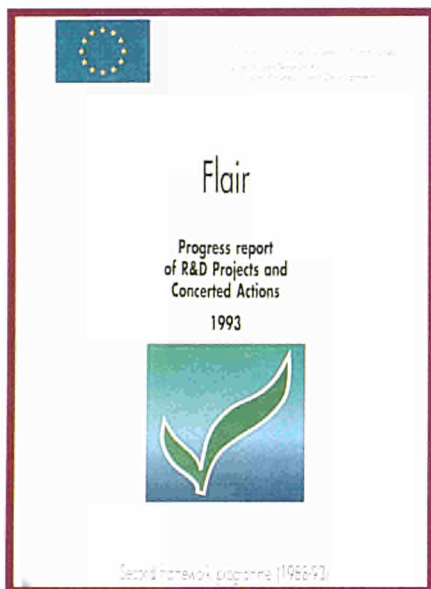
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FLAIR/FLOW: A Model D

While the VALUE Programme disseminates the results of all European research programmes to industry, the individual RTD Programmes also run dissemination activities specific to their research pursuits. FLAIR/FLOW is a unique fusion of the two - a highly successful partnership between the Agriculture & Agro-Industries Programme and VALUE to spread the results of EC food research.



Details of FLAIR projects can be found in 'FLAIR - Progress Report of R&D Projects and Concerted Actions - 1993' (EUR 15246, 31.5 ECU).

The original FLAIR-FLOW project was in fact one of the 33 projects launched under the Specific RTD Programme into Food Science and Technology. This 25 MECU research programme, known as FLAIR, was launched under the Second Framework Programme and ran from 1989 to 1993. The other 32 projects launched within the FLAIR Programme aimed to:

- improve food safety and quality for the consumer;
- promote food industry efficiency and competitiveness;
- reinforce the scientific and technical infrastructures serving the European food industry.

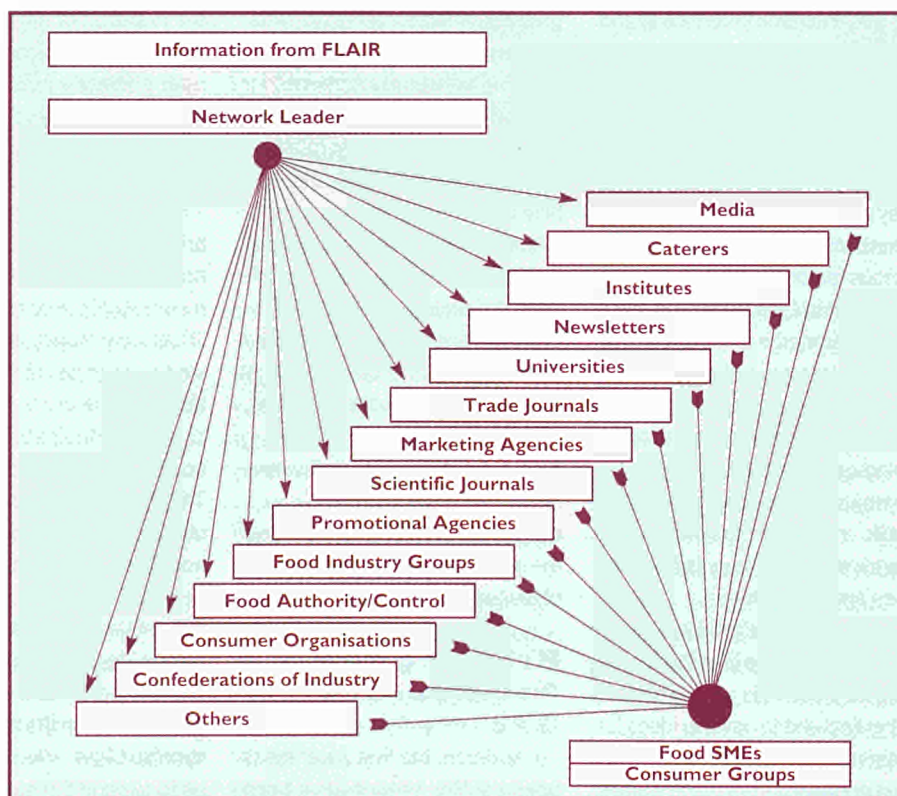
Research activities focused on food quality, food safety and nutrition, and were carried out either through shared cost research projects or concerted ac-

tions. The approach in each case is different: shared cost projects are funded by the Community, to a maximum of 50%, while concerted actions act more as multidisciplinary fora for co-ordination and discussion.

Together, the 33 projects launched under the FLAIR programme (22 shared cost research projects and 11 concerted actions) involved 560 participants from 12 EU countries and 7 EFTA countries. It was the first time food research had been co-ordinated within one programme across Europe.

FLAIR-FLOW: Focused Dissemination

FLAIR-FLOW was Concerted Action 13, the very last project of the original FLAIR Programme. It was launched in 1990 because the participants and European



Each national network leader disseminates information throughout the country.

Dissemination Network

Commission managers involved in the other FLAIR projects realised that the research work had to be disseminated more widely if the benefits were to be felt.

While this is true for all research activities, the FLAIR Programme dealt with a special case - the European food sector. This is an industrial sector rich in small and medium-sized enterprises (SMEs), health professionals and consumer groups. These groups have not traditionally had a great deal to do with the sort of trans-national R&D carried out at the European level, so a special effort was designed to get the research results to them.

Of course, the VALUE programme was set up at around the same time with similar aims. However VALUE is an all-embracing programme, and because of the diverse nature of the European food industry it was recognised that a joint effort between VALUE and the FLAIR Programme would have the greatest effect.

FLAIR-FLOW was conceived and is still run by Dr Ronan Gormley of the National Food Centre of Ireland, and targets information on the results of FLAIR research to SMEs, the media, food industry groups, health professionals, consumer organisations and, ultimately, the consumers themselves. Its scope includes the EU and Austria, Finland, Norway and Sweden.

Ronan Gormley puts particular emphasis on the SMEs. "Although we are in a world of high technology, there is a continuing demand for traditional foods, and with the recent GATT trade negotiations finalised this can translate into significant exports - Europeans, after all, do know a thing or two about food," he comments. "This will bring competition, but small food companies can remain competitive. Although they may need to adopt new technology, this does not mean that they must necessarily sacrifice any degree of quality. But, firstly, they need to know that the technology exists, which means disseminating it widely. We need to ensure that companies on the west coast of Ireland, in Greece and in Portugal all have equal access to the new information and opportunities brought about by EC research."

CASE STUDY:

Controlling micro-organisms in poultry

Demand for poultry meat has increased steadily over the past few decades. This trend is expected to accelerate as the high protein and low cholesterol content of poultry products are increasingly recognised as being important to health. The aim of FLAIR project CA 6, a concerted action coordinated by Dr R. Mulder in Beekbergen in the Netherlands, is to ensure efficient and hygienic poultry production.

The project has three main elements:

- Colonisation control, to prevent the infection of live birds with potentially pathogenic micro-organisms such as *Salmonella*, *Campylobacter* and *Listeria*. "Our research is focused on the origin of infection and the birds' genetic resistance," explains Dr Mulder. "We need to continue the research, in conjunction with industry, to see how this can be made economically viable."

- Production and operational hygiene: since the beginning of this year an EC directive means that all flocks of poultry must be monitored for the existence of salmonella, with each country producing

sampling plans. "The project has not only identified methods of detecting organisms, but has also shown how sampling plans can be developed and introduced with the minimum of disruption," Dr Mulder adds.

- Processed poultry meat production: the project has contributed to the development of new scalding and plucking equipment that operates without a scald tank. "This equipment has been introduced on a world-wide basis," he notes, "and its usage results in a much reduced incidence of cross-contamination of bacteria, often a factor of 10 lower than previous methods."

