

NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society

“ALWAYS, UNFETTERED MAN, YOU WILL CHERISH THE SEA” *

The Mediterranean - this sea at the centre of the earth and at the heart of Western civilization - is and always has been a place poised between East and West. The Mediterranean is *par excellence* the seat of dialogue between cultures. NATO understood this very well when in 1994 the “Mediterranean Dialogue” was created, to promote understanding, trust and security among the peoples of the region.

This issue of the Science and Society Newsletter recounts how the Science Committee and the CCMS approach the matter of cooperation between NATO and the seven countries of the Dialogue.

But this issue also gives us the opportunity to highlight the major evolution of our programmes and activities. The fundamental mission of the Atlantic Alliance is the security of its members and partners. How can scientific research, and in particular, civil science, help us to confront the new threats which bear down on our security? How can the networks built up between researchers over many years best be used? How can we profit from the dynamic of science to rise to these new challenges?

It is to these questions that the Science Committee wanted to bring the elements of a solution, and we present them to you in the following pages.

* Charles Baudelaire

Jean Fournet

MEDITERRANEAN

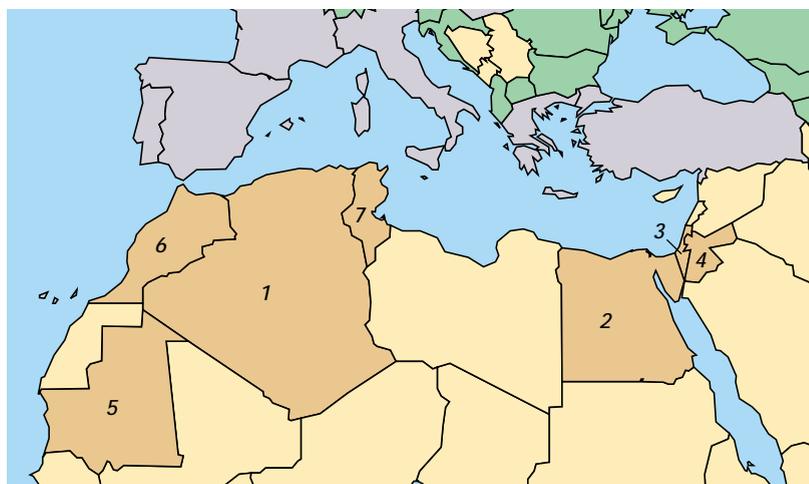


DIALOGUE

Focus on the Mediterranean region

Through NATO's **Mediterranean Dialogue**, seven countries of the Mediterranean region are closely involved in the Science and CCMS programmes. **Algeria, Egypt, Israel, Jordan, Mauritania, Morocco and Tunisia** are the countries of the Mediterranean Dialogue, and together with the NATO and Partner countries bordering the Mediterranean Sea, they form a varied and fascinating region, which many recognise as the cradle of Western civilisation.

The science and CCMS programmes allow the scientists of the region to collaborate with their peers in our transatlantic alliance, and we will showcase here some of these activities. Certain research topics are of particular interest to the region - and the upcoming CCMS-Science joint workshop on **Desertification in the Mediterranean Region: a Security Issue** highlighted on page 3, is a pertinent example. Others, such as topics in the physical sciences, are less easily accessible to the non-specialist, but have given the scientists of the region the opportunity to work in collaboration with the wider scientific community.



Countries of the Mediterranean region, showing NATO countries in grey, Partner countries in green, and the Mediterranean Dialogue countries in sand, identified as 1-Algeria; 2-Egypt; 3-Israel; 4-Jordan; 5-Mauritania; 6-Morocco and 7-Tunisia

Scientists in some of the Mediterranean Dialogue (MD) countries have had little opportunity in the recent past to meet and work with colleagues in other countries, either for economic, cultural or political reasons, and we are making efforts to bring to their attention the opportunities presented by the NATO programmes. Nevertheless, scientists from all the MD countries have already participated in the programmes. Our challenge is to increase this participation. Many of the new priority research topics, outlined on page 11, are of concern to the security and stability of the region, and we hope that their scientists will be able to make use of the opportunities on offer to work in these important fields. In 2004 the scientists from MD countries will for the first time be eligible for support under Science for Peace, and also in the science and technology policy area, which is being expanded to include social sciences.

Late News

2003 NATO Science Partnership Prize p. 12

New 2004 programme information p. 10-11

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Science and Environment in the Mediterranean Dialogue

To put the collaboration in science and environment with the Mediterranean Dialogue countries in its political context, excerpts from relevant NATO policy documents are provided here. The documents referred to may be found on the NATO web site.

- Alliance leaders at their summit in Prague in November 2002 endorsed a document entitled **Upgrading the Mediterranean Dialogue, Including an Inventory of Possible Areas of Cooperation**. The science and environment activities were among those listed in a section dealing with upgrading the practical dimension, and the relevant paragraphs read:

The scope for expanding and deepening existing cooperation, including on defence and military issues, aimed at building sustainable peace and security and averting conflicts, encompasses the following inventory of possible areas of cooperation:

...

1. Science and Environment (SEA), including activities in the fields of desertification, drought, management of water and other natural resources, effects of climate on agriculture, marine science in the Mediterranean Sea, regional medical problems, biotechnologies for agriculture, cooperation on environmental pollution possibly including Environmental Protection, and Challenges of Modern Society.

