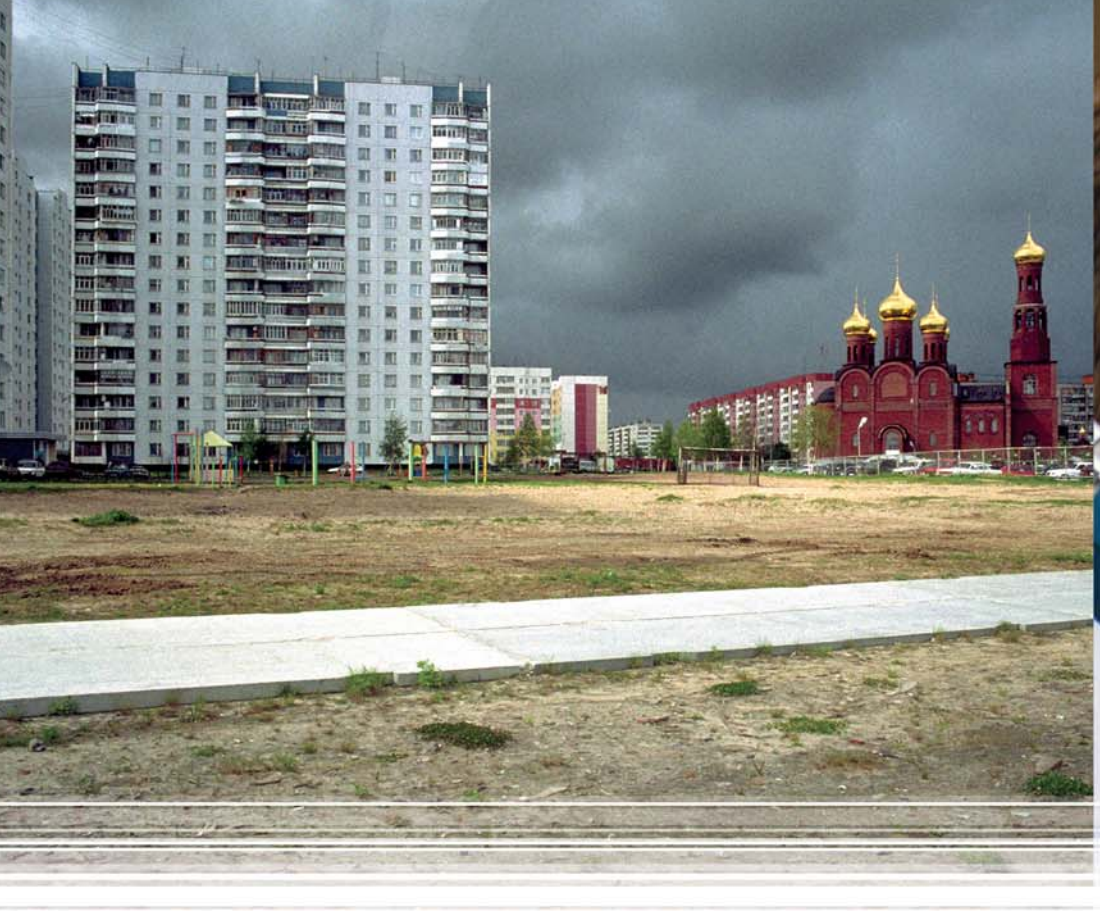


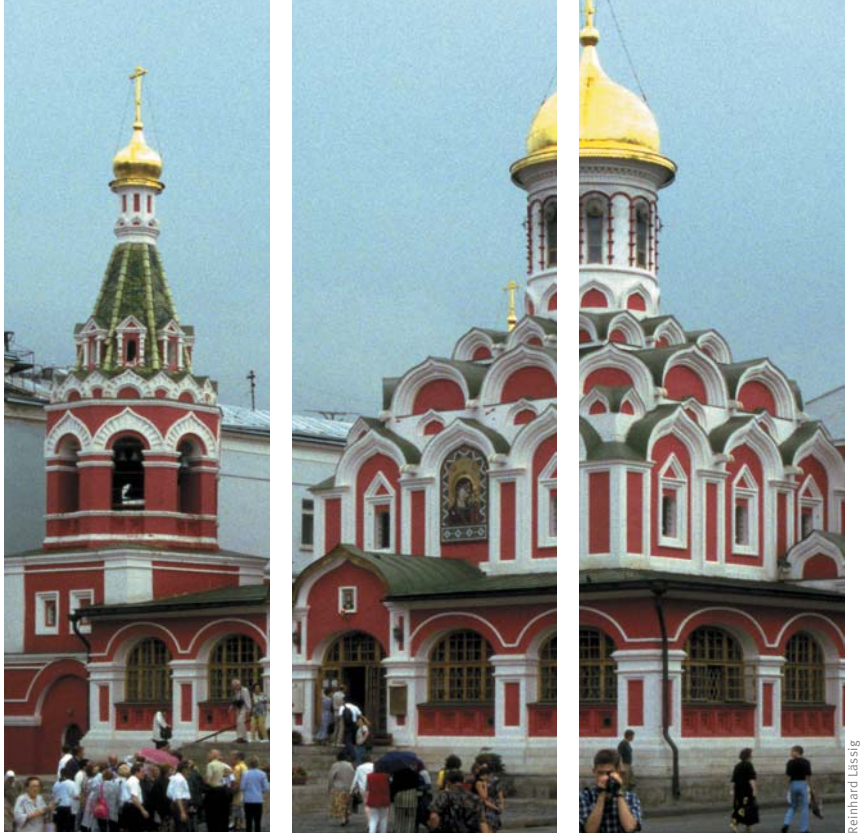
Scientific co-operation with Eastern Europe

A Swiss contribution to the countries in transition Experiences and results

FNSNF
FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

DEZA DIREKTION FÜR ENTWICKLUNG UND ZUSAMMENARBEIT
DDC DIRECTION DU DÉVELOPPEMENT ET DE LA COOPÉRATION
DSC DIREZIONE DELLO SVILUPPO E DELLA COOPERAZIONE
SDC SWISS AGENCY FOR DEVELOPMENT AND COOPERATION
COSUDE AGENCIA SUIZA PARA EL DESARROLLO Y LA COOPERACIÓN

Successful research co-operation with Eastern Europe



Reinhard Lässig

Over a period of years Switzerland has been demonstrating its solidarity with the transition countries of the former Eastern Bloc in an impressive manner. Since the dismantling of the Iron Curtain, it has spent more than three billion Swiss francs on promoting human rights and the rule of law, establishing and consolidating democratic systems and providing sustainable support for economic and social development in these countries.

Science has been doubly affected by the changes in Eastern Europe over the last 15 years. Like many other sectors of society, science has suffered as a result of the sometimes dramatic upheavals that have taken place; on the other hand, it has been able to make an important contribution towards its successful management. This is why Switzerland has committed itself to supporting Eastern Europe in the field of science as well as in other areas. The hallmark of this commitment is the combination of research funding and technical co-operation within the framework of Swiss federal aid to Eastern Europe. Thus in 1990, the Swiss Agency for Development and Cooperation (SDC) and the Swiss National Science Foundation (SNSF) inaugurated a joint programme of scientific co-operation with Eastern Europe. Since 2000, the programme has been known as SCOPES – Scientific Co-operation between Eastern Europe and Switzerland.

This brochure provides an insight into the achievements and experiences that SCOPES has generated. It contains contributions from Swiss researchers who have co-ordinated the many projects in a spirit of immense enthusiasm and with only a minimum of financial compensation, thereby strengthening co-operation between Switzerland and Eastern Europe. There are also reports from scientists from the transition countries, for whom SCOPES has often constituted a genuine opportunity in a difficult environment.