The project is making a major impact on poultry industries in many countries, and the results have been the topic of a number of specialised workshops organised via FLAIR-FLOW and other initiatives. "We have also received many enquiries for additional information, thanks to the sheets describing our work that FLAIR-FLOW has distributed, so the system appears to be working," Dr Mulder concludes.

National Networks

FLAIR-FLOW operates via national networks in the 16 participating countries (see Contact List, page 14, for addresses). The network serves to disseminate FLAIR results to the target groups in a number of ways.

The most important medium is a series of one-page technical documents. Each of the 103 documents published so far describes one project in straightforward terms, and gives the fax number of the researcher carrying out the research. Paper-based publication was chosen in preference to creating an on-line database as many SMEs and consumer groups in the field have neither the necessary hardware nor the experience - one of FLAIR-FLOW's aims is to keep things as uncomplicated as possible.

The distribution process is equally simple. FLAIR-FLOW sends out the sheets to

the leaders of the 16 national networks. These leading organisations were chosen for their specialised knowledge of the food industry in their own country. They translate the sheets into their national language and pass them on to members of their network, which range from the mainstream media to universities (see Figure p.10). The most active network members, according to Ronan Gormley, are from food inspectorates, consumer organisations, journals and other media. Together, the national leaders reach around 300 network members throughout the 16 countries. Together, these actors have a major multiplying effect - it is estimated that more than 100,000 SMEs and 100 consumer groups in the food industry see this information as a result. And they, of course, pass it on further, resulting in millions of possible contacts throughout Europe. FLAIR-FLOW also mails

●●● almost 5,000 sheets directly to interested organisations.

Network members also present the results of relevant FLAIR projects at a wide range of conferences and trade fairs. And, lastly, FLAIR-FLOW holds targeted workshops in each of the 16 countries where researchers involved in the FLAIR projects present their results.

With its limited budget, one of the problems faced by FLAIR-FLOW is the difficulty of reaching all areas of the participating countries. Although some countries have network members effectively covering all regions, this is not true for all member states. Countries such as Germany suffer when network members try to cover territory as widespread as Hamburg and Munich. Nevertheless, the networks have been very successful. In the first three years, for example, 1400 articles related to FLAIR-FLOW have been published in trade and scientific journals as a result of the technical documents.

Learning Lessons

FLAIR-FLOW continually assesses its operation, with the national network leaders meeting twice a year to review progress and discuss improvements. The following factors have been identified as

critical not just to FLAIR-FLOW's success, but to the success of any similar dissemination network:

- Personnel: network leaders must have expertise, experience and motivation. Individuals already involved in dissemination can add EC research results to their activities at little or no extra cost;
- Information: keep it simple, specific and targeted to the reader's interests, and include a 'profit motive' if possible;
- Information Flow: again, keep it simple. Direct interested parties straight to the researchers, not via any intermediaries, and focus on telephone and fax communications;
- Follow-up: if a reader wants more information, it is of paramount importance that they get it. Ensure that research administrators are prepared to follow up requests for information once the end user's interest has been aroused, and stress the importance of marketing plans;
- Assessment: continually review membership and dissemination procedures - the FLAIR-FLOW networks have tended to shrink over time as some members were discarded due to their lack of involvement. Try to obtain feedback on the network's success so that future strategy changes will respond to real needs and are based on demonstrable facts.

FLAIR-FLOW II: The Future

FLAIR-FLOW terminated in December last year. By that time the Third Framework Programme (1990-1994) was well under way, and the original FLAIR research programme had ceased to exist.

This was because under the Third Framework Programme (1990-1994) FLAIR was integrated together with a number of other, related research programmes to create the Agriculture and Agro-Industry Research Programme (AAIR - see Agriculture: 1987-1998, below). To provide a measure of continuity, however, FLAIR-FLOW kept its name when it successfully applied for funding to continue its work, becoming FLAIR-FLOW II. In addition, Iceland joined the project, bringing the number of participating countries to 17.

However this will not merely be an extension of the original action. To begin with, FLAIR-FLOW II is currently creating SME focus groups, each consisting of 6-10 food companies, within each national network. These focus groups will be asked three key questions:

- Are you receiving sufficient information?
- Is the information of value?
- What is your opinion of the ●●●

Agriculture: 1987-1998

□ **Second Framework Programme (1987-1991):** A plethora of programmes, totalling around 200 MECU, dealt with exploiting biological resources:

- Agro-industrial technologies (ECLAIR);
- Food science and technology (FLAIR);
- Fisheries (FAR);
- Competitiveness of agriculture and management of agricultural resources (CAMAR);
- Forestry Research (FOREST);
- BIOMASS.

□ **Third Framework Programme (1990-1994):** The above programmes were combined to form the 333 MECU Agriculture and Agro-industries (AAIR) Programme, co-managed by DG XII (Science, Research and Development) DG XIV (Fisheries) and DG VI (Agriculture). It has four main Areas:

- Primary Production: adapting primary production to market needs; more envi-

ronmentally friendly production systems; diversification towards traditional and new products; improving socio-economic conditions in rural and coastal areas;

- Inputs in Agriculture: reducing production costs; environmentally and energy-efficient inputs; pest and disease control;
- Processing Biological Raw Materials: new and efficient separation, extraction and conversion processes; processes which increase or preserve the quality of transformed products; improving water management; reducing waste and pollution;
- End Use and Products: defining & satisfying nutritional needs of consumers; food toxicology, hygiene and safety; identifying new, more environmentally-friendly non-food product types; pre-normative research.

□ **Fourth Framework Programme (1994-1998):** Future R&D will be carried

out under the 684 MECU Specific Programme 'Agriculture and Fisheries including Agro-Industry'. It will have the following main priorities:

- integrating production/processing chains, gathering all necessary skills and technologies relating to the use of biological raw materials;
- developing and improving methodologies used in scaling up, designing and testing agro-industrial processes;
- generic food science and advanced technologies to better meet the consumer's needs for a safe, health-promoting diet;
- agriculture, forestry and rural development in support of common policies and to identify solutions for transforming rural areas;
- fisheries and aquaculture.

It is envisaged that the first Call for Proposals under this Programme may be in early 1995.

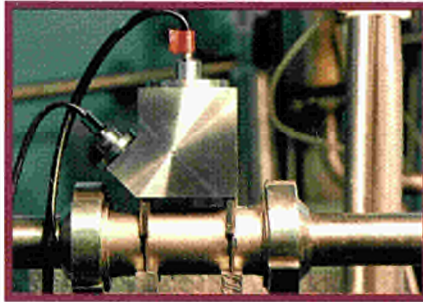
CASE STUDIES

Sanitation of food processing plants

Food processing involves heat, moisture and, of course, food - ideal breeding grounds for bacteria. Ensuring equipment cleanliness is therefore one of the major problems facing food manufacturers today. FLAIR project SC 82 - 'Sanitation of Food Processing Plants' - was established to develop methods of overcoming these obstacles, improving both the safety and maintenance costs of a wide range of food processing plants.

According to Mr Mikkelsen, project co-ordinator of the Biotechnological Institute in Kolding, Denmark, "Our initial objective was to develop sensors for detecting deposits on internal surfaces, as well as an ultrasonic cleaning device. Along with our partners in Denmark, Germany and the United Kingdom, we investigated ultrasonic, optical and vibration-based sensors."

The sensors have now been developed. They are connected to a PC-based process control system, which automati-



Optical sensor mounted in the pilot plant.

cally notifies food processing operators when cleaning is necessary. This is not feasible with today's technology, meaning that operators must clean their equipment on an empirical basis with a sufficient safety margin to avoid the risk of dangerous bacteriological growth. Automating this process will both improve its efficiency and cut costs.

Due to FLAIR-FLOW, the project team has received enquiries from research in-

stitutes and companies all over the world. "As a result, we have sent short technology summaries to organisations in Denmark, Sweden, Germany, England, Ireland, Spain, Greece, Italy, Japan, Australia and the USA," Mr Mikkelsen notes.

