

RTDinfo

Magazine on European Research

45 | May 2005



European Commission

ISSN 1023-9006

European textiles Saved by research?

Interview
Janez Potočnik,
European Commissioner responsible
for science and research 3

Enlargement
Spotlight on Cyprus and Malta 16

Editorial

Contrary to the well-known saying, history does quite often repeat itself. Surely research today is a case in point, as Europe as a whole is apparently rediscovering its importance? Apart from this new European paradox, sociologists will see this as a perfectly normal development: by living continually in the presence of science we have come to lose sight of it; by encountering technology wherever we turn we have almost come to forget about it. Swept along by progress, our awareness of it has become dulled. It is time to wake up!

Reawakening or rebirth?

European research currently has the wind in its sails. Aided by favourable political trends, it is taking up a position as a major area of EU policy. Perhaps this is simply the natural culmination of a historical trend, during which research has accompanied and even stimulated each key stage in European integration (ECSC, Euratom, EEC, enlargement). But it is an accelerating trend. After the European Research Area (2000) and the "3% objective" (2001), research has now been identified as a major pillar in the "triangle of knowledge" (Lisbon). Logically, this has caused the Commission to propose a doubling of the Union research budget from 2007 (see pages 3-6). The draft Constitution,

currently at the heart of intense political debate, also places considerable stress on research (see page 22).

So is it a reawakening or rebirth? Following or due to the "dematerialisation" of the economy, in these early years of the 21st century it is knowledge that is becoming the raw material for European industry. Research, education and innovation are the foundations of our future competitiveness. The textile dossier in this issue (page 7) is just one of many illustrations of this. Central to our long tradition of science and technology, knowledge and know-how are Europe's strengths. They must now become its wealth, too.

FEATURES

Textile industry

Europe has always been a key player in textile innovation. Over the past 20 years, however, the sector has been steadily eroded in the face of increasingly able competitors. 2005 was a turning point, marked by the total liberalisation of the textile industry at global level under the Uruguay Round. As a result, Europe is now looking to its strengths and banking on intelligence.

7 Textiles: past, present, future

8 Tailoring EU textiles to meet global competition

10 Crusader for innovation

Interview with Paul Kiekens of the Ghent University Textile Laboratory (BE)

11 The synthetic past

12 Re-tailoring knowledge

14 Inwoven intelligence



Interview

3 The logic of the 'leap forward'

In proposing to double the EU resources allocated to the Seventh Framework Programme, the Commission is seeking to give Europe the means to act on the Lisbon Strategy to place Europe at the heart of the knowledge economy. Interview with Janez Potočník, European Commissioner responsible for science and research.



EU Research Policy

6 Profile of the Seventh Framework Programme

The structure, strengths and priorities of the 2007-2013 Framework Programme.

Enlargement

16 Cyprus – Eastern outpost of the European Research Area

Cypriot research is a recent phenomenon – the University of Lefkosia was only founded in 1992 but is driven by youthful enthusiasm and is focused on innovative fields. The island also has a centre of agricultural excellence, the ARI, whose reputation has spread to a number of continents.



18 Malta – Birth of Europe-backed research



Malta, population 400 000, is almost virgin territory when it comes to research – which is potentially the greatest asset of this European newcomer.

20 In brief

Science within arm's reach, news in brief, publications, diary, table of calls.

Portrait

30 Out of Africa

"The links between ecology, the economy and development are clear," explains Charles Perrings, Professor at the University of York (UK) who owes his awareness of the environment to his African childhood. RTD info meets a tenacious and committed researcher for whom global and local demands are inseparable, requiring an analysis that takes this dual dimension into account.



Health risk

32 Campylobacteria under the microscope

Despite being the cause of many food infections, little is known about campylobacteria. A partnership of European, American and South African researchers is now studying this microbial family to assess their potentially infectious impact.



Astronomy

34 When distant worlds meet

A close look at the topics of discussion at this year's JENAM (Joint European and National Astronomy Meeting), to be held in Liège (BE) in July. A meeting that pulls in the experts while also offering something for the general public.



Society

36 Coping with life on the outside

The partners in the MIP (Women, Integration after Prison) project sought to identify, in six European countries, the conditions experienced by women in prison and the reintegration policies designed to help them. A mixed and often far-from-rosy picture emerged.



Science and society

40 Researchers take centre stage

Throughout the summer, the Researchers in Europe initiative will be seeking to lift the veil on the work of scientists and bring together the experts and the general public. A range of events will be organised, with the same aim but different styles.



Notice

Neither the European Commission, nor any person acting on its behalf, may be held responsible for the use to which information contained in this publication may be put, or for any errors which, despite careful preparation and checking, may appear.

© European Communities, 2005

Non-commercial reproduction authorised, subject to acknowledgement of source.

A magazine providing information on European research, RTD info is published in English, French and German by the Information and Communication Unit of the European Commission's Research DG.

Editor in chief: Michel Claessens

Tel.: +32 2 295 9971

Fax: +32 2 295 8220

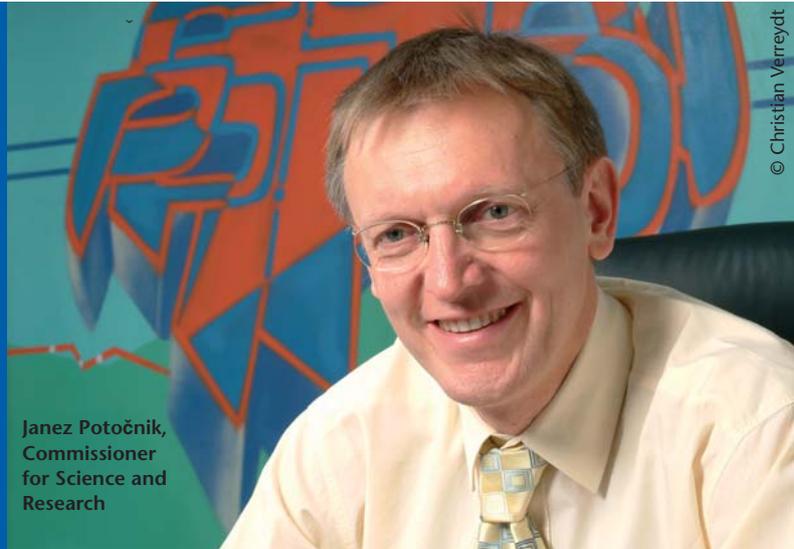
E-mail: research@cec.eu.int

84 000 copies of this issue were published.

All issues of RTD info can be consulted on-line at the Research DG's website: europa.eu.int/comm/research

The *LOGIC* of the 'LEAP FORWARD'

European research is on the eve of an unprecedented shift. In announcing, in 2004, its proposal to double EU funds allocated to research under the Seventh Framework Programme, the European Commission spectacularly thrust to centre stage the key priority of the Lisbon Strategy: to root renewed European growth and competitiveness in a knowledge-based economy. RTD info meets the new Commissioner responsible for science and research, Janez Potočnik, now one of the driving forces behind this 'leap forward'.



Janez Potočnik,
Commissioner
for Science and
Research

© Christian Verreydt

■ *In doubling the Community research budget – which now ranks third, behind agriculture and the Structural Funds – the Commission is surely proposing a significant adjustment to the hierarchy of Union policy?*

Janez Potočnik – To avoid misunderstanding, this announcement of a doubling of research funds needs to be stated in the clearest terms. I prefer to talk about absolute numbers, rather than increases. The Commission proposal was made in the context of the financial perspectives presented in 2004. These were formulated as part of the traditional seven-year cycle of decision-making that applies to all the Union's policies – in this case, for the years 2007 to 2013. There has always been a discrepancy between this global seven-year budgeting cycle and the five-year Framework Programmes. This is illogical and does not aid transparent accounting. In economics and politics, as in science, the choice of the units of measurement is more than a detail, especially if you want to compare the respective weight given to actions and policies.

From the Seventh Framework Programme onwards, we propose to synchronise these cycles by extending research budgets from five to seven years. The present average for Union research expenditure is €5 billion a year. The doubling the Commission requested would mean allocating €10 billion a year to research between 2007 and 2013 – equivalent to a total budget of €70 billion for this period. That is the measurable ambition that is proposed at the outset.

But this 'quantum leap' must be put into perspective. In the United States, 95% of public research investment is in one way or another under federal control, whereas in the European Union the present Community Framework Programme represents scarcely 5% of total public expenditure in this sector. That is the nature of our European model. Distinctively, it consists of a mosaic of national research policies. Doubling the European

budget does not call this model into question but will, we believe, help to improve synergies and eliminate duplication of national efforts.

■ *Nevertheless, how do you justify an increase on such a scale?*

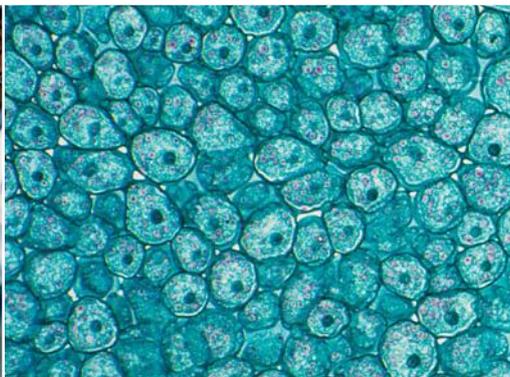
The most essential argument is simply that we have no other option. Over the past five years, Europe has adopted the direction set by the Lisbon Strategy, which has been affirmed and reaffirmed by successive European Councils. This means that all the Member States are firmly behind it. The objective is to maintain and strengthen our continent's prosperity while, at the same time, safeguarding the social, economic and cultural models and lifestyles to which we are attached. To achieve this ambition, the Union has set itself the challenge for the future of becoming one of the world's key centres of knowledge creation. The response is therefore one of simple logic: the whole Lisbon Strategy loses its credibility if we fail to give European research the resources with which to create this economy and knowledge society.

■ *What is the present feeling among the Member States about the financial expression of this 'logic of credibility'?*

As I have just said, the consensus on the Lisbon objective is deeper than ever. It relates not just to science and technology but to the 'knowledge triangle' – that is, the close synergy that must be created between research policy, innovation policy (which includes support for the development of fields such as risk capital and intellectual property rights), and education policy.

But the 'moment of truth' has yet to come. What is finally decided for the Seventh Framework Programme depends on the global negotiations, which are now beginning, on the way in which the Lisbon Strategy will be translated in terms of the total resources allocated to Union

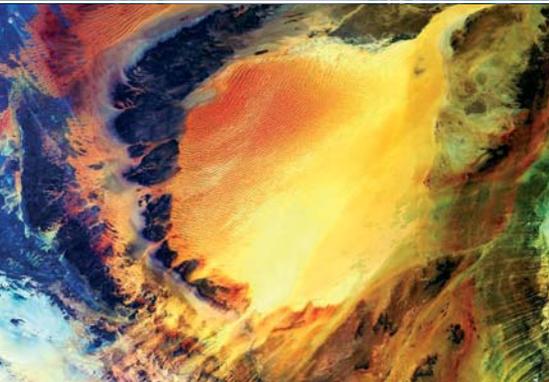




©ESA



©ESA



Health, biotechnology, food, agriculture, the information society, the nanosciences, materials, industrial technologies, energy, the environment, transport, socio-economic research, space and security are all included under the Seventh Framework Programme's Co-operation Programme.

policy for the 2007-2013 period. There are a number of financial considerations at stake in these negotiations. One is the not insignificant matter of the economic and social cohesion of a Union that now includes ten new Member States. This is because major imbalances in economic development, industrial competitiveness and research capacities from one country to another clearly remain.

However, I want to emphasise that research policy has a very specific characteristic that sets it apart from the other aims of the Lisbon Strategy. I am talking about the need for it to be firmly based on competition through excellence. Science and technology are fields in which the objectives of 'redistribution' and of 'just reward' are truly inappropriate. Research funding must be an incentive that pushes candidates to become top level, not a bottomless pit of money to be squandered. If they are not allocated to those who know how to put them to the best possible use, these resources will serve neither science, nor Europe, nor even the country in which they are used.

Of course, new Member States or specific disadvantaged regions can and should be helped to equip themselves for successful competition. But this kind of support must not be confused with research policy. When it comes to excellence, a comparison comes to mind when I think of the state of football in my own country. Have you ever heard of a Slovenian team participating in the Champions League? No. No doubt there are second-grade tournaments in which we could participate. But, as a Slovenian, I can say that the mark of excellence will only really be conferred the day one

of our teams meets Manchester United in a packed Ljubljana stadium.

■ *To turn to the subject of the Framework Programme content, what specific new research needs will be taken into account?*

The first need is not strictly speaking 'new'. It is justified by the fact that European programmes act as a catalyst, as is increasingly evident from the number of replies to calls for proposals. Unfortunately, under the present limits to the Union's resources, the phenomenon of over-subscription – the need to reject research projects that are excellent in every respect – is becoming an endemic problem that discourages excellence as much as supporting it! Take the Marie Curie actions for the mobility of researchers, for example. Here, 50% of proposals evaluated following calls meet the stated criteria, but the budget restraints mean we can only approve 10%. This is a frustrating situation that penalises a growing number of dynamic research players in the Union. In saying this I am, of course, thinking especially of SMEs which are a particularly essential target of European innovation policy.

Another important novelty is the creation of the European Research Council – a body that will give scientists the 'free and autonomous' means to explore pioneering zones of discovery, the financing of which will be an inherent part of the Seventh Framework Programme's budget. Work in this area has now formally begun with members of the scientific community.

Another need stems from the increasingly sophisticated, complex and costly tools that



science and technology need to be able to develop what is commonly known as 'research infrastructures'. It is now generally agreed that some of these are only really of any use if they are developed and supported throughout the European Research Area, with allocations included in the Framework Programme.

The Sixth Framework Programme also opened up the very important strategic field of increased coordination between the national research centres of Member States, with the ERA-NET⁽¹⁾ programme. The pilot stage of this is now complete and we hope the Union will be able to grant increasing support to implementing this fundamental co-operation that must become one of the cornerstones of the European Research Area.

Finally, the relatively recent creation of 'Technology Platforms' has opened up a vast field of new possibilities for European research policy. These platforms bring together industrial, scientific, financial and political decision-makers from a whole series of sectors. With the focus firmly on increasing the industrial competitiveness of knowledge developments, their aim is to define medium- and long-term priorities for the development of strategic innovations and the research needed to achieve this. I believe that these platforms must play a key role in setting the new and better-targeted objectives of the Seventh Framework Programme.

■ ***Does this mean that the present major themes are going to be overturned?***

No, on the contrary – we want to ensure continuity for the priorities that form the fabric of the present, very successful Sixth Framework Programme. These have brought a fundamental switch to those research subjects that are most important to the knowledge society. But in a scientific and technological landscape that is evolving with increasing speed, European research policy must have an increased ability to evaluate, react and adapt. This is why the work programmes for the calls for proposals will be largely defined by the recommendations drawn up within the Technology Platforms.

■ ***A frequent criticism of the Union's research actions in this field is inflexibility in the choice of support instruments that accompany these calls for proposals.***

That is another aspect that we must correct. Today, we have a whole array of instruments adapted to a wide range of possible support measures.

We must be much more flexible in managing these instruments and allow greater freedom of choice for the research players.

■ ***You speak of management, but there are also recurring and insistent complaints about the bureaucracy that burdens the procedures. Obtaining Community support is often described as an increasingly demanding and discouraging 'obstacle course'.***

I am aware of this criticism, which is well-founded. I am determined to get to grips with this issue of management and simplification of administrative procedures. The Commission really must review its approach in this field. The request for a doubling of resources makes this all the more pertinent. We must invent a new method of management for the way we make our evaluations, conclude contracts, organise financial follow-up, and so on. Large areas of these tasks require professional expertise that is beyond the competence of a public administration. Before anything else, the Commission's basic mission is to guarantee the rigorous use of public money. Transferring certain logistics and administrative tasks to an executive agency – such as management of the Marie-Curie actions, support for infrastructures, or assistance to SMEs – would seem to be one of the options that must now be taken up.

(1) European Research Area-Network

Profile of the *Seventh* Framework Programme

“Building the European Research Area of knowledge for growth”. This central theme is inspired directly by the stated desire to make the ‘Lisbon Strategy’ a success and to set out the ‘growth triangle’ formed by research, education and innovation policy. The Commission’s proposal to establish the Seventh Framework Programme has been before the Council and European Parliament for examination since the beginning of April 2005.

To trigger growth and competitiveness, characterised by a strengthened Europe of knowledge and commitment to the excellence needed to achieve this: that is the primary inspiration behind the new Framework Programme. It is built on five core priorities:

- to resolutely support research able to create industrial applications and establish Europe as a key player in a global and sustainable economy;
- to give a new Europe-wide impetus to ‘pioneering’ scientific research as a source of future innovation (priority expressed by the creation of the European Research Council – ERC);
- to help the research world recruit human resources attaining a higher standard and to equip it with the most effective common tools and infrastructure possible;
- to strengthen coordination between research efforts at national and regional level;
- to simplify and render more efficient the operating methods of the Framework Programme and the procedures for participating in it.

These ambitions will be realised by means of a Framework Programme consisting of four major sub-programmes:

CO-OPERATION – This will cover all support for research or coordination projects under the nine scientific and technological priorities. The programme includes Euratom research (nuclear fission and protection and the ITER international programme on nuclear fusion).

IDEAS – This programme is dedicated to the new dimension of ‘pioneering research’ (support for the ERC).

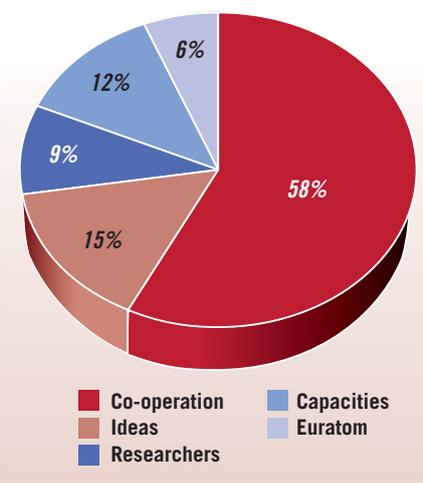
RESEARCHERS – Going from strength to strength with each successive programme, this component concerns the continuation of and building on present and future Marie Curie mobility actions, as well as efforts to improve conditions for carrying out research occupations.

CAPACITIES – This covers:

- support for research infrastructures;
- specific actions in favour of SMEs;
- efforts by the regions and for convergence in the quest for excellence throughout the Union;
- support for highlighting the role of ‘science in society’ and its perception by the general public;

Proposed breakdown between the principal FP7 programmes

(On the basis of a global budget of €68.5 billion for the 2007-2013 period)



- the development of scientific co-operation and international technologies (a theme that will also be incorporated in all the aforementioned research actions).

The changes brought to the Seventh Framework Programme are very much in keeping with the spirit of its predecessor in terms of priority research subjects. There is also a desire for continuity in the forms of support, the so-called ‘instruments’. At the call for proposals stage, however, the choice will be rendered less pre-determined and thus more flexible.