We have double reason to be satisfied. First, external evaluations have shown that SCOPES is helping the countries of Eastern Europe make the transition to democracy and a social market economy. Conversely, the programme gives Swiss scientists access to other research communities and new scientific challenges. Both developments are to be welcomed and they also document the longstanding co-operation between the SNSF and the SDC which is based on complementarity of skills.

Dieter Imboden

President National Research Council
Swiss National Science Foundation

Walter Fust

Director
Swiss Agency for Development and Cooperation

In a nutshell

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East-west research benefits both sides

When the Iron Curtain fell in 1990 and the first east-west research collaborations were just starting up, many scientists in the West were not sure that it would benefit both sides. Nearly 15 years later, most of those who took the big step towards a different way of doing science can look back on many successful years of research. Examples of projects show that reciprocal expectations were met and that collaboration does benefit both sides.

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Reinforcing and networking research competencies

A review of the collaboration between Switzerland and countries in Eastern Europe to date shows that many institutes and researchers from the East have overcome their scientific isolation. The scientific skills of many Eastern European teams and institutes have improved and many researchers are equal partners for their western colleagues. Many scientists from the East are extremely satisfied for their projects improved both their level of qualification and their work.

Diverse nature – threatened environment

Most of the Swiss researchers active in east-west projects are fascinated by the pristine quality of the countryside between Tirana and Sachalin. However, these natural riches of high scientific value are under threat: in many places air, water and soil are heavily polluted. Scientists from the East and the West have been trying to assess both natural values and environmental risks. In the Aral Sea region, for example, they were investigating how the water level of the Sea can be controlled. The model tested could also be used in other countries and continents.

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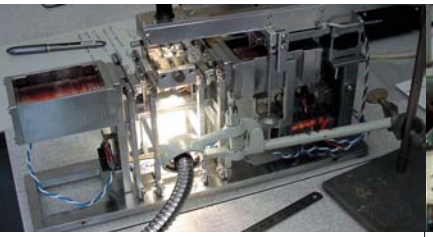
Sustainable regional development

Changes in political and economic objectives as well as the smaller territorial size of many of the successor states in Eastern Europe are forcing them to modify their spatial structures. New questions arose in many regions, e.g. about urban and regional development, mobility and land use. There is a great demand for scientists with new competencies in future-oriented regional development. Therefore, for some universities in Eastern Europe the first step was to invest in training and to draw up new curricula.



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Different perspectives encourage innovation

Many of the research projects linking East and West have produced some novel results. Innovative findings frequently emerge in situations in which experts work together interdisciplinarily. The scientists' different origins, cultural backgrounds and complementary skills can be important factors for success. These differences often enough provide new impetus for research. Innovative researchers often work at the cutting edge and open the door to others. Many of them came to the conclusion that there are valuable expertise and some real jewels to be found on each side.

Researching for better health

Once the Berlin Wall came down, the health systems in most of the eastern countries went into a rapid decline. The medical infrastructure was hopelessly outdated and there was no money for new equipment. Collaboration with doctors and scientists from the West helped to improve and to promote research in the East. The experiences Swiss partners gained in Eastern Europe are important for the implementation of practical health care in Switzerland.

Changing societal values

Since the end of state socialism, social and political life in the countries of Eastern Europe is no longer the same. People and institutions are caught up in processes of radical change. The change in familiar values and structures is determining political and social events. More and more people are playing a role in shaping processes. This is affecting legal norms and government policies, migration, the economy and the labour market. Meeting current needs, the social sciences have become more diversified and, therefore, more attractive to organisations concerning the employment of social scientists.

Preserving cultural and religious assets

Political and economic change sometimes takes place very rapidly. Culture and religion, by contrast, often remain constant factors through the ages. The opening up of Eastern Europe has granted researchers new access to religious roots and ancient cultural legacies, i.e. music and historic monuments. Swiss scientists found that with respect to their cultural heritage many of the Eastern European countries are not just scientifically interesting; they are also fairly rich.

SCOPES in brief

The dismantling of the Iron Curtain and economic decline threatened to impoverish the scientific structures of many Eastern European countries. Switzerland was quick to recognise the problems this could cause and took appropriate action. In 1990, the Swiss Agency for Development and Cooperation (SDC) and the Swiss National Science Foundation (SNSF) launched their first SCOPES programme to provide support for scientific activities in Eastern Europe. And this successful commitment is to be continued: a call to submit new research proposals for the new SCOPES Phase 2005–2008 was announced in January 2005.

Reinhard Lässig

The Eastern European countries are quickly developing. Not only politics, economy and society but also science is changing rapidly. Road works in Yekaterinburg.

SCOPES – Scientific Co-operation between Eastern Europe and Switzerland represents 15 years of joint commitment by the SNSF and the SDC. More than CHF 33 million have been invested in accordance with competitive principles in some 1500 research projects and other initiatives that pursue three objectives in the countries involved:

- To manage transition problems
- To improve general conditions governing scientific research and thereby enhance the performance of the research system
- To promote Eastern European research groups and institutions.

Since being launched, the SCOPES programme has had to adapt to changing conditions. There has, for instance, been a growing shift in geographical focus towards the East, including Central Asia. Therewith the rapprochement between various countries and the European Union has had to be taken into account. While only Poland, Slovakia, the Czech Republic and Hungary were entitled to take part in the first phase, the 2005–2008 programme has been extended to a total of 16 countries. Participating states that are now EU members are no longer included in the programme.

The range of funding instruments has also been gradually adapted to changing needs. Until 1995, support had been provided for a large number of small research projects, exchange of researchers and participation in conferences. Current efforts are focused on two main instruments that account for some 90% of available resources. In *Joint Research Projects*, groups of scientists from Eastern Europe together with partners in Switzerland conduct specific research aimed at expanding the boundaries of knowledge. The second instrument, *Institutional Partnerships*, aims at modernising the research environment that is so important for the successful realisation of research projects. Here Swiss-based partners support their Eastern European counterparts at various institutional levels, for instance in implementing restructuring measures.

These two instruments are supplemented by *Conference Grants*, i.e. funding of participation by Eastern European researchers in international scientific conferences staged in Switzerland. Such participation is a valuable contribution to the international networking that is a precondition for a successful career in research. Finally, SCOPES also awards *Valorisation Grants* to help translate the results of the Joint Research Projects and the Institutional Partnerships into practice.

The implementation of the SCOPES programme is based on three guiding principles:

- All activities are based on co-operation between Swiss and Eastern European researchers. However, an average of 85% of the financial resources is awarded directly to the partners in Eastern

Reinhard Lässig

Alexandra Stark

Alexandra Stark

Newcomers to Eastern Europe immediately discover new habits concerning daily life, culture, language and writing: Chemist's shop in Namangan, Fergana valley of Uzbekistan (left); a young women's folk group is preparing for a performance (right).

Reinhard Lässig

Many cities in Eastern European countries welcome visitors with a monumental sign of the city's name.

Europe. The Swiss researchers involved are recompensed only for the co-ordination costs involved and therefore their personal contributions are very considerable. In return, however, they gain access to other research communities and new scientific challenges.

– An open approach is adopted for the award of SCOPES grants. Thus all scientific disciplines are included, and researchers are not tied to specific topics in the proposals they submit. In the 2005–2008 phase, the areas of i) Humanities and Social Sciences, ii) Mathematics, Natural and Engineering Sciences and iii) Biology and Medicine will each be awarded approximately one third of the budget.