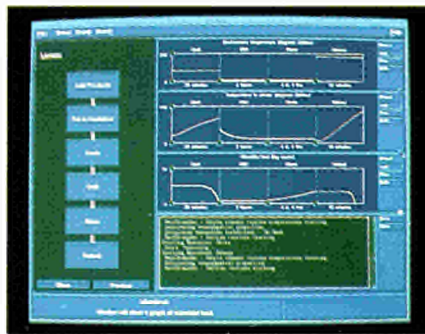
He believes that the advantages of cooperation have proved so great that the participants will try to stay together within the Fourth Framework Programme. "Put simply, the EC's funding was essential to launching the project," he explains. "We are now seeking private companies to act as partners to further develop the technologies and put commercial products on the market, possibly as early as next year. Some of our partners are also commercialising their results. And as our technology can improve processes wherever products are pumped through closed pipe systems, we are not confining our search to the food industries alone."

Software support for food preparation

SC 58 was launched to determine if computer modelling techniques could be applied to food preparation processes. It has resulted in computer software that can improve the quality and safety of products with a limited shelf life.

To use the system, the operator types in the ingredients of a meal and details of the preparation method (container shape, oven type, cooling time, storage, transport, re-heating, etc.). The software then calculates factors such as temperature fluctuations during heating and storage, quality parameters and micro-organic growth throughout the operation.

"The idea is to allow the user to directly see the results of changing parameters, allowing them to experiment on 'virtual food'," explains Dr De Baerdemaeker, project leader at the University of Leuven, Belgium. "We aim to produce an easy-to-use system for those responsible for



Calculating the 'microbial load', for a specific food preparation process (in this case, lasagna) using the software developed in SC 58.

product and process design - a critical step when considering quality control standards such as 4ACCP or ISO 9000. It can also be used to specify process monitoring requirements, and has a large potential for training people in the food processing business. It will have many

other benefits, such as making everyone aware of what happens if they are not working in a clean, hygienic environment."

The current prototype system has already aroused considerable interest from caterers and food consulting companies. "It was initially developed for a UNIX workstation," Dr De Baerdemaeker notes, "but we may also transfer the software to a PC-based platform. It will be also very useful to have a truly portable system that can be demonstrated easily on site."

The university is currently looking for partners to assist in commercialising the software. According to Dr De Baerdemaeker, the FLAIR-FLOW network is already producing results: "We've had enquiries from Germany, Austria, Belgium, Spain, Ireland and Denmark, with most referring to the FLAIR-FLOW leaflets describing our results as the first they had heard of our technology."

●●● various EC research programmes?

This reflects the increased emphasis that FLAIR-FLOW II is placing on receiving direct feedback from the recipients of the research information, particularly potential SME users. The results of this survey will pinpoint many of the requirements of food SMEs and will also help the smaller ones focus on their own particular needs and requirements.

The other major change is that FLAIR-FLOW II is widening its scope to disseminate the results of food-related research from the entire AAIR Programme. For example, the AAIR Programme includes fishery research, so any food-related technology in this area is now eligible for dissemination via the networks.

Another area of increasing importance is nutrition. AAIR projects in this sector are bringing together medical staff and nutritionists in a variety of studies, such as the effect on cardio-vascular diseases of the high fruit and vegetable diet in Southern Europe, the beneficial nutritional properties of olive oil, and so on. There are also plans to create special networks for research into food nutrition and new technologies. It is likely that FLAIR-FLOW II will focus on a different activity each month, with projects being selected from one of the key sectors - safety, nutrition, meat technologies, etc.

Lastly, FLAIR-FLOW II will focus on a growing trend in food technology - advanced engineering. Typical projects range from the potential use of pressure instead of heat in food preparation to improved methods for detecting contamination during food processing. Of particular interest here is that companies not normally associated with food are beginning to contribute their expertise to the food industry, widening the applications of their technology in the process. For example, French companies Thompson Tubes (active in radar applications) and Sofratec (defence manufacturing) are joining forces with the UK's Transfer Technology to develop X-ray technology for the food industry.

These new challenges will keep the FLAIR-FLOW networks busy for another three years. In 1996 the project will come up again for review, and may be expanded or refocused to the needs and priorities of the Fourth Framework Programme. If its current success is any guide, many more research programmes may have adapted their techniques by then. □

Contact List

• FLAIR-FLOW, AAIR and VALUE

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• National Network Leaders

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CASE STUDY: ECLAIR

Improved Wine Production

An ECLAIR project has led to a Danish company developing a unique bacterial culture which simplifies and improves wine production.

Like the FLAIR Programme, the ECLAIR Programme was launched in the 1987-1991 Framework Programme. And like FLAIR, it was incorporated into the current AAIR Programme. As such it is an example of the sort of result which could be disseminated under FLAIR-FLOW II.

Chr. Hansen's Laboratorium A/S, a leading producer of bacterial cultures, and their partners launched the project in April 1990. As project leader Claus Prahll explains, "We have already met all our objectives, and now have a product on the market throughout the world's wine-producing countries. And this from a country where wine is not even made!"

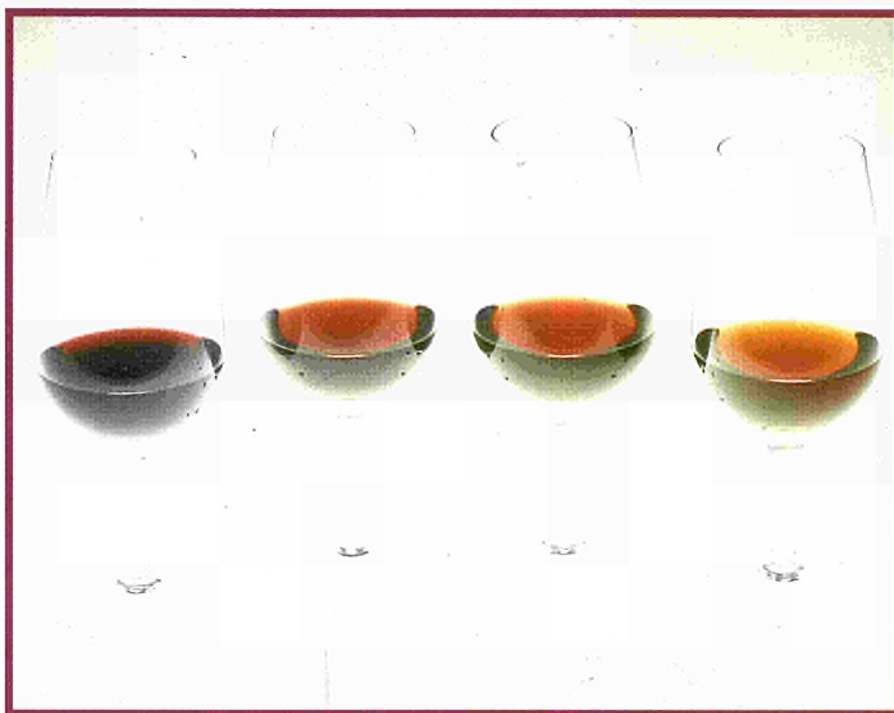
The project involved the Università di Bologna (Italy), the Institut d'Oenologie at the University of Bordeaux II (France) and Portuguese wine institute Estacao Vitivinicola Nacional. The partners aimed to discover a strain of bacteria which could help wine makers better control the production process.

Easy to Transport, Ready to Use

"There are many processes which go into converting simple grape juice into a good bottle of wine," continues Dr. Prahll, "One of them is malolactic fermentation, where the malic acid in the juice is turned into lactic acid. This was the target of our research."

Traditionally, the wine maker awaits the growth of special indigenous bacteria which ideally attain sufficiently high numbers to transform the malic acid just after the alcoholic fermentation.

However the process is often delayed or even impossible, particularly in very acidic wines. Recently, wine makers have been 'inoculating' the young wine with cultures of lactic acid bacteria to start a more controlled fermentation process.