- An annual Work Programme for the Mediterranean Dialogue is drawn up, which sets out practical cooperation activities to be undertaken by NATO with Mediterranean Dialogue partners. The **2003 Work Programme** includes the following:

1. Besides its primarily political objectives, the Mediterranean Dialogue (MD) aims also at pursuing practical cooperation. In this regard, an annual MD Work Programme (MDWP) specifically intended for MD countries is established with the overall aim of building confidence through cooperation. . . .

2. The annual MDWP is usually prepared by the NATO Staff and is based on inputs received from relevant NATO bodies as well as MD countries. Once agreed by the North Atlantic Council (NAC), the annual MDWP is submitted to the MD countries for their consideration and possible comments before its actual implementation. . . .

6. The 2003 MDWP takes into account the Prague Document and foresees activities in the following areas: . . .

3. Scientific and Environmental Affairs

- Speeches given by NATO Secretary General, Lord Robertson, to the Royal United Services Institute London may also be found at the NATO web site. At a conference in 2002 he spoke on **NATO and the Mediterranean - Moving from Dialogue Towards Partnership**, when he posed the question - Why and how does the Mediterranean matter to NATO? - and then gave six significant reasons. A 2003 follow-up conference was organised in cooperation with NATO's Public Diplomacy Division, on **NATO and Mediterranean Security: Practical Steps towards Partnership**.

www.nato.int/med-dial/home.htm

New Science Committee member for Czech Republic

Dr. Milada Glogarová has been appointed to the NATO Science Committee as representative of the Czech Republic. Dr. Glogarová is Deputy Director of the Institute of Physics of the Academy of Sciences of the Czech Republic, and is the first woman to be appointed a member of the Science Committee.

Born in what was then Czechoslovakia in 1942, Dr. Glogarová attained her first degree in Mathematics and Physics at Charles University, Prague in 1964, and a doctorate (CSc) in Solid State Physics in 1975. She began her career at the Institute of Physics, Prague, in 1964, where since 2000 she has been head of the Section Condensed Matter Physics, and Deputy Director of the Institute since 2001. She has been a member of the Assembly of the Academy of Sciences of the Czech Republic since 1994.

During her career Dr. Glogarová has worked at a number of foreign institutions, including the University of Picardie, Amiens, France (1999), the University of Porto, Portugal (1996), the University of Paris-Nord, France (1994) and Nagoya University, Japan (1992).





Desertification in the Mediterranean Region: A Security Issue

A significant NATO workshop, sponsored jointly by the Committee on the Challenges of Modern Society (CCMS) and the Science Committee, will take place in Valencia, Spain from 2-5 December 2003, dealing with desertification in the Mediterranean region. The problem of desertification is of pressing interest to countries of the Mediterranean region, as for many other areas of the world. Desertification is defined by the United Nations Environment Programme as - land degradation in arid, semi-arid, and dry sub-humid areas of the world resulting from a combination of factors including climatic variations and human activities.



In line with NATO's strategic objectives, both CCMS and the Science Committee are addressing the impact of environmental degradation on peace, stability, and security by examining the issue of desertification. The main objective of this workshop will be to combine a scientific understanding of desertification on a large scale, i.e. at regional and national levels, with societal and economic responses. Researchers, scientists, land managers, policy makers, government and non-government representatives, expert in desertification issues, will attend. The workshop is being organized jointly by the US Environmental Protection Agency, the University of Valencia, the UN Convention to Combat Desertification and the Desert Research Institute, as well as the NATO Science and CCMS secretariats.

The workshop will provide the opportunity to apply new technologies and to integrate both natural and social sciences within a framework of mutual international cooperation. Among the themes to be examined are: consequences of degradation on social, economic and political issues, especially in relation to food security and migrations; land use and human demographic change; forecasting techniques, early warning systems and alternative future analysis; regional cooperation and information-sharing mechanisms.

One objective will be to establish an expert working group following the workshop to develop further the issues raised, to be composed of NATO member, Partner and Mediterranean Dialogue nations.

Among the workshop's key speakers will be Hans Guenter Brauch, who in a recent book* has highlighted the link between security and environment. It is this aspect of the effects of desertification on national and regional security which is of particular concern to NATO, in a domain which is being urgently studied from different points of view by many agencies.

The CCMS and Science web sites give further information on the workshop (www.nato.int/ccms and www.nato.int/science).

* *Security and Environment in the Mediterranean* published by Springer, price €130. The book includes a foreword by NATO Secretary General Lord Robertson.

CCMS Reports available

The report of the March 2003 CCMS Round Table on "Prevention and Mitigation of Societal Disruption", featured in the last Newsletter, is now available as paper copy (CCMS Report No. 264). It can be obtained from CCMS Secretariat (e-mail: ccms@hq.nato.int or fax: +32-2-707 4232). Presentations are also available on the CCMS web site (www.nato.int/ccms).