– Despite the open approach to awarding grants, projects submitted to SCOPES are assessed for their relevance to transition and their focus on outcomes, two essential criteria of Swiss federal support for Eastern Europe. In other words, the projects must do more than generate findings of purely academic interest and they must make a genuine contribution towards solving the problems with which transition countries are confronted.

External experts have confirmed that the SCOPES programme makes an important contribution towards managing the upheavals to which the countries of Eastern Europe have been exposed. Besides generating a large number of valuable scientific findings, SCOPES-funded projects have yielded many results which are of relevance to transition and which can be translated into practice. This brochure provides an insight into what SCOPES has achieved and the personal experience of people who contributed to the success of the programme between 1996 and 2004. It is as representative as possible, and all involved countries and the most important disciplines and research topics have been included.

SCOPES in Kürze

Reinhard Lässig

Mit dem Fall des Eisernen Vorhangs und dem wirtschaftlichen Niedergang vieler osteuropäischer Länder drohte das Ausbluten der osteuropäischen Wissenschaftssysteme. Die Schweiz hat die damit verbundenen Probleme rasch erkannt und entsprechend gehandelt. So lancierten die Direktion für Entwicklung und Zusammenarbeit (DEZA) und der Schweizerische Nationalfonds zur Förderung der wissenschaftlichen Forschung (SNF) 1990 ihr erstes Programm SCOPES zur Unterstützung der Wissenschaft in Osteuropa. Und das bisher erfolgreiche Engagement dauert an, wurde doch im Januar 2005 die neue SCOPES-Phase 2005–2008 ausgeschrieben.

SCOPES – Scientific Co-operation between Eastern Europe and Switzerland steht für 15 Jahre gemeinsames Engagement von SNF und DEZA. Mehr als 33 Millionen Franken wurden nach dem Wettbewerbsprinzip in rund 1500 Forschungsprojekte und weitere Initiativen investiert, mit denen in den beteiligten Ländern drei Ziele verfolgt wurden:

– Bewältigung der Schwierigkeiten der Transition
– Verbesserung der Rahmenbedingungen und dadurch Steigerung der Leistungsfähigkeit des Forschungssystems
– Förderung von osteuropäischen Forschungsgruppen und -institutionen

Das Programm SCOPES wurde seit seiner Lancierung laufend neuen Entwicklungen angepasst. So verschob sich der geografische Fokus zusehends ostwärts bis nach Zentralasien. Damit wurde der Annäherung zahlreicher Länder an die Europäische Union Rechnung getragen. Während in der ersten Phase nur die Länder Polen, Slowakei, Tschechien und Ungarn teilnahmeberechtigt waren, richtet sich die Phase 2005–2008 an 16 Länder. Die mittlerweile der EU beigetretenen osteuropäischen Länder schieden aus dem Programm aus.

Auch die Palette an Unterstützungsmassnahmen wurde sukzessive angepasst. Bis 1995 wurden zahlreiche kleine Forschungsprojekte, Personenaustausch und Konferenzteilnahmen unterstützt. Heute dagegen konzentriert sich das Engagement auf zwei wesentliche Massnahmen, für welche rund 90% der verfügbaren Fördermittel eingesetzt werden. Im Rahmen von *Gemeinsamen Forschungsprojekten* führen Forschungsgruppen aus Osteuropa gemeinsam mit Partnern in der Schweiz spezifische, an Erkenntnisgewinn orientierten Forschungsprojekte durch. Die *Institutionellen Partnerschaften* streben dagegen eine Modernisierung des Forschungsumfeldes an, dem für eine erfolgreiche Durchführung von Forschungsvorhaben grosse Bedeutung zukommt. Partner aus der Schweiz unterstützen hierbei osteuropäische Kolleginnen und Kollegen auf verschiedenen institutionellen Ebenen, beispielsweise bei der Realisierung von Umstrukturierungsmassnahmen.

Ergänzt werden diese beiden Instrumente durch *Konferenzbeiträge*, also der Finanzierung der Teilnahme von osteuropäischen Forschenden an internationalen wissenschaftlichen Konferenzen in der Schweiz. Dies ist ein wichtiger Beitrag für ihre internationale Vernetzung, da sie Voraussetzung für eine erfolgreiche Forschungskarriere ist. Schliesslich werden im Rahmen von SCOPES auch *Umsetzungsbeiträge* gesprochen, um den Transfer relevanter Resultate aus den gemeinsamen Forschungsprojekten und institutionellen Partnerschaften in die Praxis zu fördern.

Reinhard Lässig

Reinhard Lässig

Christoph Scheidegger

Linke Seite: In grossen Wohnkomplexen wie hier in Nižnevartovsk, Westsibirien, wohnen mehrere Tausend Menschen.

Links: Das Bild vieler osteuropäischer Grossstädte, im Bild Yekaterinburg, wird von grossen Plattenbau-Siedlungen geprägt.

Mitte: In viele partnerschaftlich durchgeführte Forschungsprojekte sind auch öffentliche Verwaltungen eingebunden, die zum Teil erst den Zutritt zu Landschaften, Wäldern oder Schutzgebieten ermöglichen.

Rechts: Nach der Forschungsarbeit ist das gesellige Zusammensein ein Muss: Forschende aus der Schweiz wurden in Osteuropa fast überall von der grossen Gastfreundschaft überrascht.

Richtschnur für die Implementierung von SCOPES bilden drei Elemente:

– Sämtliche Aktivitäten werden in Zusammenarbeit von schweizerischen und osteuropäischen Forschenden durchgeführt. Durchschnittlich 85% der finanziellen Mittel kommen jedoch direkt den Partnern in Osteuropa zu Gute. Die Forschenden aus der Schweiz, welche nur für ihren Koordinationsaufwand entschädigt werden, erbringen somit sehr grosse Eigenleistungen. Sie erhalten dafür Zugang zu einer anderen Forschergemeinschaft und neuen wissenschaftlichen Fragen.

– Im Rahmen von SCOPES wird grundsätzlich ein offener Förderansatz verfolgt. Somit fallen sämtliche wissenschaftlichen Disziplinen ins Förderspektrum, und die Forschenden sind thematisch in ihren Gesuchseingaben nicht gebunden. In der Phase 2004–2008 ist geplant, den Fachbereichen i) Geistes- & Sozialwissenschaften, ii) Mathematik, Natur- & Ingenieurwissenschaften sowie iii) Biologie & Medizin je rund ein Drittel zukommen zu lassen.

– Trotz thematisch offenem Förderansatz werden SCOPES-Aktivitäten an ihrer Transitionsrelevanz und ihrer Wirkungsorientierung gemessen, beides wesentliche Prinzipien der Osthilfe des Bundes. Sie sollen somit über Resultate von rein wissenschaftlichem Interesse hinausgehen und konkrete Beiträge zur Lösung der Probleme liefern, mit denen sich die Transitionsländer konfrontiert sehen.

Aussenstehende Experten haben SCOPES mehrmals attestiert, einen wichtigen Beitrag zur Bewältigung der Umwälzungen in Osteuropa zu leisten. Die durch SCOPES unterstützten Aktivitäten lieferten sowohl zahlreiche wertvolle wissenschaftliche Erkenntnisse als auch viele transitionsrelevante und in der Praxis anwendbare Resultate. Die vorliegende Broschüre vermittelt einen Eindruck vom Geleisteten und den individuellen Erfahrungen von Menschen, welche zwischen 1996 und 2004 zum Erfolg von SCOPES beitrugen. Dabei wurde Wert auf eine möglichst repräsentative Darstellung unter Einbezug aller Länder und der wichtigsten Fach- und Problembereiche gelegt.