The problem with these readily available industrial preparations is that they cannot survive if added directly to the wine.

"The wine maker must cultivate these bacteria first, a difficult and labour-intensive process which runs the risk of contaminating the wine with undesirable organisms," Dr. Prahll explains. "Our new bacteria can be added directly to the wine, and can be distributed in freeze-dried form, ready to use."

Improved Control, Better Result

The partners first isolated more than 850 bacterial strains, from which five strains were selected for field trials. "Bacteria adapt quickly, and there is always the chance that any useful characteristics could disappear after the strains have been cultivated in an optimal medium," added Dr. Prahll. "Both genetic and physiological factors may be involved, so we had to find a way of stabilising this variability."

Successful trials followed in France, Portugal, Italy and Spain. The end result is *Viniiflora Oenos*, a freeze-dried, super-active bacteria culture. In this form it survives being directly added to wine, allowing wine makers to better control

and simplify production. The bacteria multiply in the wine and quickly transform the malic acid into lactic acid. The control of the malolactic fermentation and the associated gain in time bring obvious advantages to the wine maker. In addition, the security issue is very important - malolactic fermentation with a well-defined selected bacterial strain reduces the risk of contamination with undesirable micro-organisms, and the finished wine will contain a lower level of volatile acidity.

The Danish laboratory had a marketing and commercialisation plan worked out from the beginning of the project, and wasted no time in getting the end product to the market. They are involved in other EC-supported projects as well, and know and recognise both FLAIR-FLOW's and VALUE's role in transmitting research results to industry.

"We've been to Technology Transfer Days at VRCs in Spain and Greece, so the commercialisation of this project is well under way," concludes Dr. Prahll. "However FLAIR-FLOW's dissemination of our results to other scientists would be very useful, so the idea of extending the model to other programmes obviously makes sense."

► CASE STUDY: SPECIFIC PROJECT

Saving a Precious Resource

Technology transferred from the UK via SPRINT is reducing fresh water supply shortages in Greece.

SPRINT IN BRIEF

SPRINT (Strategic Programme for Innovation and Technology transfer) is an EC Programme designed to improve Europe's ability to innovate and transfer technology, both between business sectors and between Europe's different regions. It is an innovative and experimental programme composed of a number of actions and initiatives, and was covered extensively in edition 2/94.

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The water supply system in Larissa, a town in northern Greece, suffered from so many leaks that up to 30% of its fresh water was wasted. Tracking down these leaks is no small task, as typical water supply systems involve kilometres of pipes and thousands of junctions - all underground.

A SPRINT Specific Project (SP 257 - 'Urban Drinking Water Distribution') involved transferring leak detection technology from the UK to Larissa, Thiva (another Greek town) and a suburb in Madrid. The technology is not complex, but does require the accurate mapping of the existing supply system. The system is then divided into leakage control zones, which are closely monitored, narrowing down the location of the major leaks. Instruments are then used to identify their exact location.

An essential part of implementing the technology at these large-scale sites involves giving local

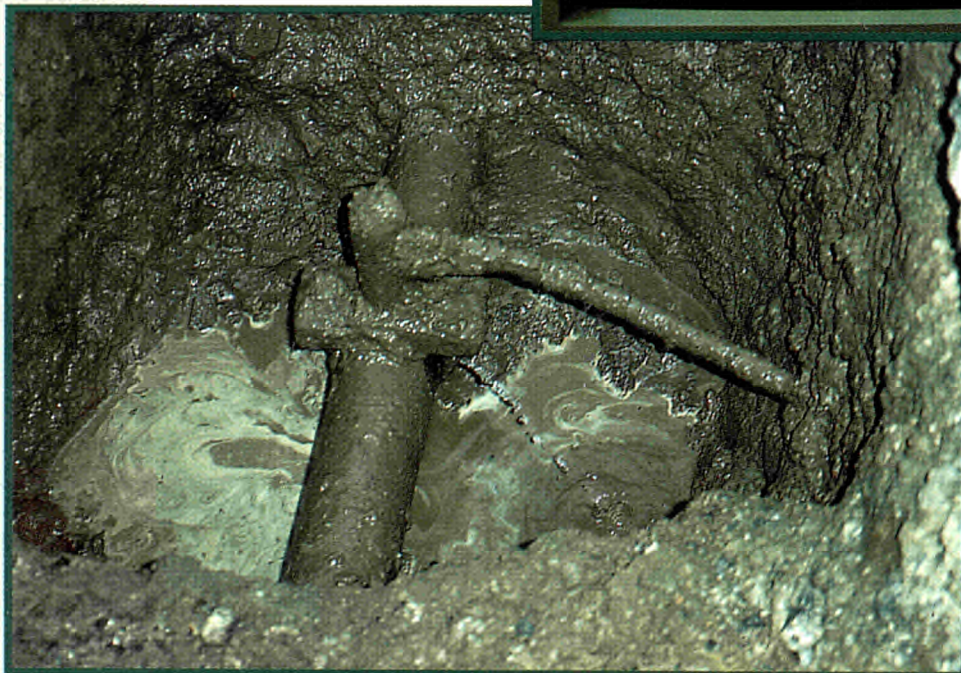
municipal staff in-depth operational training. In Larissa, a number of major leaks and other problems in the supply system have already been detected and repaired.

This success has spurred interest from municipal authorities in other countries - Chemitz in Germany has already joined the project and an extension to Ireland has also been proposed.

There is an active diffusion pro-

gramme planned, involving demonstrations and group visits to the pilot sites. □

Contact
 ■ Guido Haesen,
 DG XIII, Luxembourg.
 ■ Tony Boylan, SPRINT TAU.



Tracking down underground leaks.

Technology Transfer Days

Technology Transfer Days (TTDs) promote transnational technology transfer by bringing together companies located in one particular Member State or region to a number of technology brokers from around Europe. These brokers, who may be from private firms, public authorities or university liaison offices, are briefed well beforehand regarding the companies' needs and resources by the TTD organisers, so they arrive at the 1-2 day event with a dossier of potential partners from their region already prepared.

The first series of 23 TTDs were organised during 1991-92, following a Call for Proposals launched by SPRINT in 1990. They were a success, so a new Call was launched near the end of 1992, resulting in the selection of 23 organ-

Location	Organiser	Month
Dresden (D)	University of Dresden/TII	September 1994
Lyon (F)	ANVAR	September 1994
Salzburg (A)	TECHNOZ	September 1994
Copenhagen (DK)	DTI	October 1994
Liège (B)	SOCRAN BIC/TII	October 1994
Viseu (P)	EMDEME	January 1995
Berlin (D)	T.V.A.	February 1995
To be advised (NL)	I.C.N/TII	March 1995
Bordeaux (F)	ANVAR	March 1995
Bedford (UK)	Technology Exchange	May 1995
Valencia (E)	IMPIVA	June 1995
Lille (F)	ARD Nord Pas de Calais	September 1995
Pamplona (E)	ZABALA/TII	December 1995
Exeter (UK)	Exeter Enterprises	To be advised 1995
Den Haag (NL)	E.G. Liaison	To be advised 1995
Torino (I)	F.A.I. Piemonte	To be advised 1995
Jonkoping (S)	Utvecklingsfonden	To be advised 1995

isations to organise 24 TTDs over the next two years.

These organisations include both

national agencies, such as ANVAR (France), DTI (UK) and Forbairt (Ireland), and regional development

bodies like ARIST Alsace (France), IMPIVA (Spain) and KTTC (UK). The European Association for the Transfer of Technologies, Innovation and Industrial Information (TII), which was launched with the support of the SPRINT Programme 10 years ago (see issue 3/94), is also organising five of these events across Europe, in conjunction with some of its member organisations.

Seven of these TTDs have been held since November 1993, with the most recent one being organised by Infogroup in Athens in June. The dates for the remaining 17 are listed in the table.