Also available at CCMS Secretariat are the following recent final reports:

- Sustainable Building for Military Infrastructure (No. 263)
- Vulnerability of the Interconnected Society (No. 262)
- Methodology, Focalization, Evaluation and Scope of Environmental Impact Assessment (No. 260)



An Overview of Mediterranean Dialogue Collaboration

Since scientists in the Mediterranean Dialogue countries became eligible for support for the collaborative activities of the Science Programme in 1999, there has been a significant increase in applications from the scientific community in these countries. It cannot be ignored that Israel submits by far the largest number of applications - for example in 2002, applications from Israel accounted for 42% of Mediterranean Dialogue applications. It follows therefore, that Israel receives the largest share of the grants to Mediterranean Dialogue countries. However, by 2002 the number of applications received from the other countries combined exceeded for the first time those received from Israel, and the number of awards reached equality. This trend appears to be continuing in 2003. We hope that in future years the participation of all the Mediterranean Dialogue countries can be increased, especially with the introduction of the new Priority Research Topics outlined on page 11 many of which are of particular interest to the region.

The breakdown of awards between disciplines for Mediterranean Dialogue countries shadows fairly closely the breakdown for all awards, although Environmental and Earth Sciences accounts for a higher percentage than in the science programme as a whole. This no doubt reflects the oft-repeated concerns of these countries for the problems associated with environmental security.

The United States at 24%, is the most popular collaborative partner for Mediterranean Dialogue scientists, with France and the United Kingdom not far behind at 21% each. Regional collaboration is also popular, with Spain, Italy and Turkey at around 10% each.

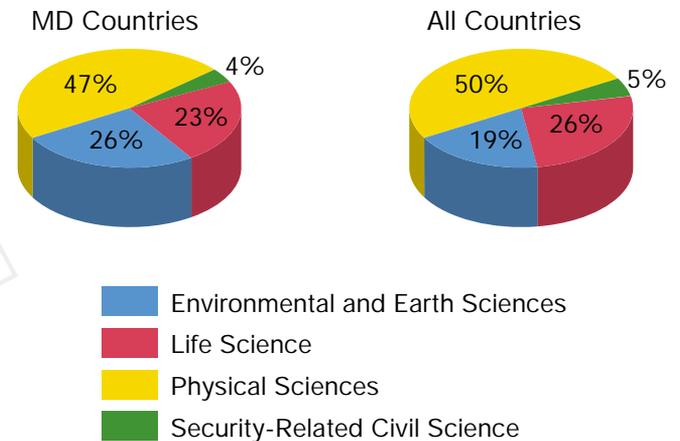
**Mediterranean Dialogue (MD) Countries
Number of Research Teams Awarded Support**

	1999	2000	2001	2002	2003**
ALGERIA*	-	-	1	1	7
EGYPT		2	6	6	2
ISRAEL	4	21	30	18	11
JORDAN	1	-	-	-	2
MAURITANIA	-	-	-	-	-
MOROCCO	1	7	7	7	7
TUNISIA	1	2	5	4	3

* Algeria joined the Dialogue in 2000

** half-year figures: 2003 granting period still underway

**Percentage Distribution of Awards
between Scientific Disciplines
1999-2003**



The Science Committee at 45

The NATO Science Committee will mark its 45th anniversary year with a celebration dinner on 23 October, to coincide with its autumn meetings to take place on 22-24 October. At the first meeting of the Science Committee in March 1958 representatives from thirteen of the fifteen NATO countries met and mapped out the contours of a programme that was eventually acknowledged by the scientific community to be an indicator of scientific excellence, and which proved to be adaptable and resilient in the face of many changes that could not have been foreseen. Representatives from 46 countries - members of the Science Committee in Euro-Atlantic Partnership Council format - will be at this 45th anniversary meeting, and will usher in a new era of change, as the Committee adapts its programmes once more, as outlined in these pages, to meet the new challenges of the coming decades.



Water Resources and Security

Water problems exist worldwide, and they are particularly acute in countries of the Mediterranean Dialogue. Water resources are not only a social and economic issue, but also a security issue, and water can even be compared to oil in its importance to border security. Science has an important role to play in tackling the many different problems associated with reliable provision of clean water, and it is a popular area of study among the scientists of the Mediterranean countries. The subjects of the following Collaborative Linkage Grants recently supported under the Environmental and Earth Sciences area are quite varied, but they all deal with aspects of the water problem. The results of all collaborative grants are published in relevant scientific journals, and presented at specialist conferences, so that the findings are available to all.