SCOPES en bref

Reinhard Lässig

La Datcha fait toujours partie du quotidien des habitants de nombreux pays de l'Est. On y cultive avant tout des légumes et des fruits tout comme on y passe ses vacances et ses week-ends.

Suite à la disparition du rideau de fer et à la dégradation économique de nombreux pays de l'Europe de l'Est, le système scientifique est-européen risquait d'être saigné à blanc. La Suisse a alors rapidement pris conscience des problèmes que cette situation pouvait engendrer et a réagi en conséquence. C'est ainsi que la Direction du développement et de la coopération (DDC) et le Fonds national suisse de la recherche scientifique (FNS) ont lancé, pour la première fois en 1990, le programme SCOPES afin de soutenir la science en Europe de l'Est. Cet engagement, très apprécié des scientifiques, continue et la nouvelle phase SCOPES 2005–2008 a été mise au concours.

SCOPES – Scientific Co-operation between Eastern Europe and Switzerland – représente 15 ans d'engagement de la DDC et du FNS. Plus de 33 millions de francs ont été investis, selon le principe de la concurrence, dans quelque 1500 projets de recherche et d'autres initiatives qui ont visé trois objectifs dans les pays participants:

– Surmonter les difficultés de la transition

– Améliorer les conditions cadre et par là augmenter les capacités du système de la recherche

– Encourager les groupes et institutions de recherche de l'Europe de l'Est

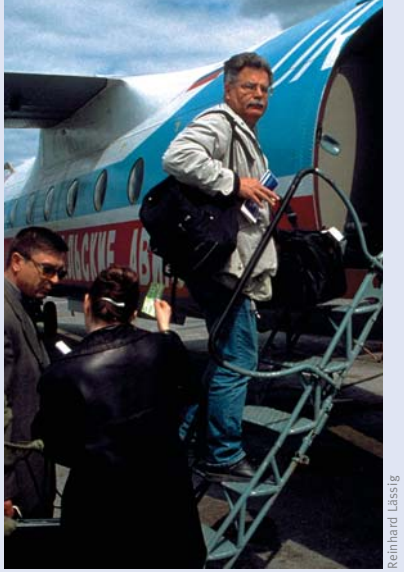
Depuis son lancement, le programme SCOPES a été continuellement adapté aux nouveaux développements. Ainsi, la liste des pays concernés par le programme a été modifiée à chaque mise au concours, la priorité se déplaçant toujours plus vers l'est, jusqu'en Asie centrale aujourd'hui. Le rapprochement de nombreux pays de l'Est avec l'Union européenne a donc été pris en considération. Alors que dans la première phase seules la Pologne, Slovaquie, Tchéquie et Hongrie étaient habilitées à participer, la phase 2005–2008 s'adresse à 16 pays. Les pays est-européens qui ont entre-temps adhéré à l'UE sont maintenant exclus du programme.

La palette des mesures de soutien a aussi été successivement actualisée. Jusqu'en 1995 ont été soutenus de nombreux petits projets de recherche, des échanges de personnes et des participations à des conférences. Par contre, l'engagement se concentre aujourd'hui sur des instruments plus importants, pour lesquels environ 90% des moyens disponibles sont engagés. Dans le cadre des *Projets communs de recherche*, des groupes de recherche de l'Europe de l'Est réalisent conjointement avec des partenaires de Suisse des projets de recherche spécifiques orientés vers l'acquisition de connaissances. Les *Partenariats institutionnels* visent, eux, à moderniser les conditions de recherche, étape nécessaire en vue de réaliser avec succès des projets de recherche. Les partenaires de Suisse soutiennent de cette manière des collègues d'Europe de l'Est à différents niveaux institutionnels, par exemple lors de la réalisation de mesures de restructuration.

Ces deux instruments sont complétés par des *Subsides de conférences*, c'est-à-dire le financement de la participation de chercheuses et chercheurs d'Europe de l'Est à des conférences scientifiques internationales en Suisse. C'est là une contribution importante pour leur mise en réseau internationale, condition *sine qua non* du succès d'une carrière scientifique. Enfin seront également octroyés dans le cadre de SCOPES des *Subsides de valorisation*, afin d'encourager le transfert dans la pratique des résultats pertinents issus des projets communs de recherche et des partenariats institutionnels.

Reinhard Lässig

Dans de nombreuses villes, des églises fermées jusqu'en 1990 ont été rénovées et accueillent à nouveau les fidèles.



Reinhard Lässig

Reinhard Lässig

La mise en oeuvre de SCOPES se base sur trois principes:

- Toutes les activités sont réalisées en collaboration par des chercheuses et chercheurs de Suisse et d'Europe de l'Est. Toutefois 85% des moyens financiers sont en moyenne directement attribués aux partenaires est-européens. Les scientifiques de Suisse, qui ne sont dédommagés que pour leurs frais de coordination, fournissent ainsi d'importantes prestations propres. Ils reçoivent en retour l'accès à une autre communauté de recherche et à de nouvelles questions scientifiques.

- Toutes les disciplines scientifiques peuvent être soutenues et les chercheuses et chercheurs ne sont pas liés thématiquement dans leurs demandes de soutien. Il est prévu, dans la phase 2005-2008, de consacrer à chacun des domaines i) sciences humaines & sociales, ii) mathématiques, sciences naturelles & de l'ingénieur de même que iii) biologie & médecine environ un tiers des moyens.

- Les activités SCOPES sont évaluées selon leur pertinence pour la transition et leur orientation vers l'efficacité, deux principes essentiels du soutien de la Confédération aux pays de l'Est. Elles devraient ainsi dépasser les résultats d'intérêt purement académique et livrer une contribution concrète à la solution des problèmes, auxquels sont confrontés les pays en transition.

Des experts indépendants ont plusieurs fois confirmé que SCOPES apportait une contribution importante pour maîtriser les bouleversements en Europe de l'Est. Les activités soutenues par SCOPES ont livré aussi bien de nombreuses connaissances scientifiques de valeur que d'abondants résultats pertinents pour la transition et applicables dans la pratique. La présente brochure souhaite donner une vue d'ensemble de ce qui a été accompli et relater des expériences individuelles de personnes qui ont contribué entre 1996 et 2004 au succès de SCOPES. A cet effet, nous avons attaché de l'importance à une présentation aussi représentative que possible en incluant tous les pays ainsi que les principaux domaines et problématiques scientifiques.

Reinhard Lässig

Les médias s'intéressent aux projets de recherche avec les pays de l'Est. Image de gauche : Roman Berger, ancien correspondant en Russie du Tages-Anzeiger. Image de droite : Gregor Sonderegger, correspondant en Russie de la SF-DRS avec le caméraman Laurent Stoop.

En bas : Il faut parfois couvrir de grandes distances pour rencontrer son partenaire ou effectuer des analyses, et tous les moyens de locomotion y passent : en avion ou en train, en voiture ou en bus, et finalement à pied !

"I view our research collaboration as an investment in the younger generation". Heinz Müller-Schärer

East-west research benefits both sides

International collaboration enables many researchers to advance scientifically. However, when the Iron Curtain fell in 1990 and the first east-west research collaborations were just starting up, many scientists in the West were not sure that it would benefit both sides. Nearly 15 years later, most of those who took the big step towards a different approach to science can look back on many successful years of research.