C o n t a c t
 ■ Daniel Janssens, DG XIII, Luxembourg
 ■ Bernard Hex, SPRINT TAU

EC Design Prize '94

The European Community Design Prize was awarded to three leading exponents of European design in June.

Good design is an essential element in producing competitive products and services. SPRINT carries out a number of activities to promote the importance of design to European industry, particularly SMEs. One such activity is the European Community Design Prize, organised by SPRINT and design promotion agencies from each of the Member States once every two years.

The Prize goes to three European companies, with a maximum of 2,000 employees, which have shown excellent and innovative use of design as a management tool. The International Jury, composed of designers, industrialists and design promoters, use selection criteria such as product design, graphic communication and environmen-

tal design.

In 1992 there were 41 nominations, with the prizes going to Unicon (Denmark), S.S. Siedle & Söhne (Germany) and Laguiole (France). This year, the national organisations in the 12 Member States nominated a total of 42 companies. At the award ceremony on June 10 at the Netherlands Design Institute in Amsterdam, the Jury awarded the prizes to:

- KOMPAN (Denmark), the largest supplier of outdoor playground equipment in the world;
- LUCE Plan (Italy), who design, produce and distribute light fittings for homes, workplaces, public buildings and architectural sites;
- VITRA (Germany), who manufacturer and market furniture for homes and offices;

The Jury also awarded a Special Mention to Sorefame, a Portuguese manufacturer of rolling stock for railways, and two Honourable Awards to the Hotel New York (where the ceremony was held) and Interieur (Belgium), design promoters who organise bi-annual exhibitions for interior design creativity.

The following day an exhibition displaying all the nominated companies was opened. It will go 'on the road' in September, touring the Member States until the end of 1995. A book presenting the prize, its history and the 1994 winners and nominees will also be published.

Lastly, SPRINT will publish a Design Guide Book later this year, containing information on design organisations, publications, colleges and more throughout Europe.



New rolling stock from Sorefame of Portugal.

C o n t a c t
 ■ Antonio Boronzo, DG XIII
 ■ Daniel Routier, SPRINT TAU

Demonstrating the Future

The HOMESTEAD project brought Dutch company Philips together with a range of consumer suppliers to develop a multimedia home shopping system.

In the 1980s Philips Consumer Electronics teamed up with Japanese companies Sony and Matsushita to develop a common format for consumer-oriented multimedia systems based on compact discs. The result was CD-interactive, or CD-i.

CD-i's great advantage is its ease of use. The CD-i player simply plugs into a TV set, while the user interface is no more complex than a remote control, bringing applications out of the office and into the living room. While many people will initially buy the equipment to play games and watch movies, once the equipment is in the homes the potential for other applications - such as home shopping - is enormous.

"However," notes Tony Scott, of Philips Media UK, "as with any new technology, this potential must be demonstrated. Home shopping companies are not going to replace their paper-based catalogues with CDs without knowing that the system works."

Active User Involvement

For this reason Philips launched the HOMESTEAD (Home Shopping by Television and Disc) ESPRIT project in June 1992, involving several user organisations in the consortium. These included Freemans, one of the largest home shopping catalogue companies in the UK, Page & Moy, a major holiday provider, the British bank Barclays and the Belgian audiovisual company Little Big One.

Barclays and Little Big One received a 'multimedia toolkit' that Philips developed in the initial phase of the project. "The toolkit was designed to allow these companies to put together CD-based



Investigate your finances, buy some clothes or plan your cruise - all from home.

multimedia catalogues for themselves and the other partners," Mr. Scott continues. "The results are staggeringly good and very diverse - you would never guess that the same toolkit was used for all three."

For example, Barclays' financial services CD opens with a film of a man's 50th birthday party, and allows the user to explore the background, financial needs and possible solutions Barclays can offer each person. Freeman's clothes catalogue, on the other hand, shows you their clothes and ac-

cessories in full-motion video, and allows users to either browse through the catalogue or go straight to the section that interests them. And the catalogue from Page & Moy helps users plan their cruise holidays, bringing the holidays to life on the TV screen. Apart from containing all the itinerary and booking details, the package takes the user on a whirlwind tour of the ships from five different cruise companies, effectively bringing an experienced travel operator into the home for as long as necessary.

Extensive Customer Trials

The next stage of the project, currently under way, is one of the largest user trials of its type ever undertaken. 5,500 homes have received the three catalogues, along with a questionnaire designed to gauge their response. Over 300 of these homes had never used CD-i, providing vital information on how the home shopping package can be promoted to non-users.

"We are expecting preliminary results from these studies by the end of July," Mr. Scott notes, "and hope to have final analyses by the time the project is scheduled to end in March next year. In the meantime, we are continuing to develop the next link in the chain - the ordering interface."

Currently, as with traditional paper-based catalogues, home shoppers telephone the company to place their orders. However Philips are planning a final version where the CD-i unit will be connected to the telephone line, enabling orders to be placed at the touch of a button. Philips is currently designing the link, which will probably feature two-way communications, allowing the retailers to inform the customer of special promotions, delays and so on.

"Home shopping is already a huge industry, particularly in the USA," concludes Mr. Scott. "Its future lies in multimedia formats such as CD-i, so this project represents Europe's major bid for a slice of a rapidly growing market."

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▶ ROBOTICS

TELEMAN: Significant Results

A recent evaluation of the TELEMAN Programme emphasises the importance of continuing telerobotic research and development into the Fourth Framework Programme.

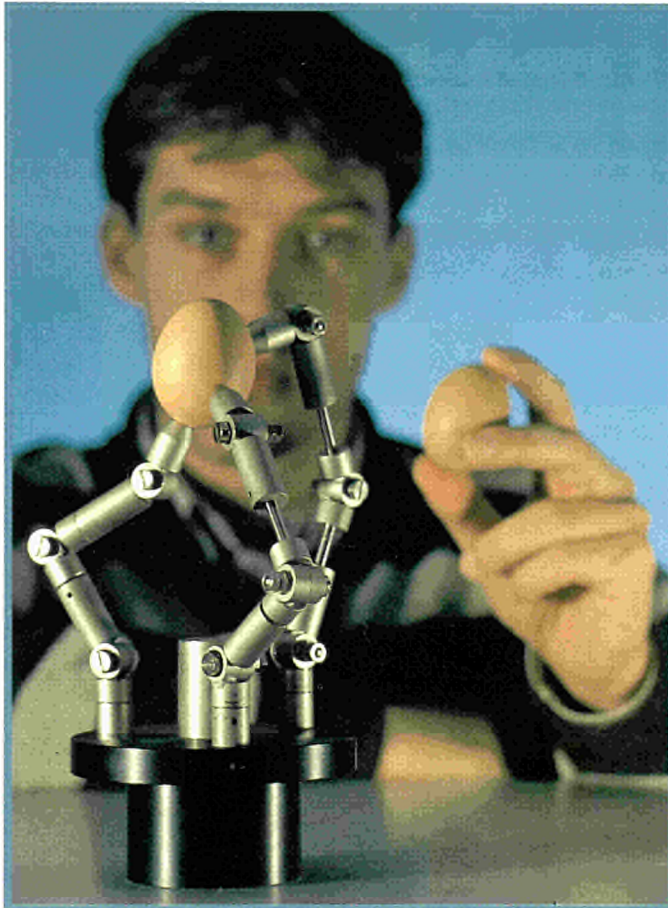
The TELEMAN Programme has been developing remotely operated robots for use in hazardous or disordered nuclear environments since its launch in 1989. That year saw the first Call for Proposals, resulting in 16 projects, with a second round generating five more projects in May 1992.

These five projects, which largely build on and integrate the many technologies developed in the first phase, will be the last. TELEMAN will not continue as a Specific Programme within the Fourth Framework Programme, although advanced robotics will continue to be carried out within other programmes, such as Information Technologies (mainly computer integrated manufacturing and engineering), Industrial Technologies, Nuclear Decommissioning and even Marine Science and Technologies (underwater robotics).