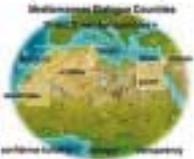
- The objective of this collaborative project between **Algeria** and **France** is to improve the available knowledge of the state of pollution in the Algiers district, including the bay and river waters, and to consider appropriate remedial techniques. The study will concentrate on hydrocarbons and phenols, which are an important cause of pollution in the Algiers area, being generated by the industrial and human activity there. The taste and odour of water are affected by very low concentrations of these pollutants. This project is led by Dr. Ahmed Ait Kaci, Université des Sciences et de la Technologie Houari Boumediene, **Algeria**, and Prof. Marek Rogalski, Université de Metz, **France**.
- Scientists from **Egypt** and **Belgium** are collaborating on the development of a sophisticated water management tool. Mathematical models are very powerful tools to support the management of the surface waters in a country, which are now frequently used for management of both flooding and water quality problems by national water authorities. Sources of water and of pollution relevant to the area in question have to be considered and integrated into any model. A methodology has been worked out at Leuven University using Belgian data, to which two Ph.D. students from Egypt contributed a large part during their studies in Belgium. Now back in Egypt they are working at two different water research institutes in Cairo. A NATO grant has allowed collaboration to be set up between the different institutions to refine and further develop the methodology, using different data, this time from the River Nile basin. The project is being led by Dr. Alaa El-Sadek of the Water Resources Research Institute, Cairo, **Egypt**, and Prof. Patrick Willems, Katholieke Universiteit Leuven, **Belgium**.
- The aim of a research project underway between collaborators in **Morocco** and the **United States** is to obtain qualitative and quantitative understanding of the role of "humic substances" on the transport of pesticides in the environment. Humic substances refers to a complex of mixes of different organic substances which most likely play an important role in changes of chemical behaviour of toxic heavy metals and pesticides. Efforts will focus mainly on two pesticides which are currently in use in Morocco (imidazolines and sulfonylureas). Representative samples of soil will be taken from different locations in Morocco. The results obtained from this research project will be used to develop strategies for the long-term groundwater protection measures to sustain a high water quality. The research teams are led by Prof. Mohammed El Azzouzi of the University Mohammed V, Rabat, **Morocco**, and Prof. Shahamat Khan of George Mason University, Virginia, **USA**.
- Researchers in **Tunisia** are involved in a multinational and multidisciplinary project aimed at evaluating a new generation of ultraviolet-lamp technologies for use in different UV water treatment systems, with potential for improving the quality of drinking water and agricultural irrigation systems in rural communities. Because of water scarcity all possible water sources must be mobilised in rural areas, including rainwater cisterns, groundwater wells, and wastewater recuperation. These non-conventional systems, however, pose the risk of disease transmission if they are improperly exploited. Ultraviolet disinfection of water and wastewater is a possible alternative to the current generally-used chlorination, which has disadvantages which include increasing concerns about cancer-causing byproducts. The research teams involved are led by Dr. K. Charrada, Monastir, **Tunisia**, Prof. V. Tarasenko, Tomsk, **Russia**, Prof. G. Zissis, Toulouse, **France**, Prof. F. Dawson, Toronto, **Canada** and Dr. W. Cairns, London, Ontario, **Canada**.
- **Israeli** scientists are involved in a project on geothermal wastewater. In small amounts boron is essential for plant growth, but becomes toxic when its concentration exceeds a critical value. The Kizildere-Denizli geothermal field in Turkey is being developed for electricity production and large amounts of processed water is disposed of, but the boron level is too high for the water to be used for irrigation of agricultural zones. Turkish researchers have recently performed laboratory and field tests for boron removal using ion exchange technology. This collaborative project aims to provide a viable large-scale solution to the problem of discharge of geothermal wastewater. This project is being led by Prof. N. Kabay from **Turkey**, Prof. Vladimir Teplayakov from **Russia**, Prof. M. Ryjak from **Poland**, Prof. Victor Starov from the **UK**, and Prof. Raphael Semiat from **Israel**.



Workshops on Security Issues of the Mediterranean Region

- Prince El Hassan Bin Talal of **Jordan** and Sir David Gore-Booth of the **United Kingdom** are the co-directors of a NATO Advanced Research Workshop dealing with **Emerging Threats to Energy Security and Stability**, which will take place in London, from 1-3 November. Energy security is a vital element in international stability. However, a variety of energy-related economic, technical and military/political factors pose serious challenges to the international community's pursuit of energy security and stability. This workshop will examine the strengths and vulnerabilities of the global energy production and distribution system. It will assess emerging threats to energy security and stability, and it will develop recommendations for energy security strategies to counter the threats posed by regional instability and terrorism. Experts and policy makers from key governments, international organizations and the private sector from eighteen countries will participate. Among key speakers scheduled to attend the workshop are Chris Patten, EU Commissioner for External Relations, Alan P. Larson, US Under Secretary of State, Economic, Business and Agricultural Affairs, and Alexi Miller, CEO, GAZPROM, Russia,
- The co-directors of an upcoming workshop on **The Role of Risk Assessment in Environmental Security and Emergency Preparedness in the Mediterranean Region** are Prof. Mustafa Emara, of **Egypt** and Dr. Benoit Morel, of the **United States**. This workshop will reflect the expertise and perspective of members of the Society for Risk Analysis, showing how to apply the analytical framework of risk analysis to environmental security and emergency preparedness and to other situations where limited environmental resources could result in major security threats. The objective of this workshop is to engage such persons-as well as others familiar with risk analysis in other applications-to build capacity in applying the tools of risk analysis to threats posed by limited environmental resources and to build adequate emergency preparedness plans and policies. The target audiences are government agency personnel and policy-makers, politicians, news reporters, and others who are likely to be engaged in preparing and responding to risks from limited environmental resources.

Other Public Diplomacy Activities in the Mediterranean Dialogue



The Outreach Countries Section of NATO's Public Diplomacy Division (PDD) is also fully engaged in NATO's Mediterranean Dialogue, and has been conducting cooperative projects since the outset of the Dialogue in 1994. The Mediterranean Dialogue reflects the Allies' view that security in Europe is closely linked to security in the Mediterranean region. The aim of the Dialogue is to promote better mutual understanding and confidence, as well as good and friendly relations across the Mediterranean. In addition, it helps correct misperceptions in Mediterranean Dialogue countries on NATO's policies and goals and it represents NATO's contribution to Mediterranean stability and security.