Some of the countries in Eastern Europe have a long scientific tradition. The Russian Academy of Sciences, founded as long ago as 1724, is a prime example. Even then there was a lively international exchange, as exemplified by the Swiss mathematicians Daniel Bernoulli and Leonard Euler who went to St. Petersburg, then one of Europe's scientific centres, to teach.

Socialism held sway for more than 70 years, a time during which it was almost impossible for the common intellectual heritage shared by Eastern and Western Europe to develop. Once the Soviet Union had broken up, however, scientists in Western Europe soon realised that reviving the exchange would be a fundamental element in the democratic, social and economic development of Eastern Europe. Switzerland decided very early on to promote scientific collaboration with Eastern Europe in order to maintain major fields of research of these countries. The following examples of projects show that reciprocal expectations were met and that collaboration brings benefits for both sides.

New publications lead to new projects

"Theoretical physicists need no more than a pencil and paper," says Hans Beck from the Physics Department at the University of Neuchâtel. Beck and partners from Kiev (Ukraine) and Yerevan (Armenia) are working on basic physical research investigating aspects and mechanisms of the superconducting properties of copper compounds. Current findings are discussed at joint meetings. "Talking together provides input from others, and new ideas develop," says Beck's partner Valery Gusynin from Kiev (see also p. 15). Meetings of this kind and international conferences are very important for the Ukrainian and Armenian scientists. They give them a chance to report on their results and to get information on latest research.

Beck has also made progress in certain areas of solid state theory as a result of this collaboration. Impressive evidence for all concerned is the number of publications that have appeared. "We have published 15 articles jointly with our partners in Kiev," Beck says, "and two with colleagues in Yerevan". The physicists in Kiev are reaping the rewards of such active publishing: it made them more visible in the scientific community.

Reinhard Lässig

In close-to-nature forests in Siberia and the Urals the undisturbed recovery after windthrow and fire is being investigated on large areas.

University of Fribourg

Collecting plant samples of Veratrum album in the Kaukasus.

Discovering new materials together

Physics is also the focal point of an east-west project with institutes in Yekaterinburg, a million-strong city on the edge of the Urals, and in Tashkent, the capital of Uzbekistan. Albert Furrer from the Paul Scherrer Institute (PSI) in Villigen is working with scientists there to investigate magnetic properties in crystalline metals under pressure. This creates new materials which can be used, for example, as insulators in power stations or in innovative cooling systems.

These technical mono-crystals are being produced at the Ural State University in Yekaterinburg. "We have not had crystals of this kind at PSI until now," says Furrer. "In this way we are the ideal partners for each other and together can achieve more than each team separately". A major part of this collaboration were physical experiments carried out by students from Eastern Europe as part of their undergraduate studies at PSI. Their experiments were analysed in their home countries and the results were discussed at a concluding workshop in Tashkent.

Furrer is enthusiastic about this collaboration: "We were able to work in more detail with totally new systems with metamagnetic properties". He was also impressed by the students' enthusiasm for research. "For me this is the best thing to come out of the project," he says. "I can tell that my time has been well spent".

Fruitful forest and climate research

A few streets away from the physicists in Yekaterinburg, Stanislav Mochalov is working at the Ural State Forest Engineering University. Together with colleagues from the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) in Birmensdorf, the biologist is studying how species-rich forests in the Urals regenerate after having suffered storm damage. Mochalov is satisfied with the results: "Nowadays we recommend that foresters put more emphasis on natural regeneration after a storm instead of replanting large areas. It's cheaper and makes better ecological sense".

For the scientists at WSL, access to large forests in an almost natural state is very important. "If you understand how a primeval forest functions, you can use this knowledge in sustainably managed forests," explains Christian Hoffmann. "Through our colleagues at various institutes in Russia and the Ukraine we gained access to invaluable data on forests, climate and biomass. That would never have been possible without them," he says delightedly. Nowadays Russian forest scientists are involved in transnational networks. They have published their findings in scientific journals, specialist magazines and the daily press. The enormous public interest in their work have helped them on the way to new projects with international partners and funding.

Georgia's plant diversity in danger

Heinz Müller-Schärer from the Department of Biology, University of Fribourg, also finds wide expanses of mountain landscape such as the Georgian part of the Caucasus very attractive. "International opinion reckons that Georgia has the greatest plant diversity in Europe," he says. He fears, however, that this diversity is at risk because the intensive cattle farming of the communist era has been abandoned. "Former pastures have been neglected, allowing weeds such as the white hellebore to reproduce massively," Müller-Schärer explains. Together with partners from Georgia, he is studying how this plant, a tall, vigorously growing lily which cattle avoid, can be beaten back in order to prevent erosion and how the species diversity on the pastures changes in the process.

During their work, the scientists came across two pathogens that inhibit the growth of the white hellebore: "We cultivated them in a nutrient medium and applied them to host plants at various altitudes in Georgia," Müller-Schärer explains. The scientific tests, which were preceded by DNA analysis, suggest that these pathogens can be used to eliminate the white hellebore efficiently. This should make cattle farming economically viable again, thus providing Georgia's mountain-people with a way of staying in their home region. As a side benefit, species diversity on the pastures would increase again, an important step from research to practical application which could be used in mountain farming in Switzerland too.

New maps for Kyrgyzstan

Another mountain range is the scene of some collaborative geological research. The Tien-Shan mountains are the second highest range in the world, and Jean-Pierre Burg from the Federal Institute of Technology Zurich (ETHZ) has been studying this seismically very unstable region for many years. He was asked by his research partners in Kyrgyzstan whether he could help them to collect valuable geological data in the form of digital maps. "The first step was to store the information in a way that would

Christian Meyer

Christian Meyer

Left: Bones of Sauropod dinosaurs from the Bale Museum (Croatia).

Right: Footprints of dinosaurs on the Croatian coast.

prevent even more from getting lost," Burg says. The scientists hope that this work will also help to restrict the unregulated and unauthorised settlement activity that is currently taking place around the capital Bishkek. "The challenge to me was the great practical relevance of this work," Burg says. The set of 1:200 000-scale maps is now available to engineers and scientists all over the world on the Internet and has great practical potential for the research partners. For example, the maps could help to quantify more accurately the impact of a planned reservoir, or to produce sustainable spatial planning for the capital Bishkek. Burg himself has enlarged his knowledge of the geology of the Tien Shan mountains enormously through this work.

Dinosaurs leave traces in water and on land

Christian Meyer from the Natural History Museum in Basel also charted unknown geological terrain. He and his research partners from the Department of Geology and Palaeontology at the University of Zagreb discovered a large number of traces of dinosaurs in Croatia. "This is the first evidence that dinosaurs lived in this region in the Jurassic period," Meyer says. He and his partners also came to the surprising conclusion that sauropods (meaning "Lizard-Footed") lived in large herds in this region. The scientists discovered traces of the dinosaurs under water, too. "The geological interpretation of this region has changed slightly as a result of our findings," Meyer explains, "because if we find traces under water, this means that the area was formerly a swamp and can't have been a body of water; accordingly, the coastline in this region must have been different to what we had previously assumed". The findings in Croatia constitute additional pieces in the jigsaw puzzle of the dinosaur map of the world. One of these pieces is a quarry containing many dinosaur traces which has now been designated a protected area – a lasting benefit of this collaboration.

"I feel that SCOPES is a kind of basic funding that helps to secure other sources of money". Jean-Pierre Burg

This collaboration brought the specialists in Croatia out of their isolation. "Today they are part of the international research community, participate in conferences, can get to know colleagues in the field and think in a more integrated fashion than before," Meyer says of his research partners with pleasure.