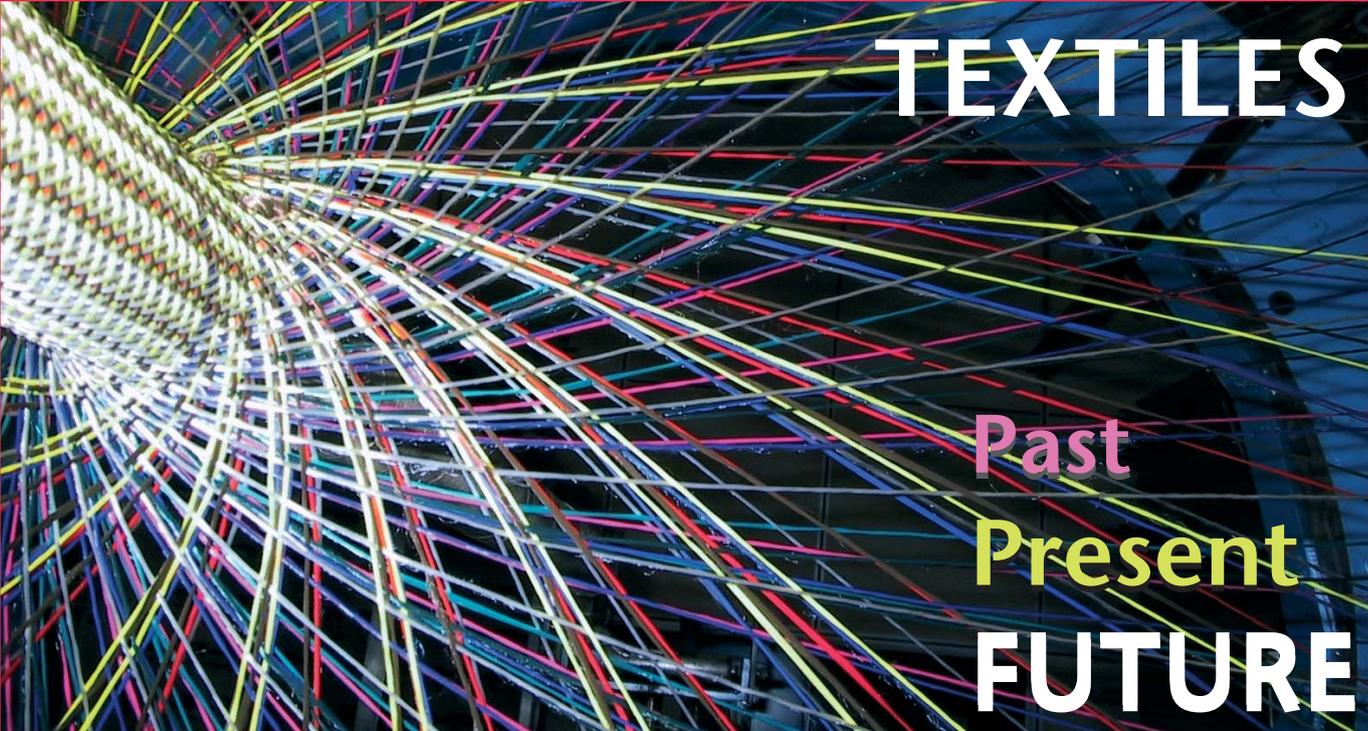
Nevertheless, a limited number of new forms of action have been introduced:

- support for ‘joint technological initiatives’ that can be put into place on the basis of various strategic avenues of innovation identified by the ‘Technology platforms’ in various industrial or pre-industrial sectors;
- EU support for ‘variable geometry’ projects involving a limited number of Member States, as provided for in the Treaties;
- the promotion of a new private financial dynamism for the development of research with a high innovation potential, through the Risk-Sharing Finance Facility device, developed with the European Investment Bank (EIB).

As for the rest, there will be strengthened synergy between the Framework Programme and the other policies pertinent to the Lisbon Strategy, ranging from the Structural and Cohesion Funds to education, and including European enterprise and innovation policy and trans-European networks.

To find out more

- europa.eu.int/comm/research/future/index_en.cfm
- <http://www.cordis.lu/fp7/>



TEXTILES

Past
Present
FUTURE

Braiding machine – IFTH prototype ©IFTH

Close to the body, inextricably linked to our well-being, a means of expressing our personality, and present in a thousand ways in our day-to-day activities: textiles occupy a truly unique position in terms of man's relationship with matter. One could say they are part of the fabric of human society. From the artisanal production of the distant past to the advent of modern industry, textiles have remained a field in which a flair for creativity and the search for innovation have been a constant source of inspiration and inventiveness.

Europe has always been a key player in the ever-changing world of textile innovation. Throughout the 20th century, it was the sector's number one producer and trader at each of the many stages of fabric production, as well as in garment making and in the fashion industry – which acts like a dynamo for the entire sector.

Over the past two decades, however, this industrial fortress has been subject to constant wear and tear. The competitive battle began primarily in the labour-intensive clothing sector, whole areas of which have migrated to low-wage countries.

More recently, an even more important change, this time affecting the complete chain from fibre production to the woven finished products, has come to threaten the industry as a whole. All the systems for controlling

world textile trade – known as multifibre agreements – have been progressively revised. In this respect, 2005 is a pivotal year. It marks the beginning of a new and completely liberalised world textile trade, completing the process of quota dismantling that began a decade ago during the Uruguay Round of world trade talks.

In the new conditions of an increasingly multipolar global economy and the growing industrial strength of emerging countries – such as China, India, Pakistan and Brazil – the textile sector seems to be a particularly sensitive point for Europe.⁽¹⁾

In meeting the formidable challenge of global competition, this sector – which employs 2.5 million people in the EU-25 – will have to draw on a wide range of EU competences in the field of social, enterprise, regional and international relations policies. At the same time, attention – and the hope of saving, or rather reinventing, the sector – is turning to the research and inventiveness that Europe can harness to bounce back and remain a market leader. After the continuous innovation of the past century, there are doubtless still some surprises in store.

(1) At the request of several Member States, the European Commission launched a procedure to implement safeguard measures aiming to counterbalance Chinese textile imports at the end of April.

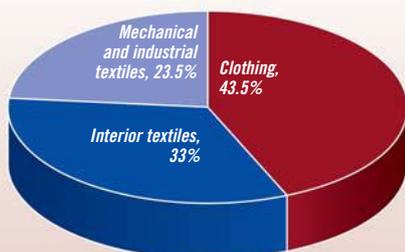
Tailoring EU textiles to meet global competition

A giant with feet of clay – that is the general image that comes to mind of the overall state of the European textiles and clothing sector (T&C). The erosion of this industrial fortress is all the more worrying as it is still of major importance to the EU economy, accounting for 4% of industrial gross domestic product (GDP), 7% of manufacturing jobs, and a surprisingly large export volume that, despite a trade deficit for all categories combined, makes Europe the worldwide leader in textiles and clothing sales. Such a global analysis paints a simplified picture, however, and one that fails to reflect the complexities of a sector in which each segment has its own characteristics.

Concerns about developments in Europe's textiles and clothing industry are not new. While problems in the clothing sector are rightly the focus of attention, they should not conceal the very different situations found in other areas. Over the past decade, falling production in the labour-intensive clothes-making segment has led to the loss of almost a million jobs and tougher competition will certainly add to the losses in a field that generated 43.5% of the industry's global turnover in 2003.

Yet in terms of foreign trade, the segment shows a paradoxical picture. During this same reference year, while the EU's trade deficit was €35 billion, it remained the world's number two clothing exporter (€15 billion).

Textile production in the EU



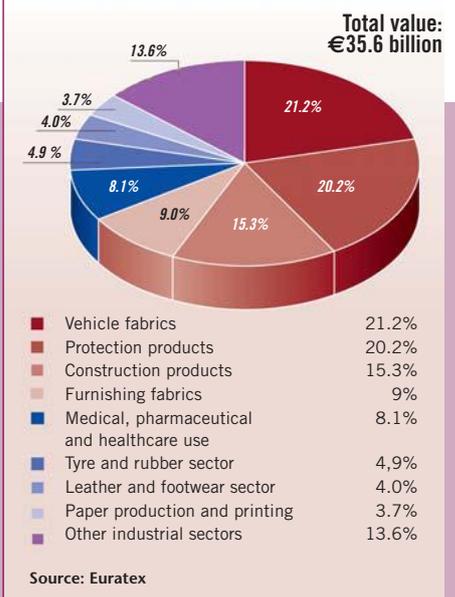
Source: Euratex – CIRFS 2003 data

The complex reality of relocation

This ability to sell on foreign markets while importing more reflects one of the fundamental aspects of the highly controversial phenomenon of relocation. Prior to their recent accession, there was relocation to the new Member States and this is now continuing within a so-called 'pan-Euro-Mediterranean' zone (including countries such as Morocco, Tunisia, Romania, Bulgaria and others).

A complex link has been established between Europe, that remains a garment-making and fashion centre of primary importance – supported by a huge and increasingly unified internal market and a major external market on which its products are much in demand – and industrial sites that have relocated outside its borders, acting as both suppliers and sub-contractors. As part of their supply strategy, the major clothing retail circuits are including a growing number of these external partnerships that bring mutual benefits – but with cruel consequences in terms of European jobs – with a production pool in close proximity. In the context of the newly liberalised global market, that was completed in 2005 (see page seven), it is also these suppliers and sub-contractors that are at the front line in the face of Asian competition.

Consumption of technical textiles in Western Europe by application (2004 estimates)



From fibre to fabric

"While the clothing sector is the most visible and most sensitive part of the textile problem, no sectoral analysis is possible without taking into account the totality of the long and complex production and processing chain stretching from the fibre to the fabric," stresses Lutz Walter, head of R&D with Euratex⁽¹⁾. When the fibrous raw material is natural – essentially cotton or wool – it must undergo purifying and cleaning treatments that vary depending on the original characteristics and quality. In addition, synthetic fibres, which currently account for the greater part of the sector's basic materials, originate in the chemicals industry.

(1) The European Apparel and Textile Organisation

The chain subsequently consists of a succession of specialised trades – spinning, dressing, dyeing, weaving or knitting – some of which are carried out by distinct industrial players. These intermediary stages have long been largely automated and capital intensive. On completion of this traditional chain, there is then a whole range of possible finishing treatments (printing, waterproofing, hydrophilisation, etc.), that come under the generic name of ennobling and that depend on the final use and quality of the fabrics or materials produced.

“Today, it is the field of technological innovation that is particularly active,” notes Walter. “In the future, competitiveness will lie in perfecting the functional uses of textiles and not in the race for new raw materials and innovative production methods as was the case in the last century.”

Fabric for new uses

At the end of this series of operations, more than half of all textile products find other markets than the clothing industry and the range of outlets is growing increasingly diverse. The interior textiles market segment (from carpets to bedding, and including curtains and wallpaper) is of considerable importance. This represents one-third of European production and, thanks to extremely advanced technological automation, the Union has retained a relatively intact competitive advantage in this field. But that does not mean that European manufacturers are out of all danger in the face of the increasing power of competitors in the global economy.

The other major non-clothing market is technical textiles. This is an area particularly rich in technological innovations, producing products with high added value to meet an increasingly wider range of sophisticated needs in the industrial and service sectors (automobiles, aerospace, food, construction, agriculture, medicine, pharmacy, specialised fabrics for sport, work, protection, and comfort). Walter believes that “the



Europe is particularly strong on the design front. Here, the latest uniforms worn by Air France hostesses, created by fashion designer Christian Lacroix. ©Musée Air France

growth of these markets – with their growing constellation of niche markets – is particularly dynamic. They currently account for almost a quarter of European textile product sales, compared with around 15% at the beginning of the last decade. In any event, it is generally viewed as an area in which the Union is in the strongest position, provided this is prepared to make the major research and development effort.”

Threadbare markets

Behind these major categories into which the sector can be broken down, the reality of the textiles and clothing industry is one of a vast array of operators often acting autonomously within their particular ‘window’. In 2003, in the EU-15, 177 000 companies were active in this branch, the majority of them SMEs employing fewer than 20 persons. This fragmented structure is clearly a handicap when it comes to investment capacity and innovation.

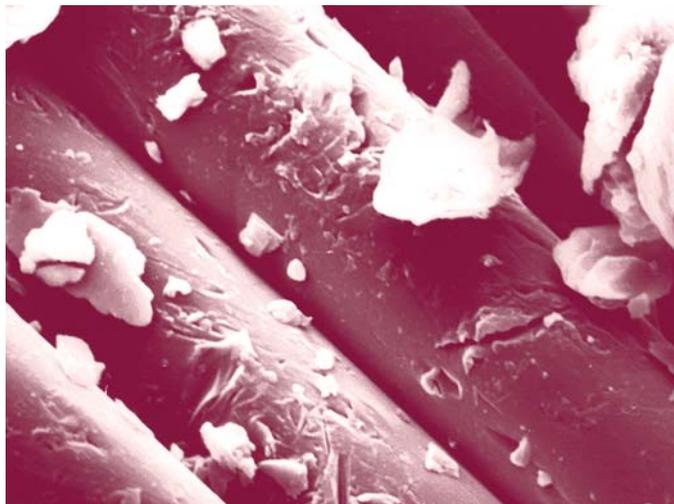
In addition to this marked fragmentation, another distinctive feature – for easily understandable reasons of commerce in the different products – is a high geographical concentration in certain EU regions. This is an additional source of concern as it also concentrates and amplifies the socio-economic effects of the competitive threat.

To conclude, the health of the massive European textiles sector is cause for concern. Given the labour costs, production in the clothing branch inside Europe is certain to continue to decline. In this respect, the competitive advantages enjoyed by the new EU Member States are likely to prove short-lived as they too come under attack.

To find out more

● Lutz Walter, Euratex
lutz.walter@euratex.org
www.euratex.org

More globally, over the past few years the indicators have been pointing to the erosion of the market at all the high-tech stages of the production process. Fibre production (€99 billion in 2000) was down 13% in 2003. Weaving (€23.7 billion in 2003) is 21% down on its record 1997 level.



Simulation of ageing and environmental constraints makes it possible to measure the efficiency of a geotextile using SEM (scanning electron microscope) imaging. ©W.Gündisch-ITV Dekendorf

Crusader for innovation

Paul Kiekens, the Head of Ghent University's (BE) Department for Teaching and Research on Textile Sciences and Technology, is a tireless innovator and determined campaigner who refuses to accept the inevitability of decline. At Autex, which he founded ten years ago, he advocates a radical, bold and European approach to restructuring the industry.



Visit by Philippe Busquin to the University of Ghent Textile Laboratory (BE).
Inset, Paul Kiekens

■ How do you view the serious threats to the sector's future in Europe?

Paul Kiekens – By its very nature, the textile industry is, first and foremost, a mass-production sector. It produces essential goods that are as vital to people as their daily diet. Economic history clearly teaches us that, for today's affluent societies, it has been a particularly powerful motor for growth, jobs and prosperity. A motor that the emerging nations have every reason to seek to appropriate. For them, it is a clearly traced road to industrialisation and a place they are determined to take up at the table of the global economy. What is more, they possess all the assets they need to do so, in terms of demography and competitive wages.

We must face the reality of the situation. Two decades ago already we first began to lose the textile activities on which we had based our international leadership and this process will continue. Others are able and will be able to exploit the technologies we invented with an economic efficiency that we cannot match.

■ Does this mean the end of textiles within the European economy?

As far as the textile tradition that we built up is concerned – and I believe we have been very blind and lacking in foresight as to its sustainability – yes. It is a serious crisis and extremely painful in social terms.

But it is evident all around us that the wheel of technological history is not stopping. On the contrary, it is accelerating and has taken the form of the knowledge society. Just as they were in our industrial past, textiles – products so close to and so complementary to humans, so much a part of our everyday life – are now the agents of this exponential acceleration of the knowledge

society. Europe is, in fact, very well placed to establish itself as a key player in this new environment.

■ What, specifically, does this new environment demand?

Nothing less than a radical reinvention of the field of application of textiles in our society and, on that basis, a genuine industry renewal. Everything must be rebuilt on a paradigm of research and innovation, not on the usual sectoral basis, but on one that is totally open to every possibility. In the face of the crisis in their sector, textile specialists cannot do much by limiting themselves to developments rooted in their traditional know-how.

In future, they must become the explorers and communicators of all that is happening in other disciplines. They must seek out fundamental discoveries and the latest applications in biochemistry, medicine, physics, material science, information and communication technology, engineering, etc. Amid the ocean of knowledge, new forms of textile intelligence must be created, putting textiles in places you would never expect to find them, and endowing them with attributes that other materials do not possess.

■ What would be your priorities in an emergency plan for European textiles?

First of all, to ensure the new impetus we need, there must be a drive for education and the high-level training of new generations of researchers. There is something paradoxical about advocating the recruitment of young people, the most brilliant possible, on board a vessel that today has the reputation of a foundering Titanic. To convince intrepid minds

to hop aboard, universities, research centres and professional organisations must shake up their often compartmentalised and fossilised training structures. They must render them attractive through unrivalled excellence. They also need to open the doors to a very rich interdisciplinarity. In any event, this is the battle that Autex is fighting.

Secondly, sufficient funds must be mobilised. If Europe wants to retain a significant textile industry, then it needs to invest in 'laboratory companies' which are a constant source of inventiveness, innovation and daring. This textile intelligence sector cannot develop without the absolutely essential access to risk capital.

I would add that this renaissance – or restructuring – of the very ancient and rich tradition of our textile industry only has any meaning if it is first and foremost European. The time when each country or each region wanted to save 'its sector' is over. In this respect, I regard the creation of the European technology platform for the future of textiles and clothing as major progress.

To find out more

● Autex - Association of Universities for Textiles
www.autex.org

Contact

● paul.kiekens@UGent.be
● textiles.UGent.be/

The synthetic *past*

Until the end of the last century, Europe was a key player in textile innovation. The technological excellence on which it built its strength and international reputation was largely rooted in the chemistry of the raw materials. We look at the birth, high point and decline of a saga that is drawing to a close.

Beginning amid the flurry of scientific activity that marked the end of the 19th century, the saga of the modern textile industry was born of the obsession of a handful of experts who tried to go beyond nature – previously the sole provider of fibrous raw materials – by imitating it. The challenge of this time was to reproduce the ‘spinnable’ qualities of natural silk, that most noble of textiles. In 1884, almost by accident when chemically treating plant cellulose, the English chemist Joseph Swann⁽¹⁾ developed the first spinnable yarn that he named artificial silk.

The adjective caught on. The sustained efforts of other pioneers, in particular the Frenchman Hilaire de Chardonnet, finally resulted in the first genuine artificial textiles industry. This reached its pinnacle between the First and Second World Wars, in particular with rayon fabrics.

Meanwhile, on the chemicals front, intensive fundamental research led to the discovery of the macromolecular nature and filiform chain structure of textile fibres. Beginning with superpolymers originating in the petrochemicals sector, the shift from artificial fibres to ‘synthetic’ fibres came about in the 1930s. The first product of this new industry remains a historical reference: it was called nylon.

(1) He worked with the American Thomas Edison on the production of filaments that were used in the first incandescent lamp.

The synthetic age

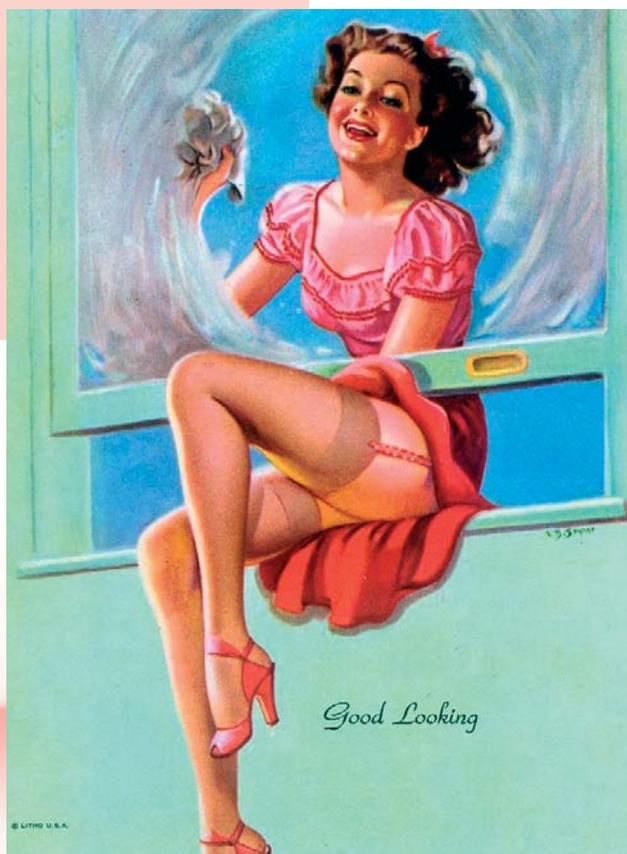
The boom period that followed the Second World War was the golden age for developing families of innovative synthetic fibres, such as acrylic, polyester, aramids, chlorofibres and elastothanes. Each was used in a range of woven products and gave rise to famous brands – Dralon, Crylor, Orlon, Tergal, Kevlar, Rhovyl, Lycra, etc. – with their distinctive characteristics in terms of finish, waterproofness, feel, brilliance, elasticity and washability.