NATO PDD has brought together influential opinion leaders from the civil society of the seven countries through a series of conferences, seminars and visits to NATO Headquarters. Experts from think tanks and research organizations working in the political and security policy fields as well as parliamentarians from the foreign affairs and defence communities come together with the aim of promoting a free exchange of views on issues of common concern. A number of networks have thus been created, and permanent ties have been established between academics, senior scholars, parliamentarians and the media of NATO and Mediterranean Dialogue countries.

Among the high-level events organized by the Outreach and Partnership section of the former NATO Office of Information and Press, now part of the Public Diplomacy Division, are so-called Ambassadorial Conferences, bringing together senior scholars and academics with ambassadors from NATO and Mediterranean Dialogue countries in brainstorming sessions, exploring the future development of the Mediterranean Dialogue, most notably:

- NATO's Mediterranean Initiative: Policy Issues and Dilemmas (1997)
- The Future of NATO's Mediterranean Initiative: Evolution and Next Steps (1999)
- From Dialogue to Partnership; Mediterranean Security and NATO: Future Prospects (2002)

Further information on these and other events organized by the Outreach Countries section of PDD, as well as comprehensive information on NATO's Mediterranean Dialogue may be found on the Mediterranean Dialogue web page of the NATO web site at www.nato.int/med-dial/home.htm



First Meetings for new CCMS Pilot Studies

- The pilot study on Security of Narrow Waterways, Ports/Harbours and Adjacent Populated Areas held its first meeting, in Istanbul, Turkey, on 10-11 July. The study will examine the safety and security of specific maritime assets and strategic choke points that may face terrorist attacks. During the meeting, high, medium and low threat and risk levels were introduced and examples of critical choke points throughout the world were presented, emphasizing their relative importance and the criteria used to rank their risk level. Two working groups were formed: one to review existing international and national legislation and the second to review risk management approaches relevant to maritime assets. The United States has agreed to co-direct this pilot study, which is expected to last from three to five years. Representatives from Bulgaria, France, Georgia, Germany, Greece, Romania, Turkey and United States participated in the meeting. The next meeting will be held in March 2004 at the Joint Forces Command in Norfolk, VA, USA.
- The new pilot study on Prevention and Remediation Issues in Selected Industrial Sectors also held its first meeting, in Baia Mare, Romania, on 7-11 September. This study will define and explore the best practices for reducing the health and environmental impact on soil and groundwater from industrial sectors of interest (e.g. metal mining, organic chemical production, gasworks and fertilizer manufacturing) as well as other site "types" (e.g. old landfills, privatization sites, mega sites and shoreline sediment sites). Twelve countries were represented at this first meeting, as well as the European Union and the World Bank. Romania presented a Risk Assessment case study on the Aurul Tailing Pond and a case study on risk reduction of a mining accident in the Tisza Basin. The environmental impacts of the mining industry in Romania were also addressed. The EU representative explained the aim and mechanisms of the EU Mining project PECOMINES in Central and Eastern European countries and several presentations were made on national case studies by Belgium, Greece, Germany, Canada, the United Kingdom and the United States. The next meeting will be held in the United Kingdom early in 2004.

The Public Diplomacy Division

The restructuring of the international staff at NATO Headquarters which began following decisions taken at the Prague Summit in November 2002, is now complete. The restructuring included a merger of the **Scientific and Environmental Affairs Division** with the **Office of Information and Press**, to form a new **Public Diplomacy Division**. Mr. Jean Fournet, formerly Assistant Secretary General for Scientific and Environmental Affairs, became Assistant Secretary General for Public Diplomacy, with overall responsibility for the new Division. There are two Deputy Assistant Secretaries General one in charge of External Relations (Dr. Jamie Shea) and one in charge of Science Cooperation (Dr. Keith Gardner).

The work of the Division is steadily evolving, and the merger will help to create a more coherent picture, not only of the military and political dimensions of the Alliance, but also of the varied activities underway in NATO's Third Dimension - that is, the security-related actions taking place in the civilian arena, among which are the Science and Society activities.

The Science and CCMS programmes are structured within the Public Diplomacy Division as follows:

Cooperative Programmes Section

Dealing with topics in "hard sciences" and R&D cooperation, including Science Committee activities related to:

New Priority Research Topics* in Environmental and Earth Sciences, Physical Sciences, and Life Sciences, as well as Science for Peace projects.

Computer Networking Infrastructure projects and the Virtual Silk Highway also come under this section.

Threats and Challenges Section

Dealing with emerging threats and policy-oriented issues, including Science Committee activities related to:

New Priority Research Topics* in Security-Related Civil Science & Technology.

A new Science Policy and Social Sciences initiative will also come under this section.

The activities of the Committee on the Challenges of Modern Society (CCMS) are also within the section.

*See page 11

Other sections of the Public Diplomacy Division (PDD) are devoted to: NATO Countries, Outreach Countries, Publications and Distribution, and Press and Media. The Press and Media section is headed by the NATO Spokesman, who himself has direct responsibility to the NATO Secretary General.



Science Committee Proposes Revised Terms of Reference

The NATO Science Committee met in Ukraine, from 24-28 June, for a busy round of meetings which included two seminars with young 'leaders of tomorrow', and a full Science Committee session of the NATO-Ukraine Joint Working Group on Scientific and Environmental Cooperation.