On the trail of proteins

The traces that Nenad Ban from the Institute for Molecular Biology and Biophysics at the ETHZ is following are far smaller than those of Meyer. Ban and his research partner from the Institute of Chemistry at the University of Zagreb are focusing on individual enzymes that regulate protein synthesis in cells. "This is basic research in its purest form," Ban says. "In the longer term, our work with these proteins is likely to be of interest to the pharmaceutical industry because the results can help in developing new antibiotics," the structural molecular biologist explains.

Although structural biological research is very expensive and time-consuming, both research teams have made progress. "We identified crystals of various enzymes, and the next step will be to analyse their structures," Ban explains. The joint project fits in well with other work being carried out at Ban's institute. This is also the reason why the scientists were awarded a Unesco Loreal Fellowship for a doctoral student from Croatia, who is now working at the ETHZ. This collaboration is more or less a continuation of the scientific training which Ban completed in Zagreb in 1994. Like him, many Croatians are currently working abroad and are contributing to the reconstruction of their country in the process. Because of the national importance of this work, the Croatian newspapers have reported on Ban's lectures and on an international conference in Zagreb.

The scientific standard is rising

In general, the level at which science is carried out in the countries of Eastern Europe is fairly high. However, scientists who need complex methods, techniques and infrastructure for their work tend to fall behind rapidly because they cannot afford modern apparatus and equipment. If the technical infrastructure can be improved through international funding, this often immediately improves a country's scientific performance. Apart from outside support, the main factor determining this improvement was the extraordinary dedication of the scientists in Eastern Europe, and this in turn has had a positive impact on the reputation of many research institutions.

In many of the projects, the benefits for the Swiss side lie in the unique technical developments, methods and experiences of their eastern colleagues and the natural and cultural resources. In the long run, it is important that scientists in Eastern Europe regain responsibility for the treasures in their regions because, as Christian Meyer from the Natural History Museum in Basel says, "that will create value and self-confidence in those regions".

Valery Gusynin, Theoretical Physicist,
Bogolubov Institute for Theoretical Physics,
National Academy of Science, Kiev, Ukraine

Alexandra Stark

Alexandra Stark

Yurii Sitenko (left), Valery Gusynin (right) and their Swiss partners have managed to publish 33 national and international publications under the SCOPES project.

Eastern point of view

"Isolation means the end for a theoretical physicist"

The bus turns onto a car park and brakes sharply. "Institute for Theoretical Physics. The bus terminates here. Everybody off!" orders the driver. The journey from the metro terminus to the outskirts of the Ukrainian capital Kiev has taken half an hour. The streets got narrower and narrower, the potholes deeper and deeper. Towards the end, there were not even many houses, and then goats started appearing on the road.

Some research institutes are at the centre of things and need constant change for inspiration. "We're more the kind of people who think up good ideas because it's so quiet here and the atmosphere is so peaceful," says Valery Gusynin with a grin, and leads the way to a building hidden behind some trees. Gusynin is Professor and Leading Scientist at the Bogolubov Institute for Theoretical Physics in Kiev.

There were times in which the silence looked like becoming a threat to the institute. Ukraine, one of the states that emerged after the collapse of the Soviet Union, had few resources that it could dedicate to science. At one point the institute was not even able to pay its electricity bills. "About 20 of 100 colleagues left because of the minimal pay. They could no longer afford to be scientists," says Yurii Sitenko, Head of the institute's Department of Theory of Nuclei and Quantum Field Theory. Subscriptions to international publications and journals were cancelled as well. Computers were unaffordable, and e-mail and Internet access were rare commodities. It was not a peaceful silence, but the silence of the grave because, as Sitenko says, "Isolation means the end for a theoretical physicist".

International collaboration, including three SCOPES projects, helped the scientists to improve their situation and that of the institute. The projects helped in two ways, Gusynin recounts: "Firstly, we became better known internationally. Today it is easier to publish our work. And because our institute publishes a lot of work, it has become easier to acquire international funding. Secondly, while I am working abroad I can save money to see me through the times when no grants are available".

The aim of the projects was to link the scientists with other countries and to improve their access to information and the Internet. Computers were purchased; books were bought for the library. Today everyone has Internet access, although there are still no online subscriptions to journals because they are too expensive. "We manage by concentrating on papers that researchers post independently on the Internet," Sitenko says. "Obviously this is far from ideal because these papers are often only provisional versions. In our field of research, access to information is becoming increasingly vital. If we're not up to date, we will lose touch with the scientific community".

In addition to poor access to publications, the scientists in Kiev are also lacking another important source of inspiration: "An intensive personal exchange with colleagues in our field is a vital requirement for good research. That applies to everyone, to Swiss and Ukrainians alike". This is why Gusynin and Sitenko would like more meetings to take place in Ukraine. "Then we could invite other Ukrainian scientists, and our younger colleagues would benefit greatly from these contacts. In these economically difficult times, it is important that young, talented scientists don't jump ship. That would be a pity for them, for the institute and for the field," Gusynin says.

The institute is likely to be dependent on international research funding for a long time yet. "We keep on hearing that the Ukrainian economy is growing and that our situation is improving. Unfortunately we scientists haven't noticed much of this improvement. We're still waiting …," says Gusynin, laughing. (AS)

"I now have a far greater understanding of the situation in the countries that made up the former Yugoslavia". Ursula Heiniger

For Nikolay Berlinsky and his staff at the Institute of the Southern Seas in Odessa the well equipped laboratory is in the centre of their research.

Reinforcing and networking research competencies

The primary objective of the research collaboration between Switzerland and countries in Eastern Europe is to retain and reinforce scientific work in those countries and to help modernise it. To this end, Switzerland is promoting research and training projects with scientists, institutions and networks. A review of the collaboration to date shows that the scientific skills of many Eastern European teams and institutes have improved and that many researchers in the East are equal partners for their western colleagues.

Until 1990, many universities in Eastern Europe mainly taught, and very little research was carried out. The institutions at the scientific academies, in contrast, concentrated almost solely on basic research. This division should now be a thing of the past, because nowadays research is an important activity at the universities as well. However, state funding for science continues to be very limited and basically covers only the wages. As a result, in many places growing emphasis is being placed on contract research designed to solve specific problems.

How do research institutions in Eastern Europe benefit from collaboration with international teams? They become familiar with western infrastructure and the methods used in the West (see report on p. 19). This helps them to catch up with international standards in their field of research. Their staff are invited to international conferences, become involved in global networks, and publish increasingly in renowned journals. As the following examples of projects show, many institutes and researchers have overcome their scientific isolation thanks to east-west collaboration.

Important workstations for chemical research

Thomas Bally from the Department of Chemistry, University of Fribourg, believes that it is vital for the success of a collaborative project for everyone involved to be able to think, work and communicate with each other freely and openly. His research partners from three chemistry and physics institutes at the Russian Academy of Sciences in Novosibirsk share his view.

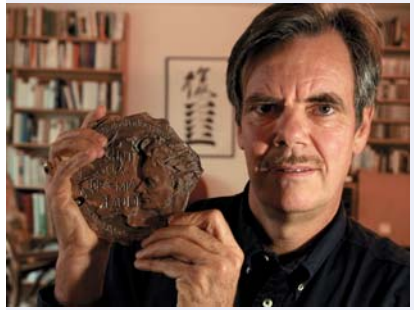
The partners planned to use the project to develop new substrates for an application called photoaffinity labelling. This technique enables the structural properties of proteins and the way they change to be investigated using photophysical methods. The work produced some unexpected findings: "During our investigations we discovered a new class of molecules that had not been described before," Bally reports. This collaboration also showed him that basic research does not always have to be deadly serious. "Science is fun," Bally says. "I feel it is important to take a hands-on approach to science in order to give intellectual creativity room to develop".