Project Demonstrations and Student Congress

Users of TELEMAN technologies include the builders and operators of fission power plants, fuel reprocessing plants and experimental fusion plants, as well as the emergency response teams set up in France, Germany and (possibly in the future) Eastern Europe. What they all need is a range of advanced, tele-operated robots that can carry out a wide range of tasks with at least partial autonomy in 'nuclear emergency' situations, when the interior of a nuclear plant may be disordered.

TELEMAN projects include these user groups as well as specialised SMEs, university research groups



Gripper: versatile dexterity.

and public research institutes. Many of their projects are being demonstrated in 1994:

■ **SHERPA** went through its 6-legged paces in an Italian nuclear power plant in January. It can bear as much as 300kg over obstacles and up ramps and stairs, and is capable of picking up and carrying a comatose human being to safety. More energy-efficient gaits have been developed to allow it to move independently of its 'umbilical cord' for up to an hour, increasing operational flexibility.

■ **ENEA**, a two-armed remote manipulator system, has been field-

tested at JET (the European fusion laboratory) since 1990, and underwent further trials in May in Rome. Such systems will be essential for tomorrow's fusion reactors, which will be too hot for human operators.

■ **GRIPPER**, a versatile dextrous robot hand, was tested at the University of Delft in the Netherlands in early July. It can be reconfigured for different applications, and will also include an active 'palm'. Input from sensors for touch, slip, force and torque will be fed back to the operator, improving sensitivity and accuracy.

■ **INGRID**, a gantry-based manipulator arm, will be tested this September. The project has successfully integrated a number of technologies developed in TELEMAN's first phase, and is led by British Nuclear Fuels, which is supplying a test facility at their nuclear reprocessing plant in Sellafield (UK).

Next year will see demonstrations of **ROBUG**, a light, low-cost robot capable of climbing up vertical surfaces, and **MESSINA**, a 'train-like' robot capable of tackling staircases and obstacles. This latter design, which involves four 'carriages' linked intelligently together, may one day be capable of carrying the largest payload, including other robots.

Another recent TELEMAN event, the Student Research Projects Congress, is unique to the programme. In 1993 TELEMAN supplied 15 universities across Europe with 20,000 ECU each to allow final year undergraduate or master-level students to carry out small-scale telerobotic research projects. The aim was to complement TELEMAN's user-led focus by funding more speculative academic research into generic problems, in the process establishing greater links between research and education and exposing young scientists to European RTD Programmes.

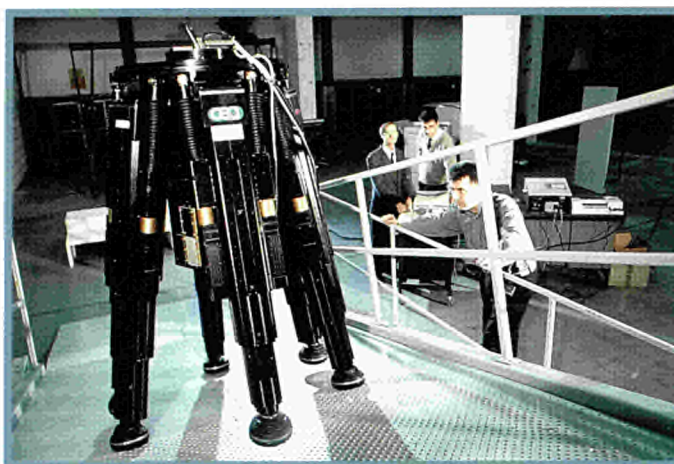
The students presented their projects at the Congress in the Netherlands in late June. Projects included remote 'trickle charging' of a telemanipulator using a laser beam, controlling collaborating robots, radiation resistant force/torque sensors and a master glove input device. ●●●



A Positive Evaluation

The mid-term evaluation, which is expected to be published in full this summer, found TELEMATICS to be a very successful and well managed programme, and that further research into this field at a European level is critical to the future competitiveness of the European nuclear industry. The report strongly recommends that the work begun in TELEMATICS be continued under a new topic - TELEROBOTICS - probably under the new Industrial Technologies Specific Programme, and that the scope be widened to include robots for other hazardous environments, such as in chemical plants, mines, underwater and space.

The programme's success has been partly due to the TELEMATICS Users' Group, which was established to advise on the setting up of the programme and to clarify user needs, ensuring that the research focused on practical and useful telerobotic applications. Al-



Sherpa: 6-legged locomotion.

though the Group will be disbanded with the programme, the European Commission intends to help form the European Telerobotic Users' and Researchers' Group (EUTURG) as a replacement.

The new, self-funded group will widen the previous group's scope beyond telerobotics for just the nuclear industry. It aims to:

- promote and advise on university-based research;
- act as a focal point for informa-

tion exchange;

- identify current and future user needs and applications;
- identify areas in need of manufacturer and industry research;
- liaise with other international organisations in the field, such as the USA Utility/Manufacturer Robotic Users Group.

The sophisticated technologies already developed by the TELEMATICS Programme are ripe for transfer to other industries. Contacts

have begun with the VALUE Programme as well as the dissemination activities within the Specific Programmes, and details of all TELEMATICS projects are available in the CORDIS databases. The new user group should also play a role in translating the programme's achievements to a wider industrial audience, as well as focusing the European research community's attention on this important field. □

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► TELEMATICS

European Nervous System

Over 275 participants from European government, business and research sectors met last March for the 1994 European Nervous System (ENS) Conference.

While all citizens officially have freedom to move and work throughout the EU, there are still important practical barriers in their way. Extra administrative difficulties, for example, can represent a serious disadvantage to those working within Europe but outside of their own countries. It is often difficult for these people to access the social security and health systems of their own countries. Similar administrative barriers obstruct the movement of goods, services and capital.

The 1991-1994 Telematics Programme included an area devoted to overcoming these difficul-

ties through advanced information and communications technologies. Among its objectives is establishing the European Nervous System, or ENS, guidelines for telematics applications that link the administrations of the different Member States and allow local administrations to provide information and services to Europeans wherever they may be in Europe.

Held in Brussels on March 9-10, the ENS Conference 1994 enabled the many researchers, users and policy makers affected by this initiative to trade ideas, experiences and results. Plenary sessions

on the first day covered user requirements, security and legal aspects, open systems and the ENS Handbook STEPS (Solutions for Telematics between European Public Services), prepared by the European Commission and released at the conference.

The 250-page first version of STEPS is designed to help managers implement advanced, administration-oriented telematics applications, and is distributed in loose-leaf format to allow for continual updating. It was written as part of the ENS MENSA project, and included contributions from members of many of the other 13

ENS projects. Each section, from Establishing User Requirements to Financial Management, clearly sets out the problems, issues and possible solutions in implementing these new technologies.

Parallel sessions on the first day covered the application of telematics to sectors ranging from the environment to social benefits. On the second day the parallel sessions were dominated by 13 user forums and 3 workshops. Each user forum was devoted to discussing one of the 13 projects presented at the conference, covering topics such as water traffic control, pan-European computer

search programs and information services, environmental data exchanges, road transport and licensing networks, health care, international mail quality management, organ transplant networks and more. The workshops ad-

dressed generic and sectoral applications in future Framework initiatives and integrating the European Economic Area (EEA) into the Framework Programme.

For the present, work on the ENS is still in the exploratory

stage and options for action are still being identified. Among the key conclusions of the conference was that the research must continue and that the application of new developments should be accelerated. □

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► THERMIE

THERMIE Evaluated

Recent evaluations of the THERMIE Programme confirm its effectiveness as a bridge between energy R&D and the market, and point the way forward for energy technology development and diffusion.

In December last year a report summarising a number of evaluations of the THERMIE Programme was presented to the European Council. The studies included an evaluation and cost/benefit analysis of THERMIE demonstration projects in the fields of energy saving and renewable energy, and evaluations of associated measures, including dissemination activities, and previous European programmes in the field.