The main item on the agenda of the Committee meeting itself was to finalise a review of the Science Programme which had been the subject of discussion and consultation for a number of months. In reviewing the future of the programme, the Committee drew up proposed new Terms of Reference, and issued a concept paper, setting out the goals and rationale for the Science Programme. The revised Terms of Reference are scheduled to be considered by the North Atlantic Council in the near future. Among the changes agreed at the meeting was one to rename the Science Programme to the NATO Programme for **Security Through Science**. The changes to the programme are outlined on pages 10 and 11, and further details may be found at our web site (www.nato.int/science).

The Committee also decided to expand the mandate of an existing sub-group to become a Ways and Means Sub-Group, which would meet periodically to consider policy issues and make recommendations for Science Committee approval.

The Committee welcomed their first woman colleague, Dr. Milada Glogarová, who had been appointed as representative for the Czech Republic (see page 2). A feature of this meeting also was the attendance for the first time of representatives of four of the invited countries as observers - Bulgaria, Romania, Slovakia and Slovenia. Representatives from the other invited countries, Estonia, Latvia and Lithuania, had not been in a position to attend this time.

Seminars Discuss NATO-Ukraine Cooperation

During the Committee's visit to Ukraine, two seminars were organised to which were invited young 'leaders of tomorrow', the first seminar was held in the premises of the Taras Shevchenko University in Kyiv, and the second at the city hall of Sevastopol.

At the Kyiv workshop issues of NATO-Ukraine relations, environmental security, industrial innovation and challenges for biotechnology in the defence against terrorism were addressed. The Sevastopol workshop was opened by the Mayor of Sevastopol and was mainly dedicated to the problems related to the pollution of the Black Sea and research activities, both those already accomplished and plans for the future. The achievements of the NATO Science Programme activities with respect to the protection of the Black Sea were highly appreciated by the audience.





Meeting of NATO-Ukraine Joint Working Group

The meeting of the NATO-Ukraine Joint Working Group on Scientific and Environmental Cooperation took place on 25 June 2003, co-chaired by Mr. Jean Fournet, Chairman of the Science Committee, and Prof. Andriy Gurzhiy, First Deputy Secretary of State, Ministry of Education and Science of Ukraine, and which was attended by Prof. Volodymyr Gorbulin, Head of the National Centre on Euro-Atlantic Integration, who also officially opened the meeting. For the first time the Working Group met in full Science Committee session, and in his welcoming address Prof. Gorbulin stressed his conviction that the NATO Science Programme is very important to the development of NATO-Ukraine relations.

Dr. Keith Gardner gave a presentation on the projected new orientations of the Science Programme, in which he underlined that one of the aims of the meeting was to identify Ukraine's priorities for scientific cooperation with NATO. In response to this, both Prof. Gurzhiy and Prof. Gorbulin emphasised that Ukraine was continuously trying to find synergies between the NATO Science Programme and other bilateral and multilateral



Prof. V. Gorbulin, Prof. A. Gurzhiy and Mr. J. Fournet in close consultation.

scientific cooperation programmes, and also identified the following fields as being of particular interest for NATO-Ukraine scientific cooperation:

- information technologies
- cell biology and biotechnology
- new materials and substances
- environmental protection
- rational use of natural resources

Prof. Gorbulin raised Ukraine's concerns about brain drain and the belief that the proper conditions must be created to ensure that young scientists returned to Ukraine after studying or working abroad. He remarked that developing scientific cooperation with NATO was considered one possible mechanism to enhance Ukraine's scientific potential. The Working Group was pleased to note his assertion that Ukraine supported with additional finance the

Ukraine scientists who had received grants from NATO, and that Ukraine was taking the necessary steps to ensure that NATO grants were fully exempt from taxes.

Earthquake Remediation Initiative Demonstrated in Skopje



Demonstrating a new earthquake-resistant wall panel for insertion into existing buildings

A Science for Peace (SfP) project on **Seismic Assessment and Rehabilitation of Existing Buildings**, which resulted from a special initiative of the Science Committee following the severe earthquakes in Istanbul and Athens in 1999, has been featured at commemorations to mark the anniversary of another devastating earthquake in the region - in Skopje, the former Yugoslav Republic of Macedonia*, in 1963. As part of the events surrounding a conference to mark 40 years of European earthquake engineering and successful city reconstruction, the SfP project team mounted a demonstration of earthquake resistant panels that can be inserted into existing buildings diagnosed as being too weak to withstand such seismic activity. Attended by the Deputy Minister of Science and Education, and by the US and Netherlands Ambassadors to Skopje, the demonstration attracted sizeable attendance from

among the 200 participants at the conference. The research teams are led by Prof. G. Özcebe, Middle East Technical University, Ankara, Turkey, Prof. J.O. Jirsa, University of Texas at Austin, USA, Prof. K. Pitilakis, Center for Research and Technology, Thessaloniki, Greece, Prof. M.N. Fardis, FORTH, Patras, Greece, and Prof. M. Garevski, University Ss Cyril and Methodius, Skopje.

*Turkey recognises the Republic of Macedonia with its constitutional name.