One of the things that Bally's Russian partners learned in Fribourg was how to install complex quantum chemistry software on a Linux workstation. They subsequently managed to establish a cluster of seven computers of this type in Novosibirsk – a quantum leap for the IT infrastructure at their workplace. In return, the scientists from Novosibirsk showed their colleagues in Fribourg how to use time-resolved spectroscopy.

"The situation in Novosibirsk is considerably better now than it was five years ago," Bally says. "One of our project partners is in regular contact with us and

Alexandra Stark

“The ‘brain drain’ is still a big threat in Russia; we have to play our part in helping Russia to hold on to its scientific expertise”. Thomas Bally



Aldo Ellena

In September 2004, Thomas Bally from the University of Fribourg was awarded the Marie Sklodowska-Curie medal for outstanding work in radiation chemistry in Warsaw. Bally says: "Without the collaboration with my partners in Poland during my first SCOPES project in 1997 and 1998 I would never have received this honour".

Ursula Heiniger

Chestnut blight causes mortality of single branches and eventually whole trees.

with American colleagues in Ohio, and is also evaluating project proposals from Russia as part of an EU mandate". His research partners are also well networked within Russia.

Equipping labs and the library

Forest pathologist Ursula Heiniger from the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) in Birmensdorf found quite different conditions in Bosnia-Herzegovina. The war there had caused enormous damage, much scientific data had been destroyed, and the Forestry Faculty library had gone up in flames. As a member of the informal European Chestnut Network, Heiniger studies natural biological control of a fungal disease that can kill off entire sweet chestnut forests. Working with partners from Bosnia-Herzegovina, Hungary and Macedonia, she investigated the spread of this disease, its intensity, the diversity of the fungal population and the occurrence of a hypovirus that can keep the fungus under control. "Chestnut blight is very common in Macedonia, and we discovered that the fungus has a low genetic diversity and that the virus is rare," Heiniger comments. "In Bosnia-Herzegovina, on the other hand, the fungal diversity is great and the hypovirus occurs in most of the forests".

"If we can get the chestnut disease under control, then there is a chance of producing and using high quality timber," she says. There are many uses for both the valuable hard wood and high quality fruits, and they can generate a regular income. This is why local scientists want to work with the forestry services to deploy the hypovirus for biological control.

Neither Bosnia-Herzegovina nor Macedonia had the technology to investigate the interactions between fungus and hypovirus. So the scientists used the project funding to provide basic equipment for laboratory tests and a large amount of specialist literature in much the same way as Heiniger had done a few years previously in Hungary.

Training for better environmental quality

In the coming decades, water is said to become an increasingly vital natural resource. Numerous projects involving scientists from east and west are focusing on this medium. Researchers from the Swiss Federal Institute for Environmental Science and Technology (EAWAG) in Dübendorf (see also p. 20 and 33), the University of Zurich (see p. 20) and the University of Neuchâtel (see p. 21) are collaborating with partners in Albania, Kazakhstan, Russia, Ukraine and Uzbekistan to investigate the water quality of various surface and subterranean water bodies.

Janusz Dominik and Walter Wildi from the F.A. Forel Institute at the University of Geneva have been collaborating since 1996 with scientists in Bulgaria, Poland (until 1998), Romania and Ukraine. They are taking an approach that combines research and training. "We have a lot of ecological problems, the impact of which we cannot identify because we don’t have any measuring instruments," says Tamerlan Safranov from the Odessa State Environmental University, one of the partners working with scientists from Geneva. The project succeeded in greatly improving the level of equipment at certain institutes. The scientists detected very high levels of heavy metals in several rivers, although pollution in the Danube delta was found to be less serious than had been feared. Some aspects were dealt with in greater depth by upcoming young scientists from Eastern Europe in dissertations supervised by Dominik and Wildi.

"Environmental science is a relatively new field in these countries," says Dominik, who helped to update the curricula at several universities in Romania and Ukraine. Nikolay Berlinsky from the Institute of the Southern Seas, also in Odessa, was amazed not only by his Genevan partners’ knowledge. "I was also very impressed by their methods, the way teaching is organised and the way knowledge is transferred," he says. "The

University of Geneva

Participants of the summer school on coastal sea problems at Odessa.

"I was thinking a lot about how to bring partners together and how to organise them. The project was an organisational challenge!"

André Musy

professors view students not just as beginners but also as future colleagues and partners". Dominik recalls: "For the students – and for some of the professors as well – the summer school we organised was something completely new, practically a culture shock; in the past students there were rarely asked their opinions and were not able to contribute to discussions". Dominik and Wildi's biggest success may be yet to come. As more students are able to benefit from the new course material, the results of collaboration to date will have an ever more sustainable impact on the environment.

Diversified education in hydrology on the Web

The importance of water for society is also highlighted by a wide-ranging training project carried out by a number of universities and research institutes in Bulgaria, Moldova, Romania and Ukraine in conjunction with the Institute of Soil and Water Resources Management of the Swiss Federal Institute of Technology Lausanne (EPFL). André Musy from the EPFL and his research partners developed the "VIrtual CAmpus In hydrology and water REsources" (http://hydram.epfl.ch/VICAIRE/). The new course incorporates case studies from the Balkan regions. "Teaching capacities will increase dramatically thanks to the web-based course," says Musy, who has also been working with Romanian partners since 1992. Word will soon get around that the course is available on the Internet, and the response is likely to be good. "There is political and societal awareness of these problems," says the Lausanne-based hydrologist.

Musy's collaboration with research partners from seven institutions in four countries is a prime example of an Institutional Partnership Project. This collaboration has enabled many researchers to improve their level of scientific qualification. The project also has an outreach component, since the information on hydrology is available at any location on the Internet and can be put into practice. And finally, the project enables the Eastern European partners to achieve a greater degree of networking among themselves. "Collaboration between the Eastern European countries in VICAIRE increased as the project progressed," Musy says. His thoughts have already moved on to the next stage: "The VICAIRE web course has been given to the UNESCO chair in Greece (www.inweb.gr) which will offer it to universities in all the Balkan countries".

Collaboration with far-reaching effects

E-mail and the Internet became an established part of life at around the same time that the Iron Curtain opened. Many research networks benefited from the new ways of communicating and sharing information, and partners in the countries of Eastern Europe and central Asia joined in gradually. "When my research partners are attending international conferences and keep maintaining their contacts," says Thomas Bally from the University of Fribourg, "they are also improving their scientific perspectives at the same time". Ursula Heiniger from WSL has also seen her research partners benefit consistently from networking. In addition, a growing number of scientists from Eastern Europe are taking the initiative and accepting responsibility for the areas in which they are working.

The collaboration between east and west in recent years has increased the research capacity of the eastern countries. Funding for foreign travel and for scientific infrastructure and consumables has also helped. Some countries and some disciplines have problems with human resources. The "brain drain" is still a threat because many scientists are undervalued in their own countries or simply have no perspectives there and are forced to seek better-paid employment either in their own country or abroad. Promotions within research institutions in Eastern Europe, on the other hand, are a sign that scientists are receiving more recognition and that their status is improving.