This inventiveness was the fruit of a sustained and major research effort by the big players in the chemicals industry of the industrialised countries – and especially Europe – such as Rhône-Poulenc in France; Bayer, BASF and Hoescht in Germany; and Courtauld in the United Kingdom. This boom in synthetic textiles continued until the early 1980s. Sometimes mixed with natural fibres, they came to represent more than half of the world’s textile supplies. This development made a major contribution to the strong global position Europe occupies to this day.

An ebbing dynamic

The reality of the textile industry has changed. Due to overabundance and saturation, the dynamic based on innovation and the mass production of basic fibres – under the auspices of the chemicals industry – ceased to be the engine for growth.

Concentrating on the limited expansion of ‘primary’ characteristics, yesterday’s innovations have, in a sense, become commonplace and ceased to provide a competitive edge. One of the major concerns of Europe’s textile industry is that, over the past decade or more, it seems to have been lacking a new direction for innovation, this lack of impetus reflected in a considerable fall in investments in research and development. ■



Poster presented in *Nylon Blues*, documentary by Françoise Levie (1991).

To spark renewed innovation and competitiveness, the textile sector is seizing a new opportunity for growth. It is doing so by opening up to the latest changes in all areas of science and technology.



Re-tailoring knowledge

The mission of textile scientists and engineers is to break out of their traditional haunts and explore other areas of knowledge in the hope of finding new and unexpected applications for their sector. As Lutz Walter (Euratex) explains, “apart from the new technologies that could bring changes to the production line, the new paradigms, both for the raw materials and the finished products, are multifunctionality, reactivity, and the material intelligence of fabrics. Some applications are picked up on by designers and fashion houses – who are always in search of inventiveness – others are targeted more particularly at the many new niches on the technical market.”

Dyeing for an alternative

Upstream of the production process, biotechnological applications are one example of innovation, in particular concerning the traditional preparation and processing of natural fibres. Before cotton and wool – which make up the lion’s share of the raw material – is woven, chemical operations are required to remove impurities, scour the materials and make them suitable for the dyeing process. These operations are financially and environmentally costly. Research has focused on finding possible biological solutions.

These have promising benefits in terms of process performance that have been demonstrated clearly in pilot projects and alternative processes using enzyme properties are beginning to become effective in replacing the use of chemical agents. However, problems of stability and reliability remain to be solved before they can be developed on an industrial scale.

A satellite eye for colour

A surprising technology developed by the European Space Agency (ESA) in the field of colorimetric recognition has been applied in the quality control of dyed fabrics. For satellite observation applications in the



Protective glove for the cutting table used in garment making. ©IFTH

LEAPFROG or the reinvention of the sewing machine

If there is one machine for which progress appears to have ground to a halt, it is the sewing machine, which dates back to the years 1830 to 1850. Although it has been constantly perfected, contemporary technology has not budged an inch on one essential point: no satisfactory alternative has been able to replace the human operator. Until now only the dexterity of the human hand has had the suppleness and flexibility to guide the passage of the fabric during the complex processes that go into making up a garment. Hence the distinctive labour-intensive nature of the industry.

Launched in 2004, the EU-backed Leapfrog⁽¹⁾ project has a singular technological challenge at its heart. “Many developments in the

field of automated sewing on spherical forms with the aid of 3D visualisation suggest that a significant automation of the garment-making process is possible,” stresses Lutz Walter (Eurtext). The project also aims to integrate a flexible and computerised production chain management that adjusts in line with consumer demand and preferences.

(1) Thirty-five industrial and university partners based in 11 European countries are co-operating on the Leapfrog (Leadership for European Apparel production From Research along Original Guidelines) project. Budget: €23 million (60% provided by the EU. Duration: 4 years.

To find out more

○ www.leapfrog-eu.org



The self-cleaning and hydrophobic properties of textiles manufactured using the nanotechnological process known as the Lotus effect®. ©V.v.Arnim-ITV Denkendorf

field of agriculture, ESA engineers developed a kind of 'artificial eye' to monitor the use of chemical fertilisers on cultivated land, detectable in soil colour. The Finnish company Specim, in association with a number of Italian partners including the University of Coma, transferred this optical technology and used it in an automatic system capable of inspecting textiles during the production process as the material flows by uninterrupted at a rate of 100 metres a minute. This electronic eye can detect colour irregularities 'in real time', enabling any manufacturing faults to be corrected immediately.

However, it is at the final stage in the production chain that many of the significant innovations are found, at the time of ennobling or surface treatment. A typical example is the exploitation of plasma physics. This makes it possible, for example, to waterproof an absorbent textile such as cotton or to neutralise the hydrophobic properties of a synthetic woven material.

In addition, returning in a sense to an earlier fascination with the silkworm, the study of the complex structures of living organisms and natural processes in all their biodiversity also represents a field of inquiry rich in potential inspiration.

Self-cleaning with the 'Lotus effect'

A surprising discovery was also made in botany, a discipline that is far removed from the textile industry and its problems. The German researcher Wilhelm Barthlott of the Bonn Institute of Botany (DE) discovered, in the 1990s, that the lotus plant, admired for the resplendence of its flowers and leaves, owed this property to the high density of minute surface protrusions. These protrusions 'catch' deposits of soil and grime, preventing them from sticking. When it rains, the leaf has a hydrophobic reaction. The water rolls around as droplets, removing grime as it moves.

Reproduced for nanotechnological processes on the surface of woven fabrics, this self-cleaning property was developed as

a technological innovation and patented under the name the Lotus effect®. It is used for specific niche markets, such as for sails or certain garments. This example shows to what extent the marriage of knowledge in fields that would appear to be worlds apart – in this case botany and nanoscience – can give rise to unexpected innovations.

Curative textiles in chitin fibre

Another example, of medical value this time, is chitin. This abundant biopolymer, whose structure resembles plant cellulose, is found in shellfish and the external skeleton of many insects.

It is currently the subject of extensive research in the fields of agriculture, food and cosmetology. A particularly promising textile application is currently being studied at the University of Ghent (BE). This consists of developing chitin-based fibres to produce medical dressings that would help to reconstitute skin in serious burn cases, as well as providing an anti-bacterial barrier. ■

What strategy for European textiles?

In 2004, a 'Technology platform for the future of textiles and clothing in Europe through to 2020' was set up by the three major European organisations involved in research and technological development – Euratex, Textranet and Autex. This grouping of experts from all backgrounds has identified three pillars for reflection, proposals and initiatives between now and the year 2020.

1. Increased emphasis on the production of specialised goods with a high added value.
2. Increased R&D for new textile productions.
3. A move away from production designed for mass consumption to product personalisation.

To find out more

○ Lutz Walter, Coordinator Euratex
lutz.walter@euratex.org
www.euratex.org

We are familiar with the concept of 'intelligent' machines. Now a new breed of 'intelligent' materials – which sometimes seem to belong more on the pages of a science fiction novel – is emerging. Research into these fabrics of the future is very real and increasing all the time.



Subtle textiles that warn in the event of medical symptoms are built into underclothes or other fabrics worn against the body. Developed by Philips Research. ©Philips



Sensitive fibres for extreme situations. © Grado Zero Espace

Inwoven

INTELLIGENCE

These futuristic explorations aim to give textiles the capacity to perceive selected aspects of their environment, reacting, for example, to differences in temperature, electrical or magnetic fields, lighting conditions or ambient colours. Depending on the stimuli, they can adapt by changing shape, insulation power, colour or elasticity. In other words, they are able to correct a situation spontaneously. If necessary, they can provide cognitive functions, such as the recording and storage of data, or the sending or reception of signals. They can even operate as polyvalent intermediaries for remote information and communication. However fantastical this may seem, the fact is that the first concrete practical applications are already being realised.

Dealing with extreme conditions

Attempts are being made to develop a new generation of 'reactive' fibres or fabrics with a 'sensorial electronic conductivity' that incorporate flexible and imperceptible nanofibres (of nickel, copper, silver, etc.). This textile intelligence is clearly of great interest to the military, a field in which attempts are being made to develop clothing that reacts symbiotically with the environment and increases the sharpness of the senses. The armed services are also looking

for garments that offer higher protection and the ability to communicate between personnel in the field.

Another very high-tech sector concerns continuous security monitoring on manned space flights as well as matters of 'comfort' for the crew (see box). This latter concern of course applies to all missions in extreme environmental conditions. Intelligent textiles developed for military or space applications can also be transferred rapidly to other high-risk civil uses such as operations in underwater or polar environments, combating fire or industrial disasters, or radioactive decontamination.

Beyond white coats

This quest for intelligent textiles can also potentially generate a wide range of applications in many fields, such as sports and medicine. The interactivity between humans and textiles makes it possible to go beyond present technologies of localised skin sensors which are not very versatile.

Underwear is being studied, for example, that is able to react to changes in body rhythm indicating cardiovascular or diabetic irregularities. In this way, textiles could be used to monitor a person's vital signs. Researchers at Philips

have developed a bra made of a textile that can record data and emit a signal in the event of a cardiac problem.

For its part, Belgium's Centexbel is studying the textile transposition of a known technology for the rehabilitation of paralysed limbs. This process is known as functional electrical therapy. It is based on the stimulation of certain motor functions through electrodes that transmit electrical microwaves. "The aim is to integrate this FET motor aid into a textile structure that would offer the patient a user comfort on a completely different level to present devices," explains researcher Fabrice Pirotte. "For that, we are aiming to develop a sensorial fabric containing sufficient conducting fibres for the passage of microwaves."

Trendy technology

These innovations have also attracted the interest of fashion designers. Prototypes have already been presented of garments based on fibres fitted with microcapsules able to release chemical reagents depending on temperature or light intensity, etc. A blue T-shirt that turns white when the sun comes out, summer dresses that exude a perfume that, when needed, can repel certain insects, are just two examples.



Waterproof testing a protection suit. ©IFTH

Fascinated by this marriage of fashion and technology, French designer Olivier Lapidus works regularly with research centres and has already registered a number of patents. In 1996, he presented an anorak with solar sensors and micro batteries that regulated the fabric temperature. In 2002, in association with Nokia and Sony, he designed a jacket with a built-in mobile phone whose screen and keyboard are concealed in the sleeves and speakers and microphone in the collar. Another designer, Elisabeth de Senneville, is studying clothes able to filter out pollution and dust, following in the footsteps of the anti-perspiration, anti-bacteria, and even anti-stress textiles that are already a reality.

The Belgian company Verhaert Design & Development, in co-operation with the Université Libre de Bruxelles, has developed the Mamagoose Babygro. This garment monitors the heartbeat of babies during their sleep and gives the alert in the event of respiratory arrest. It provides a much more comfortable alternative to the various sensors placed under infants at risk of cot death.



The Mamagoose Babygro monitor heartbeat and respiratory arrests in babies likely to fall victim to cot death. ©Verhaert

The Belgian company Verhaert Design & Development, in co-operation with the Université Libre de Bruxelles, has developed the Mamagoose Babygro. This garment monitors the heartbeat of babies during their sleep and gives the alert in the event of respiratory arrest. It provides a much more comfortable alternative to the various sensors placed under infants at risk of cot death.

Close-up of a textile's behaviour when exposed to fire. ©IFTH

Ground control

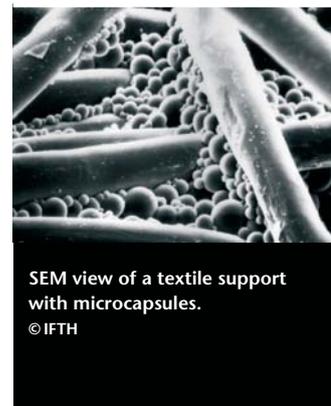
In an entirely different niche market, the Bidim company, a specialist in unwoven⁽¹⁾ textiles used in construction, has developed a sophisticated system for detecting ground or subsoil movements that functions as a remarkably precise control and warning system. The process involves providing geotextile structures with polyester micro-sleeves containing what are known as 'Bragg grating' optical fibres. When a beam of light crosses the fibre, each network reflects a characteristic wavelength. Any ground deformation disturbs the 'normal' wavelength and millimetric variations can be measured to a precision of 0.01%. ■

(1) The term 'unwoven' designates textiles obtained from a direct mixing of fibres, without any spinning or weaving. Dispensing with these traditional stages in textile production, this particularly economic process is becoming increasingly widespread and the market for these products is growing rapidly for many technical uses that do not require an elaborate finish.



Visualisation test of airbag behaviour.

© T.Stegmaier - ITV Denkendorf



SEM view of a textile support with microcapsules.

© IFTH



Hollow synthetic fibres viewed under a scanning electron microscope (SEM). © IFTH

Baby astronauts

The sophisticated suits worn by astronauts are a remarkable source of inspiration for textile intelligence. The European Space Agency's Spacelink programme – a proactive network promoting the transfer of space technologies to terrestrial applications – has developed three examples of particular significance.

For 'children of the moon', who suffer from a rare light sensitivity disorder (*xeroderma pigmentosum*) and cannot be exposed to ultraviolet rays, the ESA has developed anti-UV underclothes, as well as refrigerated transparent hats that could soon be commercially available.

Another application has been the subject of attention for a number of Spanish SMEs, under the leadership of the Zodiac company (which helped design the European spacesuit), as part of the Eureka project. By studying the thermal control systems of spacesuits, the partners came up with an underwear design that allows the body to retain a stable temperature in all circumstances. This application is of particular interest to fire fighters, the wearers of bullet-proof vests and also bakers and motorcyclists. In this case, it is not so much the textile as the technology built into the garment – a sophisticated system of air circulation and heat exchange – that creates the optimal conditions.



For Cyprus, a republic with a troubled past, joining the knowledge society is a major challenge. The difficulties inherent in its remote island location were not made any easier by partition, introduced in 1974, which for many years failed to prioritise science and research. Despite this, the island has a centre of excellence of European renown: the Agricultural Research Institute (ARI). Cypriot research is a recent phenomenon – the University of Lefkosia (Nicosia) was only founded in 1992 – but is driven by youthful enthusiasm and ambition with the focus firmly on innovation.

The University of Lefkosia, in Nicosia. "We are too small and have too few industrial outlets to achieve a high level across the board. Our strategy is therefore to develop poles of excellence."

Eastern outpost of the European Research Area

ACTIVE INVOLVEMENT

Cypriot researchers are involved in the majority of Europe's principal research programmes. The Fifth Framework Programme financed 160 projects and 100 have already been selected in the Sixth. Since 2000, the COST action has enabled the island's scientists to participate in 85 thematic networks, 62 of which are still active. Cyprus became a member of the Eureka initiative in 2002, contributing to six projects.

Our past has taught us that education is the one thing that nobody can take away from you and the Cypriots are a very educated population," stresses Sophocles Hadjisophocleous, Head of the National Contact Point for information technologies under the Sixth Framework Programme. "Many of them have trained in Europe – east and west – and the United States. This scientific diaspora provides us with a pool from which we can draw excellent researchers with access to networks in many countries." Today, going abroad to study is no longer a necessity and the University of Lefkosia (Nicosia), founded in 1992, has more than 4 000 students.

Neurology and genetics

The 1990s brought a new focus on science and research, and in 1990, the Institute of Neurology and Genetics (ING) was founded. Five years later, thanks to grants from the United States and aid from the UN, it moved into brand new premises on the hills overlooking Nicosia. Today, this private non-profit-making organisation employs a staff of 130 and carries out its research for the benefit of both the island's communities. It had no problem recruiting several dozen high-level Cypriot researchers from a number of renowned laboratories – including Imperial College London and the Institut Pasteur in Paris. Guided by a spirit of great scientific freedom, it offers clinical services (such as biological diagnoses) alongside its research activities.

The ING has specialist teams working on most of the major neurological diseases (multiple sclerosis, epilepsy, muscular dystrophy, etc.) and is also engaged in the study of genetic diseases. "Cyprus is an island that has seen successive waves of colonisation, resulting in a very original and interesting genetic profile," explains Kyriacos Kyriacou, Director of the Department of Electronic Microscopy and Molecular Pathology. The ING's ambitions extend beyond the local context and it could in time become a genuine regional centre, as demonstrated by successful co-operation with research bodies in Israel and Jordan, resulting in the identification of the genes responsible for rare regional syndromes, for example.

Engineering

These regional ambitions are shared by many of the island's scientists. Charalbos Doumanidis – recently attached to the famous Tufts University in Boston (USA) and now Director of Nicosia university's new school of engineering – can confirm this. "We are too small and have too few industrial outlets to achieve a high level across the board. Our strategy is therefore to develop poles of excellence – for example, in my case in the micro-nanotechnologies and biomedical engineering. Here in Cyprus we can offer a high-level environment for work and study and welcome students and researchers from nearby countries." In this way the island could be an outpost of European science in the Middle East and serve as a cultural and scientific crossroads in a richly diverse region. ■

To find out more

- Cyprus Research Promotion Foundation
www.research.org.cy
- University of Cyprus
www.ucy.ac.cy

The agricultural tradition



It is a large cricket of the genus *Schistocerca gregaria* with a purplish body and a pair of enquiring antennae. No great surprise that it does not like being raised in this glass cage while outside lemon trees, vines



This ability to respond quickly to the emergence of new problems is typical of the ARI, one of Cyprus' leading research organisations. With a team of 70 researchers and many hundreds of publications to its credit, this recognised EU centre of excellence is expanding its competences in many fields linked to agriculture and the environment. One such field is water management, a subject of major regional concern in terms of sustainable development. "For many years now there has not been a single drop of irrigation water circulating in an open-air system anywhere on the island," explains a proud Ioannis Papadopoulos, Director of the Institute. "It is all piped and the drip-type method ensures the system is as economical as possible. Our water transfer efficiency is over 90%." That is a figure that beats most of the major agricultural countries in temperate Europe.

The ARI is also interested in any agricultural developments in the Mediterranean countries in general, such as the use of salt or waste water, management of the resulting heavy metal problems, or accurately determining the water requirements of various plants. These studies are often carried out within the framework of European programmes, such as Hortimed or Irrisplit. The institute also seeks to be active in new and emerging fields. Molecular biology is frequently employed, for example, and the ARI researchers are currently developing a flock of sheep and goats of the local homozygous race so as to produce a gene that resists scrapie, a BSE-related disease that is much feared by livestock farmers.