SCIENCE FOR SECURITY, STABILITY AND SOLIDARITY A SCIENCE PROGRAMME TRANSFORMED

Readers of the Newsletter will know that for some time now the NATO Science Committee and all concerned with the NATO Science Programme have been engaged in discussion and consultation on the future of the programme, in light of the changes that have taken place in world security and which have been reflected in a transformed NATO Alliance. The NATO summit meeting in Prague in November 2002, endorsed these transformations, and agreed new NATO strategic objectives. The NATO Science Programme has now been transformed in its turn, and we present here the essential elements of the changes foreseen for the programme in 2004 and beyond.

NATO Programme for Security Through Science

The transformation begins with the name of the programme - it will henceforth be known as the NATO Programme for Security Through Science. A new name has been chosen so as to better reflect the aims of and reasons for the programme, and to help emphasise the fundamental change which has taken place.

The aim of the new programme on Security Through Science is to contribute to security, stability and solidarity among nations, by applying cutting-edge science to problem solving. This is accomplished through collaboration, networking and capacity-building, while at the same time catalyzing democratic reform and supporting economic development in Partner countries.

The need for change results primarily from the rapid evolution of NATO's roles and objectives. It also reflects the increasing need for scientific advice to an Alliance facing new scientific and technological challenges

The NATO Science Programme has contributed to an environment of stability and solidarity in Alliance and Partner countries. Direct initiatives focused on security now signal a new dimension. New priority support areas will include, among others, scientific collaboration for defence against asymmetric threats and challenges; scientific collaboration to counter other threats to security; technology sharing and transfer to address partner country priorities; and addressing relevant societal issues. A new approach to Science Fellowships aims at reintegrating Partner scientists into their home countries.

The change in practice

The main change to the programme that affects most closely the scientific community of NATO, Partner and Mediterranean Dialogue countries is that in future support will be offered for collaboration **only** in priority research topics in:

1. Defence Against Terrorism
2. Countering Other Threats to Security
3. Technology Transfer to Address Partner Country Priorities

This will apply not only to the traditional collaborative support mechanisms of Collaborative Linkage Grants, Expert Visits, Advanced Study Institutes and Advanced Research Workshop, but also to the Science for Peace projects.

Science for Peace will issue a new Call for Proposals before the end of 2003, for planning grants for R&D projects in the Priority Research Topics in 2004. Mediterranean Dialogue countries will for the first time be eligible for support under the Science for Peace programme.

In 2004, there will be no change in the principle that support is offered for collaboration between scientists in NATO-countries and those in Partner or Mediterranean Dialogue countries. The familiar Advisory

Panels drawn from the scientific community will continue to screen applications in the peer review system, grouped into Environmental and Earth Sciences, Life Sciences, Physical Sciences, and Security-Related Science and Technology. However, as already noted, support will no longer be available for all areas of science. Only applications in Priority Research Topics in Defence Against Terrorism, or Countering Other Threats to Security, or in priority areas identified by Partner countries, will be considered for support.

The list of Priority Research Topics is given on the following page. Further information on the changes, as well as operational details, may be found at the NATO Science web site (www.nato.int/science).



NATO PROGRAMME FOR SECURITY THROUGH SCIENCE

PRIORITY RESEARCH TOPICS

Scientific Collaboration for Defence Against Terrorism

The priority research topics in the area Defence Against Terrorism are concerned with the science involved in, for example, progress in detecting chemical, biological or radiological nuclear weapons or agents, or with physical protection against such weapons. Improved decontamination possibilities are also needed, as well as improved methods of safe destruction for these types of weapons or agents. Progress in medical responses to counteract such weapons will also be sought, for example chemical and vaccine technologies. Measures

to protect against eco-terrorism and computer terrorism are two more areas earmarked for concentrated study. The list of topics is as follows:

- Rapid Detection of Chemical, Biological, Radiological Nuclear (CBRN) Agents and Weapons, and Rapid Diagnosis of their effects on people
- Novel and rapid methods of detection (e.g., chemical and biosensors, multisensor processing, gene chips)
- Physical Protection against CBRN agents
- Decontamination of CBRN agents
- Destruction of CBRN agents and weapons
- Medical Countermeasures (e.g., chemical and vaccine technologies)
- Eco-Terrorism Countermeasures
- Computer Terrorism Countermeasures

Scientific Collaboration to Counter Other Threats to Security

The priority research topics on Countering Other Threats to Security are in less obviously dangerous fields, but are in areas which nevertheless pose a risk to security and stability, particularly in a regional context, and scientific and technical studies are key. One such is environmental security, where desertification, land erosion or pollution of common waterways can lead to regional or cross-border disputes. Water resources management, or management of other, non-renewable, resources are two more examples of problems for which solutions must be found. Reliable scientific models of sustainable consumption of food, energy or materials need to be developed, to include fiscal measures

and environmental costings. Being able to forecast disasters, or better still prevent them, would lead to a safer world. The reliance of modern society on the provision of safe food or on secure and reliable information means that their availability must be assured, and indeed there are many areas of social sciences which must be studied in the effort to make society more secure. The list of topics is as follows:

- Environmental Security (e.g., desertification, land erosion, pollution, etc.)
- Water Resources Management
- Management of Non-Renewable Resources
- Modeling Sustainable Consumption (e.g., food, energy, materials, fiscal measures and environmental costings)
- Disaster Forecast and Prevention
- Food Security
- Information Security
- Social Science Topics

Technology Transfer to Address Partner Country Priorities

Among the priority research topics will be topics specially selected by Partner countries, with an emphasis on **Technology Transfer to Address Partner Country Priorities**. A process of consultation with Partner countries through the EAPC Science Committee has begun, and a list will shortly be drawn up of the priority areas identified by Partner countries. Scientists from these countries will then be able to propose collaboration with NATO-country colleagues either in the priorities of their own countries or in

the above priority topics in Defence Against Terrorism or Countering Other Threats to Security.