The ravages of war have created a special problem in some countries. "In Bosnia-Herzegovina there are no mid-level forest pathologists as a result of the war," Ursula Heiniger notes. A whole generation of young and ambitious scientists will first have to develop, and it could take decades before the problems caused by the political and social changes of the past 15 years will stop making science difficult in these countries. Nonetheless, Janusz Dominik from the University of Geneva is confident that the countries in Eastern Europe will integrate quickly into the international scientific community. "Collaboration and agreements have shown me that we are moving towards a unified Europe in which the East will have almost equal opportunities in terms of research and training".

Iryna Derkatch, Paediatric Nephrologist,
Lviv City Children's Hospital, Ukraine


Alexandra Stark


Alexandra Stark

Left: Iryna Derkatch and Ernst Leumann during the 2004 paediatric training at Lviv City Children's Hospital.

Right: Using the new ultrasound probe.

Eastern point of view

Collaboration has improved qualifications and work

"Children! Out of the way! We've got a visitor!" Iryna Derkatch calls. Two boys who have been playing ball in the wide corridor stop to see what's going on and to let Derkatch, a paediatrician specialised in kidney disorders who works at the Lviv City Children's Hospital in Western Ukraine, and Ernst Leumann, a retired professor from the University Children's Hospital Zurich, go by. Mothers with their children in their arms stand in the open doorways of the ward. The sun is shining, the ward is filled with light, and the atmosphere is friendly.

That was not always the case, Iryna Derkatch remembers: "The paediatric nephrology ward employs three doctors, a nurse and a cleaner for 30 patients. We earn next to nothing. We're short of money for practically everything. In the winter, the children have to bring warm clothes with them, otherwise they'd freeze …" But the era in which they thought nothing would ever change is over.

Their resignation has given way to the conviction that the team has achieved a great deal. "Although our financial situation has hardly changed at all, we have been able to improve the quality of our work because Professor Leumann has shown us how to make the most of what we have. Additional training courses held as part of the project have increased our knowledge," Iryna Derkatch says. Her boss Martha Secunda is extremely satisfied: "The project has improved both our level of qualification and our work".

Dozens of hospitals in Ukraine are experiencing the same phenomenon: during the Soviet era difficult cases were transferred to Moscow; since the country became independent they have been coming to Kiev. The heavily centralised and hierarchical structure is still a fundamental problem. There is practically no money left for regional hospitals. "Before the project we had no computers, no Internet access and no information". Even today, she is still unable to travel to Kiev for further training; she would have to pay for the trip herself, and that would cost a month's salary.

"So with Professor Leumann's help and money from SCOPES we organised our own courses; international experts have come and taught us here," Derkatch says proudly. Invitations were extended to colleagues from all parts of Ukraine who are in exactly the same situation as Derkatch. Money was provided to cover some of the travelling expenses. "We had colleagues from 22 regions in Ukraine at the last course. The feedback was very positive. We found that we were able to help ourselves, and that was incredibly motivating! We no longer feel so dependent on Kiev".

Another result of the project is that the hospital will soon be able to carry out biopsies. Funding was provided for the necessary material, books and an ultrasound probe. And the pathologists who examine the tissue once the samples have been taken were given a compound microscope from Zurich.

Ernst Leumann is happy. He knows that "people approach medical problems differently in the East. The doctors are used to prescribing a number of different drugs at the same time as they did in the Soviet era, without considering the wisdom of what they are doing". When challenged, they all give the same reply: "You've got enough equipment in the West to do it differently". He decided to involve his colleague from Yerevan in his last visit, to lend greater credibility to his efforts to change the way they think. "This doctor also once told me that she couldn't do what I suggested. But now she is convinced that it was necessary and right to make the change".

The children have the corridor under their control again. Iryna Derkatch looks at them: "I am very satisfied with the outcome," she says. "But there is still a lot to do. We need better infrastructure and above all more training. That would improve the quality of our work and our quality of life – more than a small increase in pay. Because as we say in Ukraine, being a doctor is not a job, it's a way of life …" (AS)

"We should never forget that just 50 years ago untreated waste water flowed into Switzerland's lakes and rivers too". Reinhard Bachofen

Diverse nature – threatened environment

The land mass between the Adriatic and the Pacific includes large areas of untouched countryside. However, these natural riches are under threat: in many places air, water and soil are heavily polluted. People and the environment are at risk. Will political collapse be followed by environmental collapse? Scientists from Eastern and Western Europe have been trying to assess natural values and environmental risks.

Russian Academy of Sciences Moscow

Reinhard Bachofen

The fall of the Iron Curtain opened up two simultaneous opportunities for Swiss researchers. They met competent research partners who appeared to be deserving support, and they gained access to research objects for which there was nothing comparable in the West: clean lakes and rivers, species-rich ecosystems and untouched primeval forest on the one hand, and severe air pollution, contaminated soil and salinated lakes on the other. The following examples demonstrate how researchers from Switzerland and the countries of Eastern Europe are tackling these challenges together.

Intact and polluted environment side by side

Alexander Zehnder, president of the Swiss Federal Institutes of Technology Board, is fascinated by the extensive tracts of sometimes pristine countryside in Eastern Europe. Yet, not far away, there may be areas of catastrophic pollution, "beyond good and evil," as he puts it. As former Director of the Federal Institute for Environmental Science and Technology (EAWAG) in Dübendorf, Zehnder worked with microbiologists in Moscow. During this collaboration he learned how great the differences in environmental quality in the countries of Eastern Europe could be. "You can hardly imagine how bad water pollution in military zones, for instance, can be," he says, "whereas today the waste water situation in many large Russian cities is not bad at all". As part of the project, the research partners succeeded in improving student training and molecular biological technology in Moscow. Thanks to new hardware, reagents and other aids, scientists there are today able to conduct demanding microbiological analyses under oxygen-free conditions.

Reinhard Bachofen of the Institute of Plant Biology at the University of Zurich and his partners from the University of Tirana have had extremely contrary experiences concerning environmental standards in Albania. "The quality of the rivers and lakes in the mountains is very different from that in the lowlands," says Bachofen. On the one hand you have many clean mountain lakes and rivers, and on the other bodies of water in urban areas that are massively polluted with organic substances. "Our measurements showed that owing to suspended matter, the sediment in estuaries contained greater quantities of heavy metals than that in other coastal areas," the biologist comments. At present, urban development in the lowlands along the Adriatic is virtually unregulated. "In 1988, the population of Tirana, the capital, was just 200 000; by 2004, it was already more than 700 000. The construction of at least one mechanical water treatment plant keeps settling sediments and solids, if nothing else, out of the rivers," Bachofen emphasises. Besides this, there is the unsolved garbage problem. Comprehensive collection systems, controlled landfill sites and waste incineration plants simply do not exist.

Reinhard Bachofen

ETH Zurich

Left: Students from Russia and Switzerland during a workshop where they studied the environmental situation of the White Sea.

Centre: Albania's mountain rivers mainly provide clear and fresh water.

In the lowlands of Albania some of the rivers are heavily polluted.

Right: Rainer Schulin (centre) discussing the soil quality with his Bulgarian partners.

"There is no objective reason why Bulgaria, with its enormous natural resources, should be in a bad state". Rainer Schulin

Ground water flows control Aral Sea

Francois Zwahlen of the Centre of Hydrogeology at the University of Neuchâtel and his partners from Kazakhstan, Russia and Uzbekistan are researching underground flows of water in the region around the Aral Sea. They are trying to establish the quantity, sources and quality of the water that flows into the Sea. The region offers a unique research situation: because there are no longer any surface inflows, the inflow of ground water can be determined accurately. Yet, Zwahlen remarks: "It is very difficult to stop the Aral Sea from drying up any further". For emphasis he adds: "Nothing is likely to change until decisive economic and political steps are