Various programmes are also concentrating on biological farming. "For a number of years now the ARI has been trying to respond to society's demands to reduce the use of pesticides, both for environmental reasons and in the interests of food safety," explains Nicos Ioannou, Director of the ARI's Plant Protection Department. This is not easy in a hot climate in which pests flourish. Each major crop has its own

and vegetables grow in the warm Cypriot sunshine. But the reason it is here is that a few months previously fellow members of this species landed from who knows where to feast on the local culinary delights. To combat this sudden invasion, agronomists at the Agricultural Research Institute (ARI) decided to set up a rearing scheme.

parasite – and often more than one. The strategy of breeding useful insects has produced some interesting results that are well suited to the local climate and are enabling a considerable reduction in the use of chemicals. For example, a particularly voracious caterpillar with a taste for citrus fruits, *Phyllocnistis citrella*, would be ill-advised to take up residence on Cyprus where its four principal wasp parasites have been introduced and are being bred at the ARI laboratories. The researchers' insectariums also contain a number of acaridans (*Phytoseiulus persimilis*) and coleopters (*Orius sp.*) that prey on the various parasites.

To find out more

● The Agricultural Research Institute
www.ari.gov.cy



Schistocerca gregaria – a current target for researchers at the ARI. Familiarly known as desert locusts, these insects invade arid regions, mainly in Asia and Africa. They can adapt to a range of environments and reproduce at a staggering rate – which spells disaster for the harvest.

RPF: an independent foundation

Cypriot research benefits from the assistance of the Research Promotion Foundation, set up in 1996. A non-government organisation – although established by the state and still dependent on state subsidies – it is managed by an independent steering committee. This ensures a high degree of flexibility, offering it the scope to promote and facilitate scientific research in many ways. The RPF directly finances certain projects by launching calls for tenders – in this way about 20 million CYP⁽¹⁾ is being allocated for the 2003-2005 period. The Foundation also facilitates contacts between Cypriot researchers and the major European programmes (Framework Programme, COST, Eumedis) as well as promoting bilateral agreements, in particular with France, Austria, Slovenia and Germany. Finally, it seeks to foster relations with Cypriot researchers working abroad, drawing on their skills and networks to facilitate the work of their compatriots.

(1) The Cypriot pound (CYP) is currently worth €1.7 (May 2005).

Birth of Europe-backed research

Laboratory at the Malta Centre for Restoration (MCR). Use of a video microscope to analyse the rate of corrosion on a sample from the armoury collection at the Armoury Palace, Malta.



With a university traditionally devoted exclusively to teaching, no specific research grants and no research ministry, it would appear that in the past Malta – population 400 000 – did not prioritise science. But all that changed in 2001 when it achieved the status of official EU candidate state. Its European commitment has since given it the opportunity to develop an almost virgin research area.

Specialising in 'heritage'

"We want to make Malta an international centre of excellence for the conservation and restoration of our heritage, including metals, paintings, books, ceramics, etc.," declares Christian Degrigny, Head of the MCR's (Maltese Centre for Restoration) diagnostics centre. Housed in a former hospital built by the English during the last century, the MCR was founded in 1999 at the initiative of the university and Education Ministry. It trains experts in the scientific investigation of works of art.

The MCR co-operates on many projects, both European (in particular Ikonos, COST G8 and Promet) and international, such as the International Atomic Energy Agency (IAEA) and the Committee for Conservation of the International Council of Museums (ICOM-CC), where Christian Degrigny heads the 'metals' group.

To find out more

- www.mcr.edu.mt
- www.icom-cc.org

"Research here is new," Michael Refalo – National Coordinator for the Sixth Framework Programme on the Maltese Council for Science and Technology (MCST) – has no hesitation in stating. A tiny island state lying between Sicily and Tunisia, Malta has a services-centred economy (finance, tourism) and a traditional manufacturing industry that has long been sheltered by a protected market, as a result of which innovation was not the major concern.

European impetus

Union membership has changed the way of thinking, however, and the available resources. "At first, when informing companies and universities about the Commission's calls for proposals, we were rather unsure about our capacity to participate," continues Mr Refalo. "But we learned to identify those instruments of Community policy that are best suited to our size and the exploitation of our research potential." Born of this European impetus and charged with advising the Maltese Government in this new field, the MCST drew up the first-ever Maltese programme for research, technological development and innovation. Launched in 2004, this is very much a pioneering step for a state that, lacking the infrastructures, had never before allocated public funds to research. Two principal means of financing

were adopted: tax reductions for innovative companies and the allocation of subsidies, mainly linked to Structural Funds assistance. "It is the first time the MCST has been able to allocate funding, even if it is limited. The call for proposals closed in January and the results should be available soon. In any event, the demand is high and the grant applications come to ten times the amount available," explains Joseph Micallef, researcher and member of the MCST.

Malta Enterprise, the national agency charged with attracting foreign investment and helping the development of local industry, has also come to recognise the importance of R&D. It launched Innovation Framework 2004-2007, a set of actions and tools designed for SMEs, investors or those with technological expertise. Joseph Sammut, Director of Technical Development and Innovation at the agency, draws particular attention to the success of the Korbin business incubator. Launched in 2001, this offers facilities, development aid and common services for a period of three years to high-tech start-ups (see Aquabiotech box). The experience has proved so successful that Malta Enterprise is currently thinking of doubling its capacity.



ICTs and durability

Information and Communication Technologies (ICTs) are central to Malta's innovation policy as the island is among the most developed of any EU Member States in terms of e-government. In the field of industry, STMicroelectronics, a Swiss multinational that makes integrated circuits, has a plant on the island which accounts for a large share of Maltese exports. Its presence has, in turn, generated start-up SMEs.

Sustainable development is also vitally important for a country that is Europe's smallest but also most densely populated state (over 1 000 inhabitants per km²) and lacking in natural resources. The Environmental Protection Agency (Mepa), also charged with town and country planning, plays a key role in this field. "We have commissioned the universities and private firms to carry out a number of studies. It will take us five or six years to comply with European environmental demands," explains Marie Briguglio, responsible for European affairs. The programme includes the gathering of field data, the development of a geographical information system, and participation in European projects. Meanwhile, the Institute for Energy Technologies, attached to the university, is

working on the use of energy in the home and the use of renewable energy sources such as solar and wind power.

University makes the switch

Despite its limited resources, the university is the principal player in this new research activity. The most dynamic faculty, and one involved in many European projects, is engineering. "Traditionally, the best students have tended to go abroad for their doctorate. Having shown proof of the level attained, they are often our ambassadors who form the basis of present co-operation," explains Joseph Micallef.

So, research has taken off. "When I started my studies, nobody spoke about it," stresses Carl Debono of the Department of Communication and Computing, and the European contact for aerospace. "But it remains difficult to participate in international programmes because we do not yet have a sufficiently recognised reputation. We must convince our partners of our abilities."

This strength of conviction has been in existence since Malta became a partner in such diverse international projects as Twister (e-education), Flysafe (air safety) and Sensation

(sensor development). "One must admit that Europe is almost our key source of financing," says Michael Refalo. "At present, we have submitted 284 Maltese proposals to participate in projects under the Sixth Framework Programme, 62 of which have been accepted."

Nevertheless, researchers from both the private and public sector stress that European regulations for participation are ill-suited to the needs of the outlying Member States, due to the cumbersome procedures, scale of the projects financed, and only part financing. Brian Restall, national contact for the TIC and MCST, remains optimistic nonetheless. "Thanks to the quality of its infrastructures and the high level of education, our country will soon be competitive." ■

To find out more

- MCST
www.mcst.org.mt
- University - Faculty of Engineering
www.eng.um.edu.mt
- Mepa
www.mepa.org.mt
- Malta Enterprise
www.maltaenterprise.com

Aquabiotech Innovia, an aquaculture start-up

"We set up the company over the course of three months, in 2003, because one of our group's customers needed a research job done," remembers Shane Hunter, the young technical director of ABT Innovia,

a subsidiary of Aquabiotech (ABT), a Maltese consultancy company active in the field of aquaculture and aquatic technology and environments with customers worldwide today. Located at the Korbin business incubator, ABT Innovia employs a dozen researchers of all nationalities and welcomes foreign students via the European Leonardo programme. It is also a participant in the EU-backed AquaTNet research and education project.

To enter the laboratory you must remove your shoes and be disinfected, a ritual repeated at every door to avoid any risk of contamination. The laboratory carries out research on nutrition, medicines, nutraceuticals, and hatching and rearing techniques for various species of fish and crustaceans (from cod kept at 5°C to tropical specimens reared at over 35°C). A completely closed system of water filtration-

recirculation and total control of all the parameters avoids any contamination of the environment. "We have development projects but are totally self-financed. The local banks are not very interested in investing in science," explains Shane Hunter.

www.aquabt.com



Sparus aurata larva ©AquaBioTech Group



Nannochloropsis micro-algae ©AquaBioTech Group

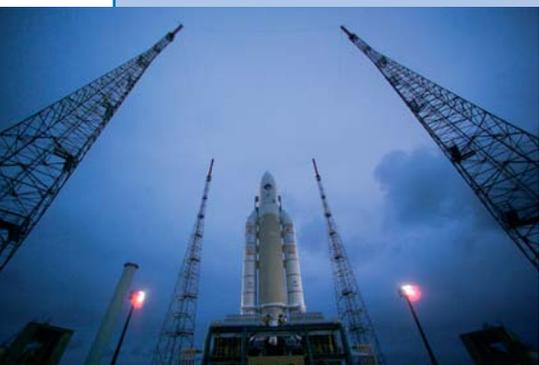


Brachionus zooplankton
©AquaBioTech Group

DISCOVER... DISCUSS... EXP

Corvaja's eye

Faces, landscapes, moments captured in a crowd, trees, towns... are just some familiar subjects for photographers. But for the Franco-Italian photographer Stéphane Corvaja, fascinated since childhood by space and the machines that explore it, the focus is very different. It all began when he happened to see a film and photographs of the Apollo missions. "I was seven years old and it had a big impact." Corvaja was enthralled by the immensity of the cosmos and the desire of men to explore and understand it. He decided to become a photographer and in 1989 joined the optical department of the space centre in Kourou, Guyana. This was a time of intense activity for Ariane, with eight missions a year taking 3 000 photos each time. Corvaja is very aware of how one launch can seem very much like another and the subtleties it takes to highlight what is, in fact, a unique moment. A certain angle, a certain light can make all the difference. Negotiating with the security services to be at the right place at the right time is also part of the job: "You have to be constantly on the alert and benefit from every instant to get the shot that makes the difference. You must be patient also. You have to get there early and leave late, or you miss a great deal."



Corvaja, currently Head of photography with the ESA, has just won the three first prizes in the space category awarded by the US magazine Aviation week & Space for the best photographs of 2004. Perhaps the most impressive of all is the full vertical shot of the Rosetta launcher, symbolic of so much promise for the future.

To find out more
 ● www.esa.int

Education corner

Southern research

Research, expertise, training: these three missions of the Institut de recherche pour le développement (IRD) make this French body a key partner for countries of the southern hemisphere, as well as an intermediary enabling teachers, researchers and the general public to learn more about these regions. Among other things, the IRD makes teaching packs available to teachers on a number of scientific topics of interest to much of the planet, such as volcanic activity, freshwater resources and emerging viral diseases.

Other topics permit a comparison between different parts of the world, such as an 'inventory of 19 cities' which provides insight into the urban phenomena – architecture, mentality of the inhabitants, public policy, segregation, etc. – in such contrasting cities as Sao Paulo and Moscow, Paris and Delhi, and Montreal and Johannesburg. The IRD also produces very clear and comprehensive science news sheets presenting the latest research on phenomena affecting mainly developing regions. One example is Lishmaniasis, a parasitic disease that affects half a million people every year and requires a hospital treatment that is difficult to provide in most of the regions where it is found. Recent research based on ethnopharmacological studies – carried out in particular by scientists at the CNRS (FR) and researchers at the IRD in South America – is now offering real prospects of progress.

The IRD also launched the Sida@pilote website on Aids which is designed for young people between 15 and 25. Giving them the opportunity to find answers to their questions, it provides a useful resource for finding out more about the state of research as well as exchanging information and practices. The site has rapidly broadened to fields outside of its initial theme to cover subjects such as poverty-related diseases, the environment, and ways of fighting this scourge. IRD also published *Sciences au sud*, a bi-monthly journal that reports on the institute's principal research work in a language that is easily understood by the non-specialist.



Leishmaniasis promastigote
 ©IRD/Christian Bellec

To find out more

(Bilingual French-English site, but with most documents in French)
 ● www.ird.fr

The dictionary of scientific culture

With 7 000 articles, 5 000 notices, 2 000 biographies, hundreds of illustrations, translations of all terms from the original French into English, and an interactive approach that takes you from one word to the next with numerous links for further exploration, the Dictionnaire interactif des sciences et des techniques is primarily designed for secondary school and university students, while offering special access for 'professionals' and the 'general public' (scientific culture). Published by Analogie, it is accessible on CD-ROM (€68) and via the internet, on payment of an annual

subscription of €25. Purchase of the CD-ROM brings automatic registration to personalised on-line services.

The dictionary "was born of the desire to apply to the field of science and technology the analytical method implemented by Paul Robert in the French language dictionary of the same name. The method involves the use of associations of ideas or analogies to enrich and link up the articles." Starting from a concept, it is possible to move to a wider context that lends a genuine cultural dimension to scientific knowledge.

To find out more

● www.sciences-en-ligne.com

L O R E . . . S U P P O R T . . . C O N S O R T . . .

Edible and combUSTible

In Valencia (ES), one in two municipal buses (200 vehicles) runs on used cooking oil. This is one of the innovations brought by the Ecobus project, supported by the Life-Environment programme. Vegetable oil collectors make a round of 600 establishments, visiting 528 cafés, restaurants and caterers, 42 hotels, 30 schools and hospitals. All these 'donors' display the Ecobus logo and receive a container. After collection and processing, these food oils are used in a diesel/ecodiesel mix in concentrations of between 5% and 30%. Regular and very strict checks are made on their emissions (CO, CO₂, HG, NOx, etc.) and performances, especially consumption. This pilot project is being studied from three angles: environmental effects, cost and profitability.

The operation's success owes much to a lively awareness-boosting campaign aimed at the city's inhabitants. The slogan is a play on words

which can be translated as 'used oils make combUSTible' – the latter meaning fuel. Information sessions were held in schools, posters placed in bus shelters, buses were painted in the Ecobus colours and exhibitions explained the usefulness of the operation. This prompted many possible 'donors' to come forward, yielding much more potential fuel (combUSTible!) than expected.

The project promoters' aims do not stop at the Valencia city limits, however. What proves a success here could also work elsewhere, mainly in the Mediterranean countries where vegetable oil is part of the culinary tradition.

To find out more

• www.ecobus.net



Recycle cooking oil... in an engine.

What proves a success here could also work elsewhere, mainly in the Mediterranean countries where vegetable oil is part of the culinary tradition.

A long-term exhibition

Einstein or the adventure of discovery

As well as being World Year of Physics, 2005 is also the 100th anniversary of the 'wonder year' (*annus mirabilis*), during which Albert Einstein published four major articles. The first, which earned him the Nobel Prize for physics in 1921, is a revolutionary analysis of light that he believed functioned both as a wave and a particle flow. The second, on the Brownian movement, provided theoretical proof of the existence of atoms and molecules. The third formalised the break with Newtonian physics by viewing space and time as relative. The fourth, on limited relativity, revealed the universally known formula of $E=mc^2$.

The exhibition at the Deutsches Museum traces the path of Einstein's scientific adventure through the intuitions, discoveries and studies that led to the development of the theory of relativity and quantum theory. The exhibition does not stop at Einstein, however, and also presents the new understanding of time, space and causality that was generated by his thinking. Einstein is still very present today, not only in the way we understand the universe, but also in fields such as laser technology and microelectronics, GPS and research into the atom. Although Einstein was cremated, his brain was conserved and analysed – but failed to reveal any special features!

"I am a loner with a love of humanity," said this genius who was very much a scientist of his age. The Munich exhibition shows how he saw himself in a historical context, was interested in politics and rejected convention and accepted ideas ("it is more difficult to destroy a prejudice than an atom"). Suffering from dyslexia as a child and considered to be a bad influence, he left college to prepare on his own for the entrance exam to the already famous Zurich polytechnic. His first job was at the Berne patents office whose limited demands on his energies left him free to explore his ideas. A Jewish pacifist in 1930s Germany (when he was President of the Human Rights League), he left for the United States under Nazism, becoming a US citizen in 1940. Ben Gourion had asked him to be President of Israel but he viewed the challenge as impossible: "without the honest co-operation of the Arabs there can be neither peace nor prosperity".

He is also known for his love of the violin, low regard for women, and flair for a well-turned phrase – many of which can be found today on numerous internet sites. To cite just one: "Coincidence is God incognito".

The Adventure of Discovery.
Albert Einstein and 20th Century Physics.
Deutsches Museum - Munich
7 May to 31 December 2005

To find out more

• www.deutsches-museum.de
• www.deutsches-museum.de/ausstellung/sonder/e_einstein.htm

The CIRS: a portal to science

Four languages open the doors to research: English, Spanish, French and Arabic. The information and links are gathered by the International Centre for Scientific Research (CIRS) which describes itself as "the only public utility service, entirely free and open to all, providing scientific information at the international level". The information is organised into very clear 'chapters' in the form of brief texts reporting scientific news, information on researchers (prizes, discoveries), references to newspapers and scientific works, and links to scientific organisations, science academies, universities, research centres and specialised libraries. The CIRS operates in 'real time' at global level, continuously updating its database and drawing on a worldwide network of partners for input. Information on all research subjects is welcome, in all fields and in all languages, the sole condition for inclusion being "to have a purely scientific activity". The aim is to facilitate access to information sources of a nature to assist experts, researchers, students or simply those who are curious about science.

Access in English, French, Spanish and Arabic. Choose your language on www.cirs.net.



Albert Einstein and Oskar von Miller, Founder of the Deutsches Museum, Berlin, 1930.

REFERENCE POINTS... REFERENCE POINTS...

A charter for researchers

Who are researchers? "Specialists working on the conception or creation of new knowledge, products, processes and systems and on the management of the projects concerned." This commonly accepted definition covers all those who, in one way or another, are engaged in R&D – from fundamental to applied research, and including teaching and innovation. Whatever their speciality or status, many of these researchers share a sense of unease, sometimes openly expressed to the authorities in the various European countries. They stress their fragile status and careers, the temporary contracts, the poor rewards, the reduced public funding in many areas, and the time they are forced to spend on related activities such as management, the search for funds or consultancy. It is the combination of all these causes of discontent that is resulting in a lack of interest in research careers. It is also a situation that flies in the face of the Union's stated aim of awarding priority to a knowledge-based society, technological innovation, and human resources and intelligence at the heart of global competition.

To help resolve these contradictions, in March the Commission published a recommendation to encourage observance of the new European Charter for Researchers and Code of Conduct for the Recruitment of Researchers. The charter comprises "a set of general principles and requirements which specifies the roles, responsibilities and entitlements of researchers and their employers or funding organisations." It covers prospects for the development of 'sustained' careers, measures to encourage and facilitate mobility based on a coherent policy, and the implementation of recruitment procedures that are open, transparent

and equal in terms of gender and ethnic origin. The Commission also stresses the importance of social security coverage – in particular, the transfer of pension rights from one country or one employer to another, which is often a very restricting obstacle to mobility. A number of articles confirm the importance of research freedom, ethical principles and professional responsibility, while others deal with good practices, career structures, the dissemination of results, and the moral commitment of researchers to society, in particular in bringing their work to the attention of the greatest number of people.

The recommendations addressed to employers concern recognition of the profession and wages, non-discrimination and working conditions (especially reconciling work and family life). The need for a "representative gender balance at all levels of staff, including at supervisory or managerial level" is given particular emphasis. Research training at all stages in a career, intellectual property rights, and the role of teaching (in evaluation systems, for example) are all included. Finally, the code of conduct requests that account be taken of mobility experience and a varied career.



To find out more

● europa.eu.int/eracareers/europeancharter

Research in the draft EU Constitution

What is new as regards research policy in the Treaty on the EU Constitution that the Member States are now being asked to ratify? First, there is the restating and overall clarification of the basic principles concerning this area of EU competence. In addition, a number of new elements have been introduced.