At the meeting of the NATO-Ukraine Joint Working Group on Science and Technology, in June reported on elsewhere in this Newsletter, a list of priority areas for Ukraine was drawn up, and may be found on page 9.



2003 NATO Science Partnership Prize

Russia-US collaboration produces breakthrough in ophthalmic research

Dr. Andrey Larichev (Russia) and **Dr. Leonard John Otten** (USA) are the joint winners of the 2003 NATO Science Partnership Prize, for their collaboration through a NATO Science for Peace grant on development of a new high resolution imaging system used in examining the human retina. The Prize will be awarded to them by NATO Secretary General **Lord Robertson** at a **Prizegiving ceremony at NATO Headquarters on 22 October 2003**.

The development of this new High Resolution Spectral Fundus Imager represents a revolutionary step forward in the field of clinical in-vivo imaging of the retina and retinal substructures. The quality of the images produced shows for the first time in a living human eye features that had previously only been observed in dissected organs. A broad range of eye diseases that represent leading causes of visual impairment or blindness can now be studied in the clinical environment. Former instruments for retinal imaging took up huge areas of research laboratories; the system developed under the NATO grant miniaturized the technology to the size of a shoe box, and reduced the costs to commercially viable levels.

The researchers involved are now recognized as a leading international research team in the field of ophthalmic imaging. A further grant from the US National Eye Institute has enabled research to continue following the original developments under the NATO grant, and has allowed construction of the first clinical prototypes of the device. Over 1.2 million dollars-worth of new business has already been generated. Russian participants are now manufacturing copies of the equipment and selling them in the United States and Russia, and a new export avenue has been opened for a major optical manufacturer in Zagorsk, Russia, which

was previously closed to them because of US medical instrumentation certification requirements, now overcome through the NATO sponsorship. The partnership has resulted in the signing of multi-year contracts between the US Kestrel Corporation and two of the collaborating institutes in Russia to support research and component development in an expansion of the research begun under the NATO grant.

The project aptly fulfilled the original objectives of the NATO Science for Peace programme, which supported projects of high quality applied science and technology with excellent potential for commercialization. It involved real cooperation between US and Russian experts and used modern management practices. There was a realistic agreement on Intellectual Property Rights between the partners, which benefited both the Russian and the US researchers, and was protected by both Russian and US patents. It also attracted substantial additional funds from other organizations.

Two further notable features of the prizewinning partnership are that the project has involved the conversion of former military research and technology in Russia to civilian applications; and the new imaging device also has the potential to be used for biometrics applications, which will allow highly-reliable personal identification for security and counter-terrorism purposes.

Andrey Larichev is from the Institute on Laser and Information Technologies of the Russian Academy of Sciences, Shatura, Moscow Region, and **Leonard Otten** is from the Kestrel Corporation, Albuquerque, New Mexico. They were awarded the NATO Science for Peace grant in 1999.

The Virtual Silk Highway successfully completed



Good news from Ashgabat. We have installed satellite dish and have established connection to Hamburg today. Photos will be ready on Monday. Best regards ...

With these short words from the Virtual Silk Highway team, sent by e-mail from **Ashgabat, Turkmenistan** on 22 August 2003, a major endeavour by the NATO Science Programme came to a successful conclusion. More than three years after the first ideas about such an ambitious project were aired during the meeting of the

Computer Networking Panel in Tashkent, Uzbekistan in June 2000, and exactly one year after the good news was received from the Virtual Silk Highway team that the first satellite dishes had been installed successfully in Tashkent, Uzbekistan, the set-up of the Silk Network was complete. Over a period of one year, and ahead

of the original installation schedule, all eight "Silk countries" in the southern Caucasus and Central Asia, have received their satellite and networking equipment and have been successfully connected to the Internet.

The first country to be connected to the network, in August 2002, was **Uzbekistan**. This was followed in January 2003 by the link to the **Kyrgyz Republic**, and in quick succession, by the end of February 2003, **Tajikistan** and **Armenia**. Following a short delay while some technical problems were resolved, the next country to be connected was **Azerbaijan**, in May 2003, which was followed by **Georgia** in June, by **Kazakhstan** in July, and finally by **Turkmenistan** in August 2003. Detailed information may be found on the NATO or Silk project web sites (www.nato.int/science or www.silkproject.org/).

Meanwhile, the 'Silk Board' is already thinking about possible future extensions of the network, within the constraints of its budget. For example, connectivity outside the capitals is high on the priority list of the local network administrators in many countries. Another example is the need for regional connectivity within a new 'University of Central Asia', which by the end of this year plans to open three campuses in mountainous regions of Tajikistan, Kyrgyz Republic and Kazakhstan.

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