The report was produced midway through the THERMIE Programme and found that of the projects with a 'clear result' (well advanced, completed or abandoned), 61% achieved complete success.

However the dissemination of these projects into industry, even accounting for the drop in energy prices in the 1980s, is still well below what could be achieved, particularly in the fields of renewable energy sources and rational use of energy. Recognition of this led to THERMIE's emphasis on breaking down the obstacles new energy technologies face on their way to the market.

Major Environmental Impact

The cost/benefit analysis of THERMIE projects showed that the energy saving and renewable energy projects carried out in the 1990-1992 period saved or substituted 95.2 million toe of energy and



Forty companies exhibited technologies developed in as many projects at the major THERMIE exhibition last year in Brussels.

avoided the emission of 388 million tonnes of CO₂, 2.9 million tonnes of SO₂, 1.25 million tonnes of NO_x, 173,000 tonnes of volatile organic carbons and 938,000 tonnes of CO over their lifetimes. It also predicted that the projects would result in an increase of 588 MECU in Community GDP and a total investment of 2,124 MECU (1992 ECUs) over the 1990-1992 period.

Over 500 associated measures were also evaluated. These turn out to be highly effective ways of helping THERMIE technologies

penetrate the marketplace, for example:

- delegates attending specific THERMIE events gave very high ratings for effectiveness (80%) and availability of new information (87%);

- 25% of the participants had initiated an energy saving project, while 53% said they intended to do so as a result of what they had learnt at the event;

- the OPET (Organisations for the Promotion of Energy Technologies) network proved to be an effective instrument for promoting technol-

ogy throughout the EU and Third Countries;

Taken together, the evaluations show that THERMIE is already a significantly successful programme. Compared with previous programmes, the projects are more commercially successful and involve both greater SME participation (60%) and more transnational collaboration. Although the report was produced at the programme's mid-way mark, THERMIE is likely to make a significant impact on European energy technology. (see also box p.22) □

The THERMIE Programme

THERMIE (1990-1994) is a 700 MECU programme run by DG XVII (Energy) to improve energy efficiency, promote wider use of renewable energy and reduce the environmental impact of conventional energy production methods.

Activities:

- Financial Support for energy technology R&D projects: 426 MECU for 530 projects in 1990-1993;
- Associated Measures to promote the application and market penetration of energy technologies;

■ Coordination of promotional activities with national and other European programmes.

The OPET Network: established to carry out the associated measures, OPET (Organisations for the Promotion of Energy Technologies) is a EU-wide network of more than 40 public and private organisations experienced in the energy sector. They carry out energy studies and audits, market and technology assessments, seminars, training courses, etc.

In the Fourth Framework Programme (1994-1998): THERMIE's technological demonstration activities will be combined with the follow-up to the JOULE Programme (energy R&D) to form the Specific Programme for Clean and Efficient Energy Technologies. The OPET network will continue to be the main tool for dissemination activities.

THERMIE II: the European Commission's proposal, now being considered by the Council of Ministers and the European Parliament, to ensure the continuation of those aspects of

THERMIE not included in the Fourth Framework Programme, such as disseminating information on energy technologies developed outside the EC RTD Programmes.

Contact

- Christine Jenkins, THERMIE Office, Brussels, Tel: +32 2 295 3008 Fax: +32 2 295 0150
- Francoise Bosseler, OPET Central Office, Brussels, Tel: +32 2 771 5370 Fax: +32 2 771 5611

► IMPACT

Information Day & Contact Forum

IMPACT organised an Information Day on May 30 to discuss the issues raised by the European Commission's White Paper on Growth, Competitiveness and Employment (1).

The Information Day immediately preceded the IDT '94 (Information Industries and Markets) Conference and Exhibition in Paris, and aimed to familiarise the players in the growing information industry with developments underway at the European level.

One of the most important of these developments is the White Paper, which specifically highlights the vital role the information industry will play in European competitiveness in the next century. Of particular relevance are the chapters dealing with Trans-European Networks, the Information Society and the Audiovisual Sector.

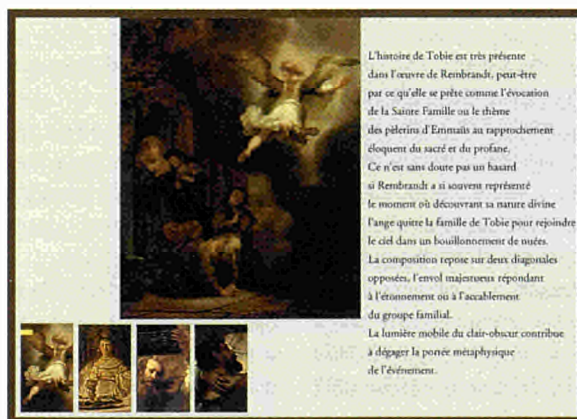
The programme included presentations on the current trends and issues relating to the global information market, the strategic orientation of the European market and the new initiative of 'information engineering', planned for the

Fourth Framework Programme. In addition, a panel of industry contractors involved in EC-supported R&D projects in the area of interactive multimedia and geographical information systems (see Programme Briefing, 2/94) dis-

cussed their experiences with working with other European partners within the IMPACT framework. Their projects, which have resulted in multimedia databases and dictionaries on art and geographical information systems for

education and the real estate market, were demonstrated throughout IDT '94, which took place from May 31 - June 2. Almost 500 people attended the Information Day. Many of these also attended the IMPACT Contact Forum, held the following day to make it easier for individuals and organisations involved in the field to meet potential project partners. There were a total of around 230 such meetings, pre-arranged through the IMPACT Programme. □

(1) The White Paper was covered in *Policy News*, issue 2/94.



Containing around 1000 paintings and drawings from major European museums, 'Flanders, Genesis of European Art' shows how Flemish art influenced 14th-17th century Europe.

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IMPACT Central Office, Luxembourg
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 Fax: +352 4301 32847

RECENT ADVANCES AND FUTURE NEEDS IN THE MICROSCOPY OF MATERIALS 19-25 September 1994, Giens (France)

Sponsored by the European Science Foundation, this major conference will cover all the main forms of microscopy (Transmission and Scanning Electron, Atom Probe Field Ion, Scanning Tunnelling, Atomic Force, etc).

Contact: Dr J. Hendekovic, ESF,

Tel: +33 88 76 71 35; Fax: +33 88 36 69 87.

DECOMMISSIONING OF NUCLEAR INSTALLATIONS

26-30 September, Luxembourg

This international conference will present the results achieved by the completed 1989-1993 EC programme of the same name and provide an opportunity for discussions between experts and scientists both from within and outside the EU.

Topics to be covered include the long-term integrity of buildings and systems, decontamination, dismantling techniques, treating waste materials, remote controlled manipulators, estimating radioactive waste quantities and testing new techniques under real conditions, including four pilot projects.

Contact: FBCL Conference Services, Luxembourg,

Tel: +352 45 55 18; Fax: +352 45 59 05.

MATERIALS FOR ADVANCED POWER ENGINEERING 1994

3-6 October, Liège (Belgium)

Fifth in a series of conferences stretching back to 1978, this conference will include the work of the recently concluded Second Round of the COST 501 project, which has been working on high temperature materials since 1981.

It will cover various developments of these materials for power engineering and related technologies, with the exception of nuclear engineering. Technical Sessions include Steam Power Plants, Gas Turbines, Diesel Engines and Advanced Combustion.

Contact: Mr D. Coutsouradis, CRM

Tel: +32 14 54 62 70; Fax: +32 14 54 64 64.