The concept of the European Research Area (ERA) is defined as the real basis on which the objectives are reaffirmed: the dissemination of knowledge, the development of global and industrial competitiveness, and a response to research needs in the Union's policies as a whole. All these actions continue to be incorporated in the multi-annual



Framework Programmes – adopted by co-decision between the Council and European Parliament – which set out clearly the aims and the means, while allowing sufficient flexibility to respond to changing circumstances. This linchpin of research policy covers co-operation in implementing specific programmes, the opening up to international partners, the dissemination and exploitation of results, and the training and mobility of researchers.

In addition to strengthening coherence and co-operation within the ERA, Article III-250 states that the Commission's action can take the form of launching and participating in initiatives to coordinate Union and Member States'

policy, with the European Parliament being kept fully informed. Another Article (III-252) introduces the possibility of the Union participating in supplementary programmes undertaken by Member States. Finally, Article III-253 makes provision for the creation of joint undertakings.

To find out more

The new provisions of the Constitution are dealt with in Part III ("The procedures and functioning of the Union") – chapter III ("Policies in other areas"). Research is included under section 9 of this chapter, from articles III-248 to 253. Articles 254 and 255 of this section define the principles of space policy.

General site on the new Constitution:

● europa.eu.int/constitution/

Site to download part III:

● europa.eu.int/constitution/download/part_III_en.pdf

REFERENCE POINTS... REFERENCE POINTS...

Communicating European Research (CER)

The first CER meeting, in 2004, proved a big success, attracting 500 participants, including 120 journalists from 28 countries. Scientists, researchers, media players and communication professionals were able to compare their 'worlds' and learn a little bit more about each other. Speeches, debates, presentations of experiences and good practices, as well as more informal meetings enabled a better mutual understanding of the issues involved in communicating science. In particular, they discussed ways in which research can convey its message to various audiences without falling victim to an oversimplified popularising of science.

The second CER meeting will be held on 14 and 15 November 2005. Once again the worlds of research and of communication will have the opportunity to explore the essential themes on which the two can establish a common understanding. They will exchange best practices, jointly define strategies, and look at ways of communicating research results to the public in general and to the press in particular. Parallel sessions will focus in particular on the successes and failures of communication, new trends, relations between science and the media (TV, radio, written press), scientific journalism, and science in schools.

European research will also be showcased in a number of ways, including the presentation of progress being made by current European research and scientific projects, and an exhibition of initiatives from the worlds of communication and of research.

In addition to the programmed activities, a forum will give participants the opportunity to draw on their own creativity by proposing events such as round tables, workshops and social events.

The two-day meeting will end with a presentation of the Seventh Framework Programme, which will start in 2007.



To find out more

(announcement, programme, registration, participants forum, etc.):

● www.europa.eu.int/comm/research/cer2005.html

RESEARCH FLASHES

Infrastructures

What new infrastructures are needed for European research? That is the question being posed by the European Strategy Forum on Research Infrastructures (ESFRI) which, at the beginning of April 2005, presented a list of '23 opportunities' covering astronomy and astrophysics, nanotechnologies, material physics, biology and biomedicine, the applications of supercomputers, the environment and the social and human sciences.

europa.eu.int/comm/research/press/2005/pr0704en.cfm

Researchers and the public

As part of its efforts to bring researchers closer to the general public, the Swedish association Vetenskap och Allmänhet (VA) proposes two documents, which can be downloaded in English, presenting the results of surveys carried out in the country: *How Researchers View Public and Science* (2003), and *How Teachers View Science* (2004). Although limited geographically to Sweden, these reports are nevertheless highly revealing and could inspire similar surveys in other countries. One notable point is that few researchers believe that their work is of any real interest to the general public. But there is some good news, too: one teacher in two notes a growing interest in science among school pupils.

http://www.v-a.se/eng_about.asp?menulitem=1

Women and Science

The Women and Science Unit at the Research DG has presented a new publication entitled *Women and Science: Excellence and Innovation - Gender Equality in Science*. This provides an overview of all actions undertaken under the aegis of the EU since 2001, as well as those currently being prepared, plus extensive figures on the role of women in research in the different EU countries. Of particular note is that out of the budget of €20 million allocated to the Women and Science action by the Sixth Framework Programme; the 2005-2006 instalment amounts to €5.7 million. Of this, €2 million will be allocated to the European platform of women scientists whose goal is to organise a network involving all individuals and organisations working to achieve gender equality in this sector. The Commission is also proposing the creation of an award for best gender research.

europa.eu.int/comm/research/science-society/women-science/women-science_en.html

Biological weapons

Two US scientists, Margaret Sommerville and Ronald Atlats, propose a nine-point ethical code for research in the life sciences. Their principal concern is to limit access to biological agents that could be used for the purposes of war – and, of course, for acts of bioterrorism.

Reference : *Science*, 307, 1881
www.scienceline.org/

Letters

Speaking of men

For personal reasons, I have been interested in gender inequalities for over a decade. I have long been convinced that questions of violence cannot be reduced to what is written in most newspapers and I am grateful to you for having presented the problem⁽¹⁾ in a way that I have never encountered on the part of any defender of 'equality' between men and women. The paragraph entitled 'the aggressors as victims' seems in particular to indicate the key to progress on this issue of which we only ever see (is this deliberate?) the tip of the iceberg: to put it briefly (and in rather simplified terms), violence against women is unacceptable (everybody agrees) and violence against men is ... invisible and thus not acknowledged and is therefore (perfectly) accepted. Recognising this may be the first step to changing attitudes in the future.



Louis-Victor Bril, Joint Research Centre – Ispra (IT)
(1) RTD info 44, *What makes a man?*

REFERENCE POINTS... REFERENCE POINTS...

Transatlantic bridges

There are around 100 000 European researchers based in the United States. The pessimistic see this as one-way traffic in our best brains. But another way of looking at them is as 'bridgeheads' who are well placed to help establish interesting forms of co-operation. To make sure these exiles retain their links with Europe, the Commission has set up the ERA-Link system. First, the network contacted 2 000 researchers of 33 nationalities residing in the United States (39% postdoctorates, 28% confirmed researchers, the majority being biologists and chemists) to establish their 'relationship with Europe'. About 13% of them are members of an international science and technology network and while almost 50% have experience of local co-operation with other European researchers, many want to establish links of this kind with scientific organisations on their home continent. They are interested in financing and research opportunities in Europe, especially those connected with EU programmes.

However, they appear to be badly informed: only 18.4% of them have heard of the European Research Area and just 13.7% of the mobility portal for researchers. Although 51% have retained links with their home country and know how to seek employment there, that is not the case for other EU regions – 90% say they would like to be informed of career possibilities in all the EU countries.

ERA-Link plans to launch a pilot network designed to meet all these needs. The initiative was presented at the American Association for the Advancement of Science (AAAS) conference, which was held in Washington on 18 February.⁽¹⁾

To find out more

ERA-Link and the survey results

● eurunion.org/legislat/STE/STHome.htm

(1) This annual event concentrated in particular on EU research, at the various joint EU-US symposiums on questions of shared interest (research evaluation, science communication, career promotion, risk-taking in research, etc.).



Canada and the mobility portal

Another example of a virtual link over the ocean is the mobility portal for researchers concerning Canada. This on-line service is designed to enable European students and researchers to learn about opportunities in Canada and vice versa. The portal is a section of the scientific co-operation site set up by the Canada Mission to the European Union at the time of the Sixth Framework Programme launch.

To find out more

Site of the Canada Mission

● www.infoexport.gc.ca/science/eu_home-en.htm

Mobility portal

● <http://europa.eu.int/eracareers>



Ormala report: EU X-ray research

The Five-Year Assessment Report, published in February 2005, is certainly recommended reading. This document takes a close look at the successes and difficulties in implementing European research policy between 1999 and 2003, as well as at the lessons to be learned for the present and future. Chaired by Erkki Ormala, Vice-President, responsible for technology policy with the Nokia Group, 13 experts from very diverse backgrounds

participated in this remarkable fact-finding exercise, sounding out the many key players, and presenting structured reflections. In the report they scrutinise both the strengths and weaknesses of the European Research Area in the context of the rapid changes to the contemporary socio-economic, scientific and technological landscapes. They also provide a pragmatic examination of the implementation of EU action, and conclude with a set of very interesting fundamental recommendations. The next issue of RDT info will take an in-depth look at the report's analyses and findings.

To find out more

● europa.eu.int/comm/research/reports/2004/pdf/fya_en.pdf

The price of water

Every year, the Stockholm Water Prize is awarded to institutions or individuals who have achieved progress on the vital issue of water (research, management, etc.). Worth \$150 000, this year's award goes to the Centre for Science and Development (CSE). This Indian non-governmental institution, located in New Delhi, has worked intensively on installing reservoirs, water storage systems, irrigation reservoirs, drinking water, etc.

To find out more

● www.scidev.net

REFERENCE POINTS... REFERENCE POINTS...

Sinapse: register in the 'Yellow Pages' of scientific expertise

"It is essential for the most pertinent and most recent scientific knowledge to be brought to the attention of decision-makers, at European and national level," declared Janez Potočnik, European Commissioner responsible for research, on the subject of the launch of the Sinapse (Scientific INformation for Policy Support in Europe) network. Political choices – in terms of energy, the environment, public health, etc. – must be based on a good evaluation of the knowledge provided by scientific expertise. Initiated by the Commission, this new communication platform is available to governance, the scientific community itself and also to the general public in search of information.

Sinapse is principally aimed at any individual or organisation (universities, science academies, research centres, individual scientists, etc.) with expertise that could prove useful in defining or implementing policy, as well as all those interested in the use of science in the political decision-making process.

Its principal function is to provide an increasingly comprehensive index of organisations and individuals with scientific and/or political expertise and to facilitate communication between them and the decision-makers. In this way, Sinapse should, on the one hand, allow policy-makers to

consult more widely and, on the other hand, enable more players to express their opinions and share their knowledge. The intention is not to replace existing advisory mechanisms but to reinforce them by providing an additional means of collecting information useful to their work.

Various communication tools are proposed: a library of scientific opinions, with immediate circulation of the posted documents to members interested in the fields in question; a tool enabling the Commission services to consult members likely to possess the expertise sought; and an early-warning system and module enabling members to create discussion and exchange groups.

Sinapse is currently at its registration stage with the aim of progressively creating the widest possible community of interest. More than 200 organisations, including key players in the scientific community, are already members.⁽¹⁾ The success of this type of network is nevertheless based on having a broad base and any scientist/expert or organisation who would like to join is invited to register and also to encourage interested contacts or networks to do the same.

(1) The full list can be accessed on the site's Yellow Pages module.

To find out more

Sinapse is available free of charge and is open for registration at:

● <http://europa.eu.int/sinapse>

Opinion

Science-society: a plea for transparency

In order to create a more research-friendly society, one in which research and innovation become embedded in society and which is an expression of "the capacity to aspire", as Arjun Appadurai has called the capacity of culture to orient itself to the future and to navigate towards it⁽¹⁾, we have to explain what research is and how the process of research is actually carried out. We have to explain the wider societal, political, economic and cultural context in which research has the impact on society that it does and how these forces impinge and shape research. Instead of presenting spectacular products and results, we need to focus more on the processes of research, on the inherent uncertainty which is part and parcel of it, on how bottom-up and top-down approaches intersect, on the actual, and not only the idealised, role that users play and how research funding agencies work, both at national and supra-national level. We should explain how

research priorities are set, since it is not Nature whispering into the ears of researchers which problem they should address next, but an intricate mixture of opportunities and incentives, of prior investments and of strategic planning mixed with subversive contingencies. But science and scientific institutions also need to open up to becoming much more aware of the expectations, contradictions and constraints that exist on the part of society, yet willing to join, without manipulating, the strengthening of the capacity to aspire. Innovation is the collective bet on a common fragile future and no side, neither science nor society, knows the secret of how to cope with its inherent uncertainties. It has to be done in some sort of alliance and with a shared sense of direction.

This would also enable us to better explain to the wider public the difference between claims or promises made on the part of researchers, depending on whether or not these claims have been peer-reviewed. How can the public get to know about these rules that play such an important part for the scientific community, noting their significance as well as their limitations, unless we explain how they actually work? And how can they know about

the differences in scientific cultures, what counts as evidence, or how consensus is reached with criticism being an essential precondition for moving towards it, if nobody tells them? The list goes on and on. It may sound like tedious bean-counting to you, but the goal will have been achieved once our audience has understood what we actually do inside our universities and departments, inside our research councils and other funding agencies, inside the national as compared to the EU policy-making circles and inside industry and academia. And by its sheer complexity, this kind of bean-counting and the stories that evolve around it will become interesting to our audience. Moving between high-cost and low-cost realities, maybe we need to find a new market segment, that of medium-cost reality.

Helga Nowotny,

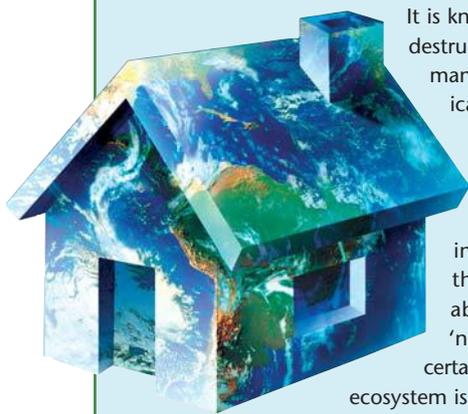
President of Eurab (European Research Advisory Board of the European Commission)

http://europa.eu.int/comm/research/eurab/index_en.html

(1) Appadurai, Arjun (2004), "The Capacity to Aspire: Culture and the Terms of Recognition". In: Vijayendra Rao and Michael Walton (eds.) *Culture and Public Action*, Stanford: Stanford University Press, 59-84.

RED ALERT for ecosystems!

"Human activity exercises such pressure on the planet's natural functions that the ability of ecosystems to meet the demands of future generations can no longer be taken for granted." This warning is taken from the *Overview of Millennium Assessment Reports*, produced under the aegis of the Institute of Advanced Studies at ONU University (Tokyo) and drawing on the findings of 1 300 experts from 95 countries. The report analyses in particular the services rendered by ecosystems that play a key role in the sustainability of the biosphere, such as oceans, the savannah, the tropical forest and the polar ice caps. These natural environments are essential generators of our water, food and biodiversity resources, and indirectly constitute the necessary conditions for the well-being of humanity.



It is known, for example, that the destruction of 35% of the world's mangroves (flooded forests typical of tropical environments

which are very rich ecosystems) has increased the impact of tsunamis on which they had a moderating influence. In particular, there is growing concern about what are known as 'non-linear changes': from a certain degradation threshold, an ecosystem is not only impoverished but

unable to function. Some species of fish, for example, are so depleted that they can no longer be fished.

The study reaches four major conclusions:

- man has modified ecosystems more quickly over the past 50 years than ever before in his history;
- the gains in terms of well-being and economic development have been to the detriment of the other 'services' provided by ecosystems;
- this degradation is likely to get worse and jeopardise realisation of the Millennium Objectives for Development; and
- some scenarios involving significant changes to political choices could reverse this tendency.

This report is just the first step in a vast research project – lasting four years and with a budget of \$21 million – making an in-depth assessment of the degradation of ecosystems and their impact on human well-being. Other reports and technical works are in progress. The initiative is the result of a partnership between UN bodies, international scientific organisations, and development bodies, in consultation with the private sector and civil society. The Global Environment Fund (GEF), the United Nations Foundation, the David and Lucile Packard Foundation, and the World Bank are among its principal financial supporters.

To find out more

- www.maweb.org
- www.millenniumassessment.org

Diary

The following list is a selection of events announced for May to July 2005

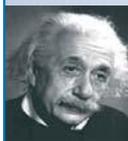
On-line access for a full list and updates

europa.eu.int/comm/research/headlines/archives_diary_en.html

- **Energy for Life – European Energy Strategy for the 21st Century**
Nuclear Energy and European Energy Policy – 22-24/05/2005 – Prague (CZ)
www.foratom.org/Content/Default.asp?PageID=772
- **North Sun 2005 – Solar Energy for High Latitudes** – 25-27/05/2005 – Vilnius (LT) – www.northsun.org/
- **Model IT 2005 – Modelling Applications and Innovative Technology in the Agri-Food Chain** – 29/05-02/06/2005 – Leuven (BE) – www.agr.kuleuven.ac.be/ae/vcbt/model-it/
- **Biophysical Chemistry Meets Molecular Medicine** – 1-4/06/2005 – Sesimbra (PT) – www.ycw.fc.ul.pt/
- **IPSI – Exchange of new ideas in science** – 2-5/06/2005 – Belgrade (YU) – <http://belgrade.internetconferences.net/>
- **PVBA 2005 – Plant-Based Vaccines and Antibodies** – 8-10/06/2005 – Prague (CZ) – www.meetingsmanagement.com/pbva_2005/
- **SAFE 2005 – First International Conference on Safety and Security Engineering** – 13-15/06/2005 – Rome (IT) – www.wessex.ac.uk/conferences/2005/safe05/index.html
- **STREMAH 2005 – 9th International Conference on Structural Studies, Repairs and Maintenance of Heritage Architecture** – 22-24/06/2005 – Malta (MT) – www.wessex.ac.uk/conferences/2005/str05/index.html
- **CARS 2005 – Computer Assisted Radiology and Surgery 19th International Congress and Exhibition** – 22-25/06/2005 – Berlin (DE) – www.cars-int.de/
- **Public communication of science and technology** – 22-23/06/2005 – Beijing (CN) – www.pcstnetwork.org/
- **18th International Conference on Industrial and Engineering Applications – Artificial intelligence and knowledge-based systems** – 22-25/06/2005 – Bari (IT) – www.di.uniba.it/iea-aie/index.html
- **Autex – World Textile Conference 2005** – 27-29/06/2005 – Portoro (SI) – autex2005.fs.uni-mb.si/body_index.html
- **JENAM (Joint European and National Astronomy Meeting) 2005 Distant Worlds** – 04/07/2005 – Liège (BE) – www.astro.ulg.ac.be
- **R&D Management Conference – Organising R&D Activities: A Balancing Act - 6** – 8/07/2005 – Pisa (IT) – www.radma.org/
- **Society for Experimental Biology Main Meeting** – 11-15/07/2005 – Barcelona (ES) – www.sebiology.org/Meetings/pageview.asp?S=2&mid=&id=19
- **21st International Conference on the History of Cartography Changing borders** – 17-22/07/2005 – Budapest (HU) – lazarus.elte.hu/~zoltorok/ichc/ichc2005.htm
- **Albert Einstein Century International Conference – World Year of Physics** – 18/07/2005 – Paris (FR) – einstein2005.obspm.fr/indexr.html
- **12th International Conference on Artificial Intelligence in Education** – 18-22/07/2005 – Amsterdam (NL) – hcs.science.uva.nl/AIED2005/
- **Knowledge, Culture and Change in Organisations** – 19-22/07/2005 – Rhodes (GR) – managementconference.com/
- **25th European Meeting of Statisticians** – 24-29/07/2005 – Oslo (NO) – www-m4.mathematik.tu-muenchen.de/m4/erc/#25EMoS



©ESA



Research DG publications

The following is a selection of works published by the Research DG.
On-line access for a full list:

europa.eu.int/comm/research/publications/pub_en.cfm

Research policy

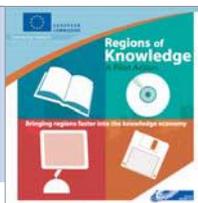


Converging Technologies for a Diverse Europe

Conference report – Eur: 21356
ISBN: 92-894-8312-1 – A4/32 p.
Published: 2005/1
research@cec.eu.int

Regions of Knowledge A pilot action bringing regions faster into the knowledge economy

Brochure – ISBN: 92-894-8728-1
44 p. – Published: 2005/2
rtd-knowreg@cec.eu.int



Women in industrial research

Speeding up changes in Europe – Conference report
ISBN: 92-894-8318-0 – A4/67 p – Published: 2005/1
research@cec.eu.int

CREST report on the application of the open method
of coordination in favour of the Barcelona research
investment objective – Report – ISBN: 92-894-8480-2 – A4/50 p.
Published: 2004/12 – rtd-omc@cec.eu.int

Science and society

Today's science for tomorrow's society 26 examples of actions under the Science and Society programme – A4/52 p.

Published: 2005/3
rtd-scienceandsociety@cec.eu.int



Raising public awareness of science and technology A review of actions in the Fifth Framework Programme (1998-2002)

Brochure – ISBN: 92-894-6332-X – A4/31 p.
Available in EN, FR, DE – Published: 2005/1
rtd-scienceandsociety@cec.eu.int

Energy

Towards the European Energy Research Area

Report – Eur: 21353 – ISBN: 92-894-7744-5
B5/96 p. – Published: 2005/2 – rtd-energy@cec.eu.int

Assessing the impact of energy research
Report – Eur: 21354 – ISBN: 92-894-7325-8
A4/36 p. – Published: 2005/2
rtd-energy@cec.eu.int



Key tasks for future European Energy R&D

Report – Eur: 21352 – ISBN: 92-894-8750-X
A4/88 p. – Published: 2005/2 – rtd-energy@cec.eu.int

A Vision for Photovoltaic Technology

Brochure – Eur: 21242 – ISBN: 92-894-8004-1
A4/48 p. – Published: 2005/1
rtd-energy@cec.eu.int

European Fusion research Area – Brochure

ISBN: 92-894-8157-7 – A4/64 p.

Published: 2005/1 – rtd-energy@cec.eu.int



Environment



EU Research for Sustainable Earth

Observation – Brochure
Eur: 214578 – A4/20 p.
Published: 2004/12
rtd-sustainable@cec.eu.int

Medicine & Health

EU-supported research into major diseases

Moving towards healthier horizons – Brochure – A4/6 p. –
Published: 2005/2 – research@cec.eu.int

Project presentations

ERA-NET – Coordination of national research programmes

Description of 25 projects (2nd series)
ISBN: 92-894-7998-1 – A4 / 50 p.

Available in EN, FR, DE – Published: 2004/11
rtd-coordination@cec.eu.int



New and Emerging Science and Technology

Description of 25 projects
(2nd enlarged edition)
ISBN: 92-894-8684-8 – A4/50 p.
Published: 2004/11
rtd-nest@cec.eu.int

SSP (Scientific Support to policies):

85 projects to help policy-makers reach decisions
http://europa.eu.int/comm/research/fp6/ssp/index_en.htm

International Co-operation in Food, Agriculture and Biotechnology Research – Description of 17 projects

A4/50 p. – Published: 2005/1
Elisabetta.Balzi@cec.eu.int



Recommended virtual visits

EU Genomics news No.3 - 12.2004

Newsletter: the latest news on European projects and networks in the field of
fundamental genomics

[www.europa.eu.int/comm/research/health/genomics/newsletter/issue3/
newsletter1_en.htm](http://www.europa.eu.int/comm/research/health/genomics/newsletter/issue3/newsletter1_en.htm)

RENEWS No.3 - 02.2005

Newsletter – Examples of research on renewable energies

www.europa.eu.int/comm/research/energy/pdf/renews3.pdf

SusDev News No.3 - 02.2005

Newsletter – Research projects on sustainable development

www.europa.eu.int/comm/research/environment/newsanddoc/newsletter_en.htm#2

SME update No.13 - 03.2005

Newsletter – Encouraging the participation of SMEs in European research
programmes

http://sme.cordis.lu/docs/news_13_en.pdf

Site of the Luxembourg presidency (1st half of 2005) – www.eu2005.lu

Overview of calls for proposals

Here is the latest news on the nature, closing dates and indicative budgets of calls for proposals already launched or scheduled for the coming months (valid beyond 15 May). For additional specific information on each of these calls, go to the page indicated on the Europa site which provides direct links to the on-line documents and procedures available on the CORDIS server.

europa.eu.int/comm/research/fp6/calls_en.html

Abbreviations used – IP: Integrated Projects – NoE: Networks of Excellence – STREP: Specific Targeted Research Projects – CA: Coordination Actions – SSA: Specific Support Actions – Nd: not determined

CALL IDENTIFIER	RESEARCH FIELDS OR ACTIONS TARGETTED	CLOSING DATE	INDICATIVE BUDGET (IN MILLION €)
INTEGRATING AND STRENGTHENING THE EUROPEAN RESEARCH AREA			
Information society technologies		ist@cec.eu.int	
FP6-2002-IST-C	Call open (until 2006) for STREP, CA, SSA in future and emerging technologies (FET) ⁽¹⁾ <i>(1) see: www.cordis.lu/ist/fet/int-o.htm – (2) Forthcoming evaluation dates: 14/02/2006 (3) Global budget 2005</i>	20/09/2005 ⁽²⁾	60 ⁽³⁾
Nanotechnologies and nanosciences, multifunctional materials and new production processes and devices		rtd-nmp@cec.eu.int	
FP6-2004-NMP-NI-4	Thematic call for IP. Fields: targeted drug delivery – nanostructured porous materials – ultra-precision engineering micro-devices – flexible technologies and assemblies – multifunctional material-based production centres, new construction processes and products – environmental biotechnologies	15/09/2005 ⁽¹⁾	150
FP6-2004-NMP-TI-4	Thematic call for STREP, CA, SSA. Fields: converging technologies – standardisation for nanotechnology – nanobiotechnologies (using nature as a model), creation of materials (three-dimensional nanostructures based on elements other than carbon) – interaction of engineered nanoparticles with the environment and the living world – fundamental knowledge of materials (interfacial phenomena, advanced characterisation tools, computational modelling of multifunctional materials) – advanced processing of multifunctional materials, new multifunctional ceramic fine films	15/09/2005	120
FP6-2004-NMP-SME-4	Thematic call for IP proposed by SMEs. Fields: multifunctional textiles for construction, medical applications and protective clothing – engineering and production of integrated components for the transport sector, materials for implants – nano security systems <i>(1) Open only to proposals submitted during first phase</i>	15/09/2005 ⁽¹⁾	100
Aeronautics and Space		rtd-aerospace@cec.eu.int	
FP6-2002-Aero-2	'Aeronautics' open call for SSA. Fields: participation of SMEs – international co-operation – new countries – exploitation of results – objectives of the ERA – EU strategy and support for aerospace policy. Final closing date March 2006	30/06/2005 ⁽¹⁾	7 ⁽²⁾
FP6-2005-Aero-1	'Aeronautics' periodic call. Fields: strengthening competitiveness – environmental impact – safety and security – operational capacities	13/07/2005	245 ⁽³⁾
FP6-2005-Space-1	'Space' thematic call: GMES and satellite telecommunication systems (especially convergences with GMES and Galileo) <i>(1) Next evaluation date in 2005: 20/10/2005 (2) 2002-2006 budget (3) IP and NoE: €127 M – STREP and CA: €118 M (4) IP: €38.5 M – STREP, CA and SSA: €6.5 M</i>	13/07/2005	45 ⁽⁴⁾
Food quality and safety		rtd-food@cec.eu.int	
FP6-2003-Food-3-C	Open call for SSA. Fields: participation of SMEs, international co-operation, participation of new countries – preparation of technology platforms – support for EU policies – exploitation of results, scientific and organisational project management	07/09/2005	5
Sustainable development, global change and ecosystems		rtd-sustainable@cec.eu.int	
FP6-2005-Transport-4	Thematic call "Sustainable surface transport". Fields: New technologies and concepts (rail, road, waterborne) – advanced design and production techniques	01/09/2005	150 ⁽¹⁾
FP6-2002-Transport-2	Periodic call for SSA. Fields: participation of SMEs – international co-operation – new countries – exploitation of results – objectives of the ERA and EU strategy and support for policy in the field of "sustainable surface transport". Final closing date in March 2006 <i>(1) IP and NoE: €90 M – STREP and CA: €60 M</i>	01/09/2005	5
Horizontal research actions including SMEs		research-sme@cec.eu.int	
FP6-2004-SME-COLL	Periodic call: joint research projects (1 st phase)	26/05/2005	65
FP6-2004-SME-COOP	Periodic call: co-operative research projects	14/09/2005	75

CALL IDENTIFIER	RESEARCH FIELDS OR ACTIONS TARGETTED	CLOSING DATE	INDICATIVE BUDGET (IN MILLION €)
	Specific support measures for international co-operation	inco@cec.eu.int	
	<i>Abbreviations: DEV: developing countries – MPC: Mediterranean partner countries – Russia + NIS: Russia and the other Newly Independent States – WBC: Western Balkan Countries</i>		
FP6-2004-INCO-DEV-3	Thematic call for STREP and CA for the DEV. Fields: health – care systems – neglected transmissible diseases – rational use of natural resources – arid and semi-arid ecosystems – food safety – bio-diverse, bio-safe and value-added crops – aquaculture	13/09/2005	60
FP6-2004-INCO-MPC-3	Thematic call for STREP and CA in the MPC. Fields: environment – renewable energies - health	13/09/2005	10
FP6-2002-INCO-DEV/SSA-1	Periodic call for SSA in the DEV. Fields: health – natural resources – food safety	07/09/2005 ⁽¹⁾	2 ⁽²⁾
FP6-2002-INCO-MPC/SSA-2	Periodic call for SSA in the MPC. Fields: environment – cultural heritage – health	07/09/2005 ⁽¹⁾	0.9 ⁽²⁾
FP6-2002-INCO-Russia+NIS/SSA-4	Periodic call for SSA in Russia + NIS. Fields: adaptation of industrial production and communication systems – environment – health	07/09/2005 ⁽¹⁾	0.8 ⁽²⁾
FP6-2002-INCO-COMultilaRTD/SSA-5	Period call for SSA in the framework of the multilateral coordination of national RTD policies and activities	07/09/2005 ⁽¹⁾	1.5 ⁽²⁾
	<i>(1) Forthcoming pooled intermediary assessment dates: 07/09/2005 - 06/03/2006</i>		
	<i>(2) Budget for 2005</i>		
	Support for coordination activities	rtd-coordination@cec.eu.int	
FP6-2002-ERA-NET/1/CA-SSA	Periodic call: support for co-operation and coordination of research activities at national and regional level (ERA-NET system)	04/10/2005	38.6 ⁽¹⁾
	<i>(1) For 2005</i>		

STRUCTURING THE EUROPEAN RESEARCH AREA

Research and innovation	rtd-innovation@cec.eu.int		
FP6-2004-INNOV-7	Call for SSA: new methods to promote and stimulate the transnational transfer of technologies	15/06/2005	10.5
FP6-2004-KNOW-REG-2	Call for CA. Field: Regions of knowledge (promotion of co-operation between regions)	19/05/2005	8.95
Human resources and mobility (Marie Curie Actions)	rtd-mariecurie-actions@cec.eu.int		
FP6-2004-Mobility-3	Call for host fellowships for the transfer of knowledge	18/05/2005	45 ⁽¹⁾
FP6-2005-Mobility-11	Idem: Marie Curie European reintegration grants	19/07/2005 ⁽³⁾	10 ⁽²⁾
FP6-2005-Mobility-12	Idem: Marie Curie international reintegration grants	19/07/2005 ⁽³⁾	10 ⁽²⁾
FP6-2005-Mobility-4	Marie Curie conferences and training programmes	18/05/2005	12.25
	<i>(1) €30 M for Marie Curie development scheme and €15 M for university/enterprise partnerships</i>		
	<i>(2) Indicative budget for 2005 – (3) Forthcoming assessment dates: 19/10/2005</i>		
Science and society	rtd-sciencesociety@cec.eu.int		
FP6-2004-Science-and-society-13	Call for CA and SSA: Science and society beyond the FP6 (organisation of events)	24/05/2005	2.2

RESEARCH AND TRAINING IN THE FIELD OF NUCLEAR ENERGY

		rtd-euratom@cec.eu.int	
Euratom Call Open	Open call for SSA and for actions to promote and develop human resources and mobility: grants, training and international access to infrastructures	11/10/2005 ⁽¹⁾	3 ⁽²⁾

(1) Forthcoming closing dates: 11/04/2006 – (2) €3 M per closing date in 2005, including a maximum of 50% for research on energy fusion and €1.5 million for the management of radioactive waste, radiological protection and other activities

Request for free subscription to RTD info

You can subscribe free of charge to the magazine at
<http://europa.eu.int/comm/research/rtdinfo/rtd-adr.html>

You can also complete this coupon in block capitals and return it to the following address:

RTD info
 ML DG1201
 Boîte postale 2201
 L-1022 Luxembourg

Name:

Organisation:

Language version(s) desired*:

French English German

Address:

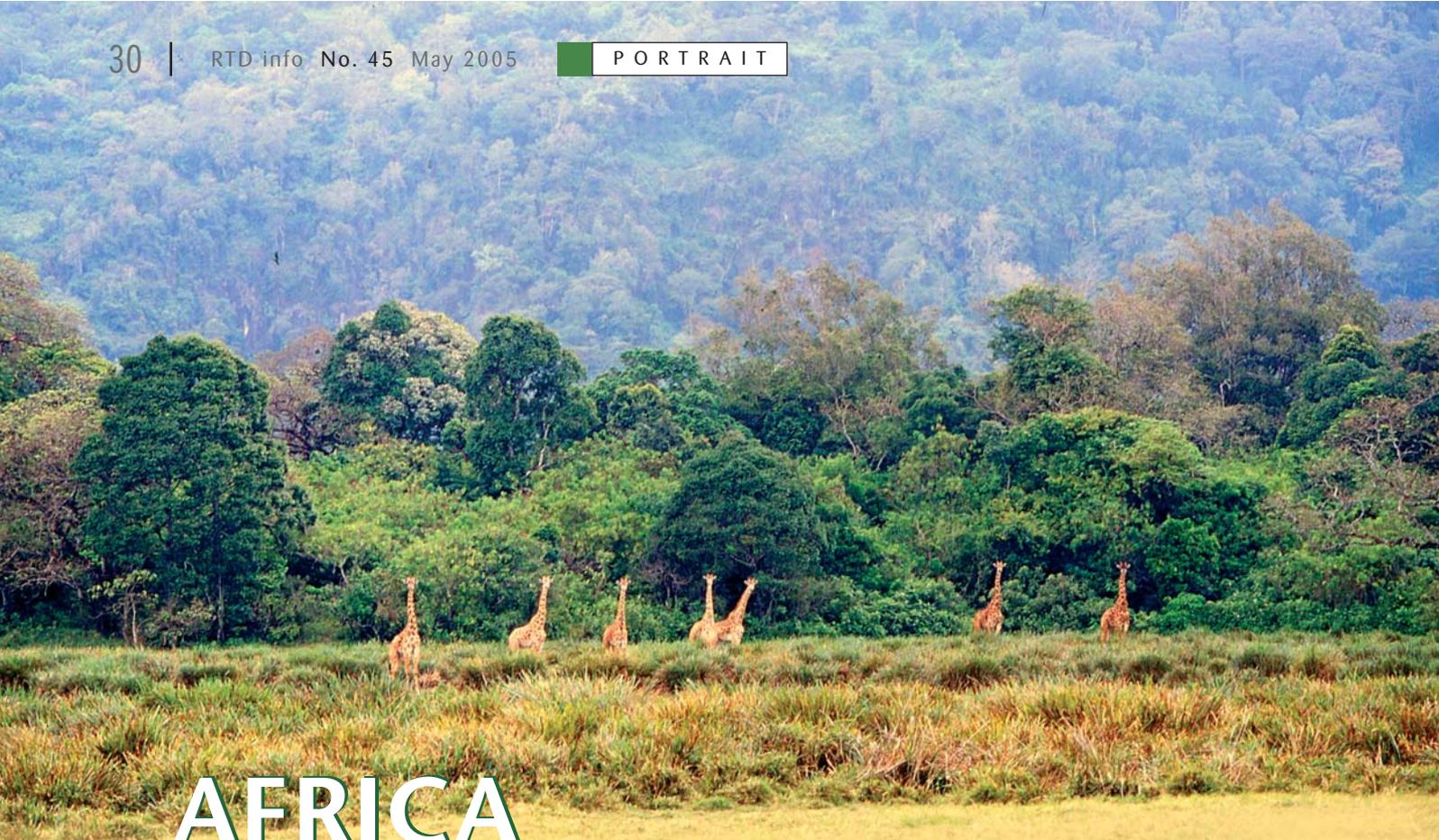
Postcode:

Town:

Country:

(* If you would like to receive several copies of one language version, please make your request, giving your full name and a brief justification:
 - by e-mail (rtd-info@cec.eu.int)
 - by fax (+32-2-295 82 20).

If you would like to receive a copy of any recent issues of RTD info, please send a brief message by e-mail or fax.



AFRICA

OUT OF

A professor at the University of York who has worked in New Zealand and the United States, Charles Perrings is an expert on Africa who has been studying sustainable development for decades. To his mind, economics and ecology form a single interdisciplinary field, the global and the local require responses that take into account their double dimension, and global problems require a global analysis. RTD info meets a tenacious and committed scientist.

"The links between ecology, economics and development are clear. It is principally poor and rural countries that suffer from the loss of biodiversity as they are highly dependent on the quality of their natural environment."

Above, an attempt to preserve biodiversity in Tanzania.

©CE/F.Jacobs

At the age of 55, Charles Perrings has an impressive academic record. Born in Zimbabwe – or Southern Rhodesia as it was at the time – he spent his childhood and youth in the African bush. His father, who worked in the gold mines, took his family to some of Africa's most remote regions. Then, at the age of 19, it was finally time for the big trip to London. The young Charles had a very precise idea of what he planned to do there: study economics while exploring in particular the mining industry and copper extraction. With his doctorate behind him, he returned to Africa to take up a first teaching post at Lesotho University.

"The mining industry was my gateway to economic questions linked to the exploitation of natural resources, whether renewable or otherwise," he explains. Perrings then spent

12 years at the University of Auckland (New Zealand) punctuated by a number of missions in Australia. He also took a two-year 'break' to help reorganise the Department of Economic Sciences at the University of Gaborone (Botswana).

Ecology-economics, Africa-USA

This experience sparked his interest as a researcher in the problems faced by semi-arid regions, looking in particular at the links between economics, development, natural resources and the environment. Charles Perrings decided to investigate a field in which he would draw on all his expertise: the unexplored territory where ecology and economics merge in a common cause.

In the late 1980s his inquiries brought him to the United States. Appointed Professor at the University of California, in Riverside, Charles Perrings worked with an international and interdisciplinary group of researchers with a passionate interest in this new field of study known as ecological economics. The scientific journal *Ecological Economics*, launched in 1989, published the results of this research. At this time Charles Perrings also contributed to the research work of the Beijer Institute, part of the Swedish Royal Academy of Sciences that, among other things, encourages the developing countries to develop their own research capacity in the field of ecological economics.