EUROPEAN INNOVATION CONVENTION

11-12 October, Stuttgart (Germany)

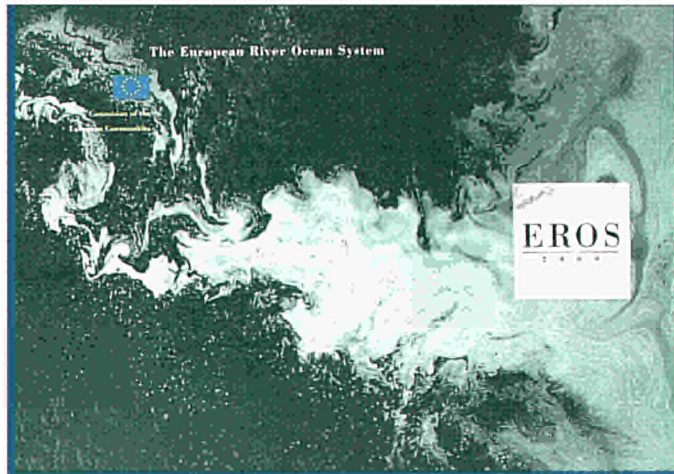
Sponsored by the EC's VALUE and INTERPRISE Programmes, the Convention aims to present innovative environmental technologies developed within the EC's RTD Programmes to technology-oriented SMEs, as well as promote technology transfer between these companies. It is suitable for companies seeking to solve their environmental problems, production companies looking for new products to suit environmentally-oriented demands and research organisations interested in applying for EC or regional research funding. There will be four workshops, covering environmental technologies in the metal production, plastics and textile/paper industries and industrial emissions screening. A range of technology transfer services will also be organised.

Contact: Gesellschaft für Internationale Wirtschaftliche Zusammenarbeit,
Fax: +49 711 227 87 22.

THE FUNCTIONING OF THE MEDITERRANEAN

18-22 October 1994, Palma de Mallorca (Spain)

Co-organised by the Environment and the Marine Science and Technology (MAST) Programmes, the conference will present the results of six years of multidisciplinary research under the long-term EROS 2000 (Eu-



ropean River Ocean System) research project. EROS 2000, supported by both programmes, is studying the bio-geochemical cycles and their alteration by human intervention in the coastal areas of Europe.

Contact: H. Barth, Environment Programme, DG XII, Brussels,

Tel: +32 2 295 64 52; Fax: +32 2 296 30 24

COMBINED ENERGY AND WATER MANAGEMENT IN INDUSTRY

24-25 October, Thessaloniki (Greece)

Organised with the collaboration of the JOULE Programme, this EURO-THERM Seminar focuses on the efficient industrial use of water and energy. Topics include optimised system modelling and design, energy efficient desalination and waste water purification, energy and water auditing and more.

Contact: Prof. A. J. Karabelas, Aristotle University of Thessaloniki,

Tel: +30 31 996 201; Fax: +30 31 996 209.

LEGAL ASPECTS OF MULTIMEDIA AND GIS

27-28 October, 1994, Lisbon (Portugal)

There will be demonstrations of EC-funded multimedia and Geographical Information System (GIS) projects, presentations of studies commissioned by the EC on the law relating to copyright and electronic delivery in Europe, a round table of operators in the multimedia industry, a discussion session on legal issues and a panel discussion on 'citizens' rights in a multimedia society. Simultaneous translation will be provided in English and French.

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Email: r.swetenham@mhsg.cec.rtt.be

R&D ON INDUSTRIAL AND MATERIALS TECHNOLOGIES

6-8 December 1994, Brussels (Belgium)

The 5th in a series of annual conferences covering the EC's research programmes in this field, the conference focuses on the results obtained under the 3rd Framework Programme. The preliminary programme is now available. Future editions of Innovation & Technology Transfer will provide more details.

Contact: E.C.C.O.

Tel: +32 2 647 87 80; Fax: +32 2 640 66 97.

EUROPEAN WORKSHOPS ON ECO PRODUCTS

19-20 January 1995, Dublin (Ireland)

Organised by the European Foundation for the Improvement of Living and Working Conditions, this conference will present the results of several of the Foundation's projects into developing new policies, methodologies and practical tools for a more sustainable future.

The workshops will include industrial and graphic designers, representatives of the European Commission and Parliament, employers' organisations, trade unions and governments.

Contact: Ms. L. Mastenbroek

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• **CORDIS**

■ **RTD-Results**

The second edition of RTD-Results has been recently published. The 36-page brochure contains details of over 120 technological results. All have been downloaded from the CORDIS RTD-Results database, and all have a positive entry in the CSO ('Collaboration Sought') field.

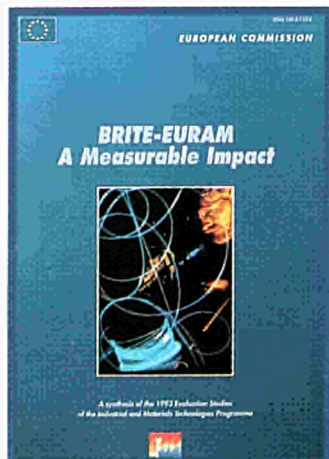
It reflects the way that the RTD-Results database has been expanded to improve coverage of technologies suitable for transfer to industry. New sources recently added, for example, include German Chambers of Commerce, technology transfer agencies from around Europe and the European Space Agency. Details of technologies developed outside the European research programmes, and outside the EU itself, are increasingly common - in fact a significant proportion of the results in the current publication stem from non-EC research.

• **INNOVATION**

■ **Sectoral Catalogue: Innovation and Technology Transfer**
EUR 14778 EN

The latest in the VALUE Programme's catalogues of EC R&D Publications, this 24 page brochure introduces the VALUE and SPRINT Programmes and includes details of regular and one-off publications from both, including the CORDIS Database service.

• **INDUSTRIAL AND MATERIALS TECHNOLOGIES**



■ **BRITE-EURAM: A Measurable Impact**
EUR 15276, 7 ECU

This 32 page report synthesises and presents the conclusions of two major evaluations of the BRITE, EURAM and BRITE-EURAM research programmes. Being carried out using different methods and covering different projects, the two evaluations were complementary, yet came to quite similar, positive conclusions regarding the programmes' scientific, technical, economic and other impacts.

• **SPRINT**

■ **EACRO European Technology Directory**
Sponsored by the SPRINT Programme, the EACRO (European Association of Contract Research Organisations) has produced a 300+ page directory of

its 50 member organisations. The bulk of the directory is taken up by brief descriptions of each of the various members, including their activities, research fields and contact numbers. A 16 page index allows companies looking for research assistance to swiftly find the contract research organisation(s) matching their requirements.

Contact: EACRO Secretariat
Tel: +33 1 34 81 85 81;
Fax: +33 1 30 54 04 14.

• **ENVIRONMENT**

■ **The Greening of Eastern Europe**
6,000 BF (approx.150 ECU)

This conference, subtitled 'Policy Issues and Business Opportunities', was organised by Forum Europe last April in Brussels, supported by the European Commission (DG XI) and Kraft Jacobs Suchard. Two documents resulted: a Background Report and a Summary of Debates. The 66-page Background Report was written by the European editor of New Scientist magazine. It introduces the problems, analyses the business angles, summarises the EC's PHARE Programme and outlines the environmental problems along the Danube Basin and in Bulgaria, the Czech Republic, Slovakia, Hungary, Poland, Romania and Slovenia. The 21-page Summary of Debates covers the discussions held during the conference itself.

Contact: Forum Europe,
Tel: +32 2 736 14 30;
Fax: +32 2 736 32 16.

NOTE

If specific contact information for obtaining a publication is not supplied, refer to the 'Quick Reference Guide' (ITT issue 1/94). Publications are free unless otherwise stated.

• **BIOTECHNOLOGY**

■ **Proceedings: Intellectual Property in Genome Mapping Projects**
EUR 15338, 7 ECU.

The workshop was held in Munich immediately after the EPO-SIUM ('Genetic Engineering: The New Challenge', organised by the European Patent Office) in November 1992. It brought together leading scientists and legal experts to exchange views and learn from each other. Members attended explicitly in a personal capacity, and were therefore able to talk without any organisational or professional constraints.

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