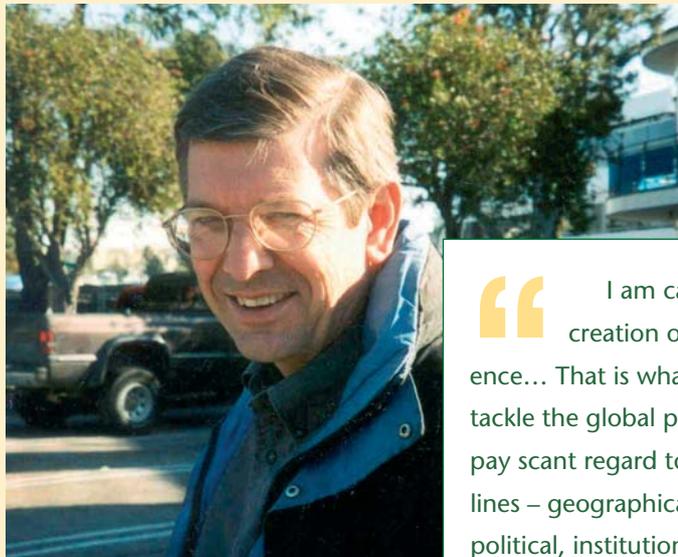
"Since that time the implications of biodiversity has been my favourite field of research, in terms of theory and modelling as well as in

applied fields relating to semi-arid or humid zones. The links between ecology, economics and development are clear. It is principally poor and rural countries that suffer from the loss of biodiversity as they are highly dependent on the quality of their natural environment. Rich and urban countries are much less dependent on the services rendered by ecosystems."

This intellectual cross-fertilisation between the natural and social sciences produced a number of concepts that transcend disciplinary barriers. "Our discussions with ecologists enabled us to identify the concept of resilience, which is a means of expressing a system's stability. Resilience gives the degree of disturbance 'needed' for a system to become unbalanced and evolve towards a new field of stability. This is a very useful notion when thinking in terms of the sustainability of systems, both natural and economic."

A new science of globality

Thirteen years ago, Charles Perrings took up residence at the University of York, where he founded the Environment Department. The studies at all levels (degree, master's degree, doctorate) are aimed at combining the economic and ecological approaches to the environment and its management. "These interdisciplinary studies are not easy. The conceptual approach and methodologies of economists and ecologists are still marked by very different scientific traditions. To draw maximum benefit



“ I am calling for the creation of a new science... That is what is needed to tackle the global problems that pay scant regard to our dividing lines – geographical, intellectual, political, institutional or whatever. ”

from this interdisciplinarity, you need to be able to integrate these differences and change the frames of reference during your work."

Charles Perrings stresses the difficulty of such a marriage. It is always difficult to overcome the barriers between disciplines, but there is so much at stake in the field of sustainable development that this kind of 'crossed' approach is essential. This new interdisciplinarity is at present being developed – with Charles Perrings' assistance – at Arizona State University (USA).

"I am calling for the creation of a new science... That is what is needed to tackle the global problems that pay scant regard to our dividing lines – geographical, intellectual, political, institutional or whatever. We must find the best local responses and the best combination of them to influence the course of events at global level. All of this also requires a real application of international conventions and of the rules of world trade."

But how can the policy-makers be made to understand this? It is difficult to persuade providers of funds, who often focus on national or regional interests, to support research on a large scale. Some scientists are nevertheless managing to make their message heard in political circles without sacrificing their independence. "This credibility is based on honesty. There is nothing worse than experts who exaggerate their case in order to be sure of making their point."

Public goods, global users

The problems studied by Charles Perrings all concern the global public goods, but expressed at different levels. Biodiversity is one example of this. The diversity of genes is a global good while the diversity of pollinating insects and the impact of this biodiversity on agriculture brings much more local benefits. "Investments for its

preservation are always under-valued. The way in which local responses interact with the international nature of the public good should be the subject of a whole field of inquiry."

But how should the global community be represented in terms of governance? It is this that must encourage research leading to the drafting and application of international agreements. Perrings, who has held posts with a number of institutions, is familiar with the subject. "The problems have evolved much faster than the institutions that are supposed to deal with them. Most of the time they have a national vision, one with its origins in the 19th

century. Such a collective, global decision-making body does not exist, at least not yet, but it seems to me that the UNEP (United Nations Environment Programme) should take on this role. There are enough qualified individuals with good intentions to work on these questions. The real problem is more the political agenda of countries that are genuinely able to stimulate this international co-operation." So is he an optimist despite it all? "Where there's a will there's a way..." ■

Professor at the University of York (Department of the Environment), Charles Perrings is Vice-President of the Scientific Committee of the Diversitas, an international scientific programme devoted to biodiversity, and President of the International Society for Ecological Economics. He is also an advisor to many governments, non-government organisations and research-funding bodies, and editor of several scientific journals on ecological economics. His works include Economics of Ecological Resources: Selected Essays, published in London by Edward Elgar, in 1997.

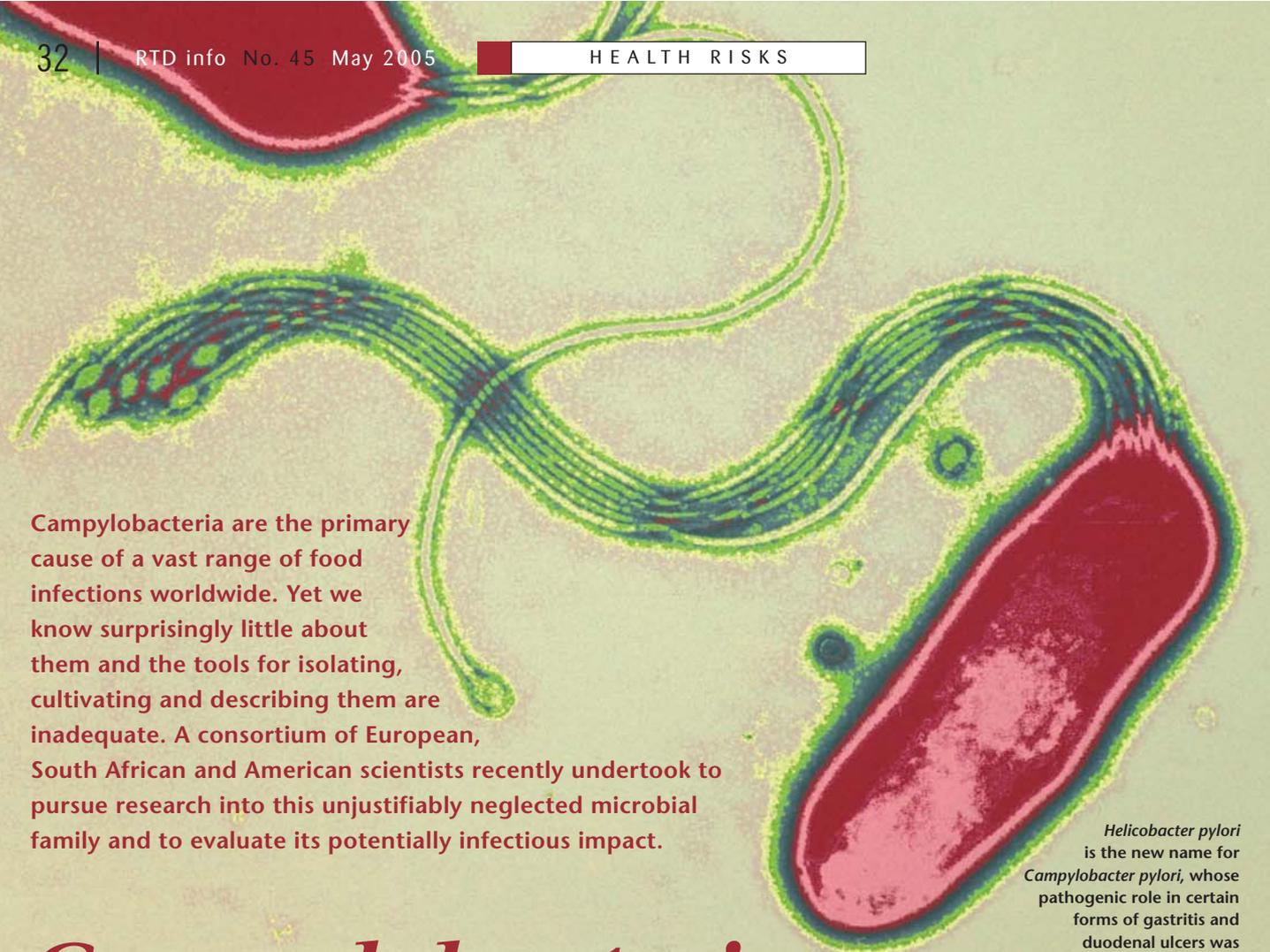
To find out more

● www.york.ac.uk/depts/eeem

Contact

● cap8@york.ac.uk

Campylobacteria are the primary cause of a vast range of food infections worldwide. Yet we know surprisingly little about them and the tools for isolating, cultivating and describing them are inadequate. A consortium of European, South African and American scientists recently undertook to pursue research into this unjustifiably neglected microbial family and to evaluate its potentially infectious impact.



Helicobacter pylori is the new name for *Campylobacter pylori*, whose pathogenic role in certain forms of gastritis and duodenal ulcers was recently identified.

© A. Labigne/Institut Pasteur

Campylobacteria under the microscope

Around 4 000 species of bacteria have been identified to date, but nobody knows how many really inhabit the Earth. Yet a better knowledge of the biodiversity of the bacterial world has implications that extend far beyond fundamental microbiology, as it could help us identify the culprits behind infectious diseases, particularly those of food origin.

Given that the causes of the vast majority of sometimes serious food infections remain unknown, the Campycheck project is of major importance. It aims to study the biodiversity of campylobacteria, a group of bacteria that are presumed responsible for around 600 million infections worldwide every year. This is applied research in the field of food safety.

Campylobacteria are bacteria in the shape of curved rods. They inhabit the digestive tract of animals – on farms and in the wild – and prefer oxygen-poor environments, some of them tolerating strictly anaerobic conditions. They are pathogenic in man, affecting mainly children and young adults and causing severe diarrhoea which, in turn, can lead to complications such as intestinal haemorrhage or generalised infection. In some – fortunately rare – cases, they develop into a serious neurological syndrome: in Guillain-Barré disease, the antibodies

the organism secretes to combat the infection subsequently attack neurons, leading to general paralysis.

Contamination can be either from direct contact with animal excrement, polluted water, or – most commonly – consumption of contaminated foods such as chicken, pork or mutton which have been cleaned inadequately in abattoirs, and also unwashed vegetables, unpasteurised milk, etc.

Two culprits?

Although we are aware of about 30 campylobacteria varieties, research to date has focused almost exclusively on just two of them: *Campylobacter jejuni* and *Campylobacter coli*. This is because *C. jejuni* and *C. coli* have traditionally been identified as the 'presumed culprits' of 99% of infections attributable to this microbial family. "All present procedures are designed to investigate these two targets that are able to survive at temperatures of 42°C," explains William Keevil of Southampton University (UK), the Campycheck coordinator. "Standardised and effective methods for detecting them are now available, thanks in particular to the Campynet programme, a network of 23 European laboratories supported by the European Union between 1998 and 2001."

The Campycheck project promoters believe, however, that researchers have been rather too quick to jump to conclusions in identifying the guilty parties. They take the view that, due to insufficient monitoring, we know little about the real prevalence of infections caused by campylobacteria. No figures are available for Europe, for example. In the United States, the Centre for Disease Control in Atlanta reports around 10 000 cases a year, about 100 of them proving fatal – but estimates that the actual number of infections annually is around 2 to 4 million, making this the main cause of food poisoning, ahead of salmonella!

Why is there this discrepancy? "Infections by campylobacteria are generally sporadic and rarely result in epidemics, as a result of which research on methods of contamination has been rather neglected," explains William Keevil. "But there is also a lack of scientific knowledge. Our hypothesis is that there are many campylobacteria species which we are unable to detect. These emerging varieties could be responsible for many illnesses wrongly attributed to *C. jejuni* and *C. coli*. So much remains to be done in this field. In particular, we must develop tests able to identify non-thermo-tolerant bacteria."

A transcontinental affair

Isolating, describing and detecting these unlisted campylobacteria is essentially the role of Campycheck, an association that includes, in addition to Southampton University, the Irish National Food Authority's laboratory, Cape University (South Africa), the University of Bologna (Italy), the Danish Veterinary Institute, and the US Department of Agriculture, representing three continents. "The aim of the project came from a conversation in the United States with Al Lastovica of Cape University, a world-renowned specialist on this bacterial family," explains William Keevil. "This global research structure is justified by the fact that the threat posed by campylobacteria, which could be carried by migrating birds, really has to be approached on a planetary basis. This is particularly vital at a time when we are seeing an increase in trade in foodstuffs between different continents."

The first task the researchers have set themselves is to acquire new tools with which to explore this largely unknown microbial world, such as low-oxygenated culture media, monoclonal antibodies able to detect proteins common to all campylobacteria varieties, and Polymerase Chain Reaction (PCR) kits able to distinguish between species and subspecies. The aim is to develop campylobacteria detection tests that can be applied in the fields of human medicine (analysis of blood diseases), veterinary medicine (on the basis of excrement obtained from farms), and health safety (food or drinking water samples).

The likely economic benefits of this innovative work are illustrated by the presence, as project partners, of two British biotechnology companies specialising in microbiological biodiagnostics – Microgen Bio-products Ltd (Camberley, Surrey) and Oxoid Ltd (Basingstoke, Hampshire).

"Eighteen months after start-up, we have the tools needed to isolate and characterise emerging campylobacteria," says the coordinator. "A number of US, Asian and European laboratories have contacted us, which shows the interest in the various aspects of our programme."

For health protection

However, the Campycheck project extends beyond this research and technological development activity. In the field of fundamental microbiology, campylobacteria obtained from the three continents on which the programme partners are based (Europe, Africa, North America) will be pooled and analysed genetically. The collection at the Stephen On laboratory at the Danish Veterinary Institute already contains around 60 strains and many remain to be described and classified.

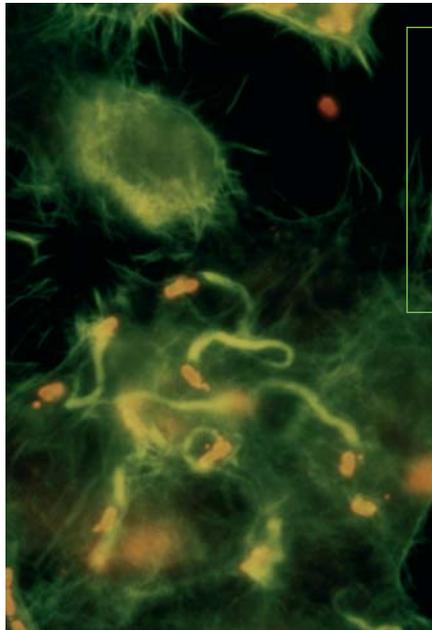
Our knowledge of microbial biodiversity, which is patchy to say the least, will be boosted directly from this. But it is in the field of public health that the most benefits are expected. In co-operation with the food safety authorities in a number of countries, Campycheck plans to undertake an epidemiological study of the prevalence of campylobacteria at various stages in the food chain, from 'farm to fork'. "The project's ultimate aim is to obtain a risk management model that will make it possible to discover whether or not new and emerging varieties of campylobacteria carry a risk on the same scale as *C. jejuni*," concludes William Keevil.

To find out more

- www.campycheck.org
- campynet.vetinst.dk

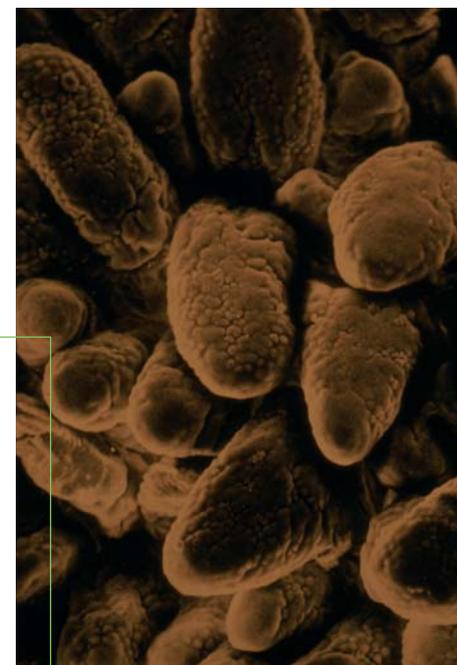
Contact

- William Keevil
C.W.Keevil@soton.ac.uk



Intracellular motility of the *Shigella* bacterium which invades and destroys the intestinal mucous of the colon, causing diarrhoea. It moves around the infected cell and propagates in neighbouring cells by creating a tail of polymerised actin.

© J.P.Sansonetti/Inserm

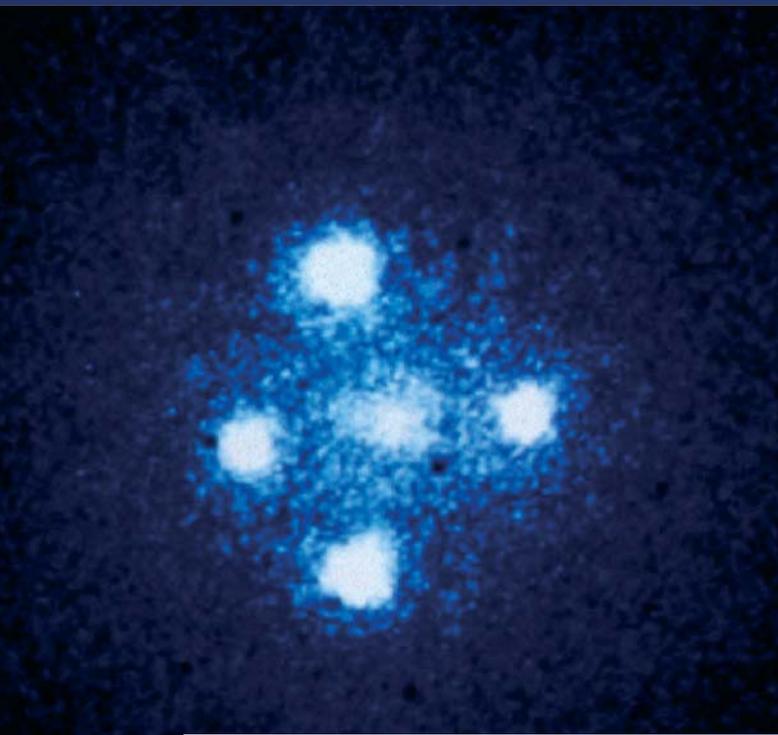


The intestinal wall forms multiple folds covered in villi: this picture shows the upper section (apex) of the absorbent polygonal cells that constitute the villi of the small intestine. It is these cells that absorb food.

Size: 0.1 mm in diameter per villus.

© C.Haffen/Inserm

When distant worlds meet



The Einstein Cross, a gravitational mirage: the points that make up the cross are four images of the same distant quasar, formed by the gravitational action of a closer galaxy. © HST

1 Asteroseismology – Who could possibly claim to understand the workings of human biology simply by observing people's skin? Yet this is precisely the paradox facing astronomers who observe the stars through telescopes. What they are seeing is no more than a fine light-emitting layer – the photosphere – that forms the surface of stars. The difficulty lies in penetrating this surface layer to understand the phenomena at work at the heart of these stellar masses.

"As difficult as it may seem, astronomy has started to gain access to the interior of stars by studying their oscillations, a discipline known as asteroseismology," explains Conny Aerts (Katholieke Universiteit Leuven, BE). Some important discoveries are being made by this relatively recent field of research which make it possible to model the internal structure by recording the pulsations emitted by seismic shocks caused by stellar oscillations. The SOHO satellite, for example, was able to demonstrate the complex internal rotation of the Sun and

the existence of plasma rivers beneath its surface. The pulsations of other stars have revealed their fundamental properties, such as mass, chemical composition, rotation, etc. Today, the use of space observatories is revolutionising asteroseismology. "Satellites not only permit a continuous monitoring of pulsating stars, they also enable us to increase the recording precision by a factor of 1 000."

2 Solar system and astrobiology – Europe is a key player in the exploration of our solar system, whether it be Mars (Mars Express), Titan (Huygens), Mercury (Bepi Colombo), Venus (Venus Express) or the comets (Giotto, Rosetta). In addition to gaining precise knowledge of our neighbouring planets, astronomers make no secret of an

Titan as never seen before in a recent picture taken by the Huygens European space probe.

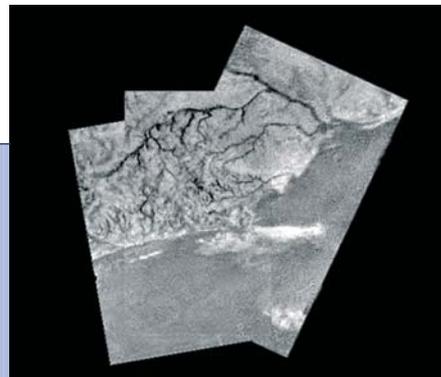
One of Saturn's moons, Titan shares many features with the Earth. Rather than liquid water, it possesses liquid methane just a few centimetres below its surface, 'rivers' of which are clearly visible.

© ESA

ambition on an altogether different scale: the search for the constituents of extra-terrestrial life.

Astrobiology – the name given to this new kind of quest – is also interested in detecting 'biosignatures' outside the solar system. These are exoplanets that gravitate around other stars. A Swiss team discovered the first of these in 1995; today over 120 have been found and the potential for new discoveries remains vast.

3 Quasars: host galaxies and gravitational lenses – Quasars are distant galaxies (more than 2 000 light years away) with a huge black hole at their core. This giant ogre continuously swallows phe-



nomenal quantities of the gas present in the host galaxy. Before dying, these gaseous masses engage in a magnificent swan song that makes them one of the brightest bodies in the universe.

“Due to this brilliance, quasars are the most distant objects we are able to study, giving us access to a primordial universe,” explains Frédéric Courbin (Ecole Polytechnique Fédérale de Lausanne, CH). The light emitted by these distant beacons illuminates the intergalactic environment that places its signature on their spectrum, making it possible to determine the moment when the first stars illuminated the universe. Also, due to general relativity, the light of quasars can be deflected by closer galaxies – which have a lens effect – and give rise to gravitational mirages. “The study of these cosmic mirages is an instrument of analysis by the Hubble Constant, the cosmological key to the theory of the expanding universe and thus to the time elapsed since the Big Bang.”

4 Roadmap for interferometry – A fairly recent tool for astronomers, interferometry is based on a simple principle. Instead of using a very large telescope, a number of smaller devices are used and their signals are combined, resulting in a comparable observation quality at a significantly reduced cost. This technique, nevertheless, requires a degree of precision in combining the beams that is much smaller than the wavelength, which is why for a long time it was limited to long radio waves. European astronomers succeeded in transposing this technique to the field of the visible in which wavelengths do not exceed the micron. They are currently developing the most powerful interferometric instrument in the world, the VLTI (Very Large Telescope Interferometer). Installed in Chile, the VLTI uses siderostats⁽¹⁾ measuring 40 cm across. With this modest equipment, scientists have already obtained a number of important results, including the determination of the real size of cepheids and the thickness or elongation of certain stars, etc.

5 Massive stars and high-energy emission – “Very massive and very hot stars have a major effect on their environment, sculpting the interstellar environment and sowing the universe with the heavy chemical elements that are now all around us. Sometimes they are even able to modify the structure of galaxies,” explains Ian Stevens (University of Birmingham, UK).

European space observatories, such as Integral and XMM-Newton II, have made it possible to observe these objects in the high energies of the OB Associations. Here they show their true nature, revealing violent

phenomena such as the mysterious collisions of stellar winds, of which we were unaware just a few decades ago.

There remain many unanswered questions. “We have a general idea of their evolution,” stresses Ian Stevens, “but the details remain vague, especially the way in which these stars die.” ■

(1) Fixed-direction observation device, compensating for the Earth's rotation.



A hot star (over 120 000 degrees on the surface, compared with the 6 000 degrees of our Sun) heats the centre of the nebula. The mauve colour indicates the hottest areas where temperatures can reach several thousand degrees.

© ESO

For the stargazers

Light seems a familiar concept to us, but it holds some unsuspected secrets. It was not until about 200 years ago and the discovery of infrared rays that the immensity of the electromagnetic spectrum first became apparent. Over the past 50 years, the discovery of these new ‘colours’ that are invisible to the naked eye – in the gamma, X, ultraviolet, infrared and radio fields – has caused a revolution in astronomy, revealing a mysterious background radiation, strange pulsating stars and very active galaxies. This ‘Rainbow Universe’ will be presented by Yaël Nazé, of the Institut d’Astrophysique et de Géophysique de Liège, on the

occasion of the JENAM 2005. Other planned activities include a nocturnal sky observation session entitled ‘Travel in Space’, and a ‘science café’ on the question “Is there life in the universe?”. All these will take place in the company of astrobiologists and officials from the European Space Agency (ESA) space exploration programmes. www.astro.ulg.ac.be/RPub/Colloques/JENAM/outreach/outreach_fr.html

To find out more

○ Yaël Nazé

Institut d’Astrophysique et de Géophysique, Liège University (BE)
naze@astro.ulg.ac.be

COPING *with life on the* OUTSIDE

©Jane Evelyn Atwood



Women's prison, Metz (France)

The door slams shut – and who can say when it will really open again? Just how do women prisoners reintegrate into a society that has often previously rejected them? The partners in the European MIP (Women, Integration after Prison) project tried to find some answers to these questions in six countries – Spain, Germany, Great Britain, Italy, France and Hungary – by considering the people, infrastructures and legislation that may be available to help them. They spoke at length with female prisoners, both before and after their release, and interviewed a range of people working within or close to the prison system, such as prison warders, judges, probation officers, social and voluntary workers. Their detailed, in-depth and remarkably well-coordinated work sheds light on a form of social exclusion that also shows gender differences.

“I attended primary school. But after that I was forced to leave because my parents didn't have enough money. I started to work at the age of 14 and then got pregnant. I worked for more than 14 years. My husband left me and my debts started piling up. My daughter was going to a private school but I could no longer afford to pay for it. So when I was offered a trip to the Netherlands I accepted. I started trafficking drugs all over Europe, earning between \$5 000 and \$6 000 a time. Then I was arrested.” This is the personal story of a convicted female Italian drugs trafficker, but a story that has much in common with many others. Prisoners, men and women, often suffer a similar fate: exclusion. Prisons are primarily places for people who do not conform, rejected by society, considered by some as undesirable because they are illegal immigrants or asylum-seekers, belong to ethnic minorities, or suffer from countless other handicaps.

Social divides

This disparate population is often poorly housed, unemployed, undernourished and uncared for. Within this group it is often the women who are the poorest. Earning lower wages and usually with children to provide for, they are frequently the first victims of unemployment. In Germany, most of the interviewees⁽¹⁾ were unemployed before their detention, in debt and with a drug or drink problem. The situation is much the same in France, Spain and

Italy. According to the British statistics, one-tenth of women starting a prison sentence are homeless and one-third of those who did have accommodation and some possessions lost everything while serving their sentence. Most women have financial problems and debts that get worse while they are inside. The British researchers also found that about half of the women prisoners interviewed had been victims of violence and, in one in three cases, of sexual violence. This violence, often experienced since childhood, is also an important factor in Spain, Germany and Hungary.

Three profiles

Prison conditions are cramped. In Spain, women prisoners complain of everybody being thrown in together – all ages, for all crimes and serving sentences of various lengths. “In prison, there were 200 of us. That means you never have a moment on your own. I like some peace and quiet. I need independence and a little privacy,” insisted one prisoner.

“Everywhere you see this alarming lack of human resources, material resources and very serious overcrowding. This often results in the violation of the strict human rights to which prisoners are entitled. The working conditions of prison staff also seriously undermine the quality of their work,” explains Marta Cruells of the Spanish organisation SURT, and project coordinator.

(1) The studies were carried out by interviewing women in a number of prisons. Although significant in their findings, the resulting data should not be regarded as statistics.

But overcrowded by whom? French researchers identified three types of women prisoners: classic deviants, with many social handicaps and victims of exclusion, usually serial offenders with a drug problem, essentially comparable to their male counterparts; women who have often been the victim of violence or who are accomplices in crimes committed by their partners, who are generally in prison for the first time and for a serious offence (murder, child abuse, drug trafficking, etc.); and women who do not fit the pattern, professionally integrated, educated but, once again, imprisoned for a serious offence. These three profiles show the social, penal and individual characteristics that together illustrate the different routes that lead to prison. In one way or another, they are all marked by exclusion.

Powerless but responsible

As varied as they may be, all these prisoners are women. The British researchers stress the extent of their dependency on men, for whom or because of whom they find themselves on the wrong side of the law. The dependency is not only financial or emotional, but is also cultural. “Men have shaped my life. I lacked self-confidence. Through marriage, having a man was an achievement. My second husband told me that I was stupid and skinny and that was why I had such low self-esteem. I was attracted to that kind of man. Now I believe I have opened my eyes as far as women's rights and also male power are concerned.”

But even if they have no power, in prison women's responsibilities cannot be ignored. They are often responsible for providing for their children, or their family, and have to give them any meagre wages they may earn. Women prisoners everywhere feel guilty, worried and plagued by questions. Where are my children and who is going to look after them? Are they going to go off the rails too? What do they think of me? Prison officers see in what they describe as the ‘sorrow of mothers’ one of the most painful aspects of their incarceration. “I am sad because of my children. We did not spend many years together. Now they are grown up. It is a strange situation.”



©Jane Evelyn Atwood



Regional detention centre for women, Joux-la-Ville (France).

Unsustainable relationships

Among the reasons why relationships with children and family deteriorate are the prison regulations governing visits, telephone calls, etc., coupled with geographical location. People without the proper identity documents are unlikely to travel and the cost of international phone calls can be expensive. In Hungary, Germany and Spain access by public transport to a number of women's prisons is particularly difficult as they are located outside of towns. Consequently, many detainees ask to be transferred to better-located but overcrowded detention centres. The frequency and length of visits vary from country to country – from an hour a week to two hours a month. In such circumstances it takes strength, on both sides of the bars, to maintain positive relationships. "My family and children visited me regularly for seven years. Then they stopped, because the meetings had become totally impersonal. Two hours is not enough to sustain a meaningful relationship. Those outside do not tell you the truth about things because they are afraid of worrying you. And the person locked up does not want to complain. The result is that there is no honest communication."

In several countries, special measures are in place to maintain more concrete links with close friends and relatives. In Germany, for example, some prisoners are allowed to go on day release to look after their children or a family member who is ill. In Hungary, the LER (Lenient Executive Rules) system allows some prisoners to spend one weekend a month at home. Other schemes exist in France and Spain.

Working on the outside

Employment is a way of maintaining links with society. This does not apply to work in the prison itself, which is more concerned with occupying than educating prisoners who are assigned tasks such as cleaning, washing, cooking or perhaps simple assembly or packaging work. Some 60% of women prisoners in Hungary, 40% in France, 33% in Italy, and 90% in the United Kingdom have jobs of this kind during their imprisonment, at least for some of the time. 'Real' work – which is much less common – refers to work outside the prison walls. In Spain, the open-prison system allows some women prisoners to work on the outside during the day. "Nobody knows I am in here. People invite me for a coffee after work, but I have to

say that I have to go to the hospital to visit my sister who has cancer. Sometimes I am invited out to a restaurant, but again I have to refuse. I would like to tell the truth, and explain that I had problems in the past but that I am a new person now, but I always have to lie."

Although such situations are not always easy, they are a positive step towards reintegration. The vast majority of those active in the prison system see preparing prisoners for successful release as an essential mission of the prison. "We need more resources to meet these needs," says one Spanish prison governor. "Human and economic resources – but with the size of the present prison population it is very difficult to achieve results."

Training

Training is also seen as a path to the labour market, although few actually receive it. Germany has initiated basic training (EDP qualification) which prisoners can continue to pursue after their release. Computing is taught in Germany, Spain and Hungary while training in computer-aided graphics and desktop publishing is available in Italy and at one German

prison. Several countries offer language courses for foreigners. Training in the new technologies is available in the United Kingdom, the most advanced country in this field of learning (and in prison policy in general). It is not unknown for women serving long sentences in the UK to leave with a university degree.

In some cases, female prisoners serving long sentences benefit from a transitional system in the two years prior to release. This enables them to work outside the prison as a means of progressively reintegrating into everyday life. As to the others, very few receive help in finding accommodation – always a crucial factor – a job, or any psychological assistance on their release. In the United Kingdom, prisoners can request personal assistance with any problems relating to drugs, drink or sexuality, for example, and some prisons have job clubs to help inmates reply to a job offer or attend an interview. In Germany, ex-prisoners have their rent paid for one year by the public authorities, and the social services and NGOs are very efficient in finding accommodation. Budgets are being cut just about everywhere, however, and assistance of this kind is very much under threat.

The trauma of being free

Freedom is not painless. Coming out of prison often means entering a world that has changed a great deal. Many former prisoners admit to feeling very disorientated for several weeks if not months after release, suffering from depression, insomnia and nostalgia for the daily routine of prison life. Many experience distrust of others and especially of institutions. They find it difficult to organise their time, set priorities, listen to people, take initiatives and make decisions. Everyday social skills have been blunted by the experience of prison. After tending to idealise family relations while locked up, once confronted with the reality they find them very complicated, especially if children are involved. Their financial situation is often even more difficult than before they went to prison. Many of them have no accommodation of their own and return to live with their parents, once again finding themselves in a situation of dependency. Few find any kind of job at all within the first month or two of release. A prison record does not help matters and in most countries it is a real barrier to employment.

“Prison punishes, destroys and marginalises. It encourages childish behaviour and disconnects from the social network,” is the view of one prison governor. “How do I see myself one year from now? In prison, yet again! One year older,” says one prisoner.

It was to identify some concrete steps to help remove such a sense of despair that the researchers with the MIP⁽²⁾ project put their questions, listened to the replies, analysed the figures and compared prison policy. Herta Toth, a member of the Hungarian team, believes that “the situation of women prisoners in the six countries studied is not at all homogeneous, but their problems are similar. Certainly more attention is paid to their situation in the United Kingdom than elsewhere. Nevertheless, in most countries, and in Hungary in particular, people are beginning to listen more particularly to the problems of women prisoners – such as the domestic violence of which they are so often the victims. But the attention they receive individually after leaving prison is insufficient everywhere. This is due to a lack of coordination between those who should, in principle, be looking out for them. Everywhere there is a lack of resources, personnel and time.”

“Integration is a task that transcends the prison walls”, the MIP project partners conclude. “We need the co-operation of the community as a whole and must face the risk – the reality even – of a situation in which prisons become places of poverty management, locking up people who are really a case for the social services.”

To find out more

● www.surt.org/mip/
All the national reports and the final report are accessible on the website. A conference presenting the project results was held in Barcelona on 8 April.

Contact

Marta Cruells - SURT (Women's association for professional reintegration), Barcelona
 ● marta@surt.org

(2) The acronym MIP comes from the Spanish *Mujeres, Integración y Prisión*.

Prisoners, male and female

The gender divide transcends the prison walls. In most countries, there is no specific mention of women prisoners' needs in the prison policy reports in which the populations are globalised. The only exception is maternity (births and babies in prison), even though this only concerns a minority of women prisoners. Why?

Although there are far fewer women than men prisoners, making up between 4% and 8% of the prison population in the countries studied, this does not prove to be to their advantage. Women prisoners are often placed in a unit annexed to a male prison which is an obstacle to their access to specific activities and services – such as medical services, anti-drug-addiction programmes, work and training.

They may also end up in detention centres for women. Although many such centres are located outside of towns, which poses difficulties in terms of visits and outside employment, they are at least

designed and managed with a female population in mind. In Germany, for example, prison governors believe that women prisoners do not need such stringent surveillance and security standards as men prisoners.

“Although some specific initiatives have been taken, such as the Women's Offending Reduction Programme in the United Kingdom, or other projects for women in Germany, few countries pay attention to equality between men and women when it comes to prison populations. Europe nevertheless recommends that such a policy should be applied in all fields,” concludes Marta Cruells. “Also, our research shows that imprisonment is even more traumatic for women than for men. They have less support from their family, are viewed more negatively by society, suffer on account of their children, and have more difficulty gaining access to activities, training, social and psychological assistance, etc.”

Researchers *take* centre stage

Researchers have long since left their ivory towers. Yet while links between science and society are beginning to be recognised, the actual work of the scientist remains shrouded in mystery and viewed by many talented young people as offering difficult and poorly paid careers for the dedicated few. In order to cast the spotlight on research occupations, the European Union is launching the Researchers in Europe initiative. RTD info looks at this multi-faceted event that will run from June to September.

The calculation is a simple one. The now famous 3% objective (3% of Europe's GDP allocated to research) implies an increase in the number of scientists of between 600 000 and 700 000 by 2010. It is an ambitious figure and to achieve it will mean capturing the interest of young people, dispelling their doubts, revealing the truth about a career that remains very vague in many people's minds, and highlighting the role of science in the society which it serves. With this aim in mind, the 'Researchers in Europe' initiative has launched a Europe-wide appeal for all kinds of projects offering an 'imaginative' approach to providing the general public with a window on science.

In Ireland, for example, the Save the Robots festival will be held at Dublin's Ark cultural centre for juniors, from 22 June to 30 September. More than 15 000 young people are expected to attend this fun event where they will be able to discover the history of some strange 'creatures' (from Egyptian automatons to the most futuristic robots), attend seminars on the secrets of their creation (in the company of engineers, scientists and artists), explore the intricacies of artificial intelligence and prepare their visits in advance with their teachers with the aid of teaching kits. But why robots? Because children like them, because we can learn a lot from them, and because they are developing a certain individuality or even sensitivity that is extremely interesting, explain the organisers. This latter and no doubt surprising aspect will be highlighted in particular by artists working in this field, such as Chico MacMurtrie, Marc Pauline and Natalie Jeremijenko.



Opening a window on science? That has long been a policy of the prestigious Cern institution in Geneva. Pictured is a visit to its Microcosm. ©CERN/Laurent Guiraud

Further east in Poland, the ninth Festival of Science will be held in Warsaw from 16 to 25 September. In 2004, this popular event drew 60 000 mainly young visitors, attracted by the films, debates, laboratory visits and the chance to meet researchers 'in the flesh'. Subjects on the agenda for the 2005 event include 'Science is not complicated', 'Science and daily life', and 'Making medicines'. In this year of physics, the organisers are also planning to give prominence to physics, while not forgetting the human sciences with a debate on aggression and violence in which members of the public will be invited to participate alongside scientists from various disciplines.

Also worthy of mention are the 'Cabinets of curiosity', organised by three Irish institutions (University College Dublin, Department of the Environment information service, and the Museum of Ireland) with the aim of stimulating interest in Europe's natural history museums, the Scius (Science Circus) project that will focus on present and future women researchers, and the various events being held over a period of several months in Iceland, organised by the Icelandic Centre for Research (Rannis).

These are just a few examples of events under the Researchers in Europe initiative, to be launched on 8 June under the Luxembourg presidency at the Luxembourg Museum of Natural History. One of the highlights on this occasion will be the research night on 23 September, during which a variety of events will be held in a number of European towns with the help of universities, science museums, planetariums, research centres and others. The event will close under the patronage of the Irish authorities during Marie Curie Week, to be held in Dublin in November. ■

Contact

● Colette Renier
Colette.renier@cec.eu.int

To find out more

● <http://europa.eu.int/researchersineurope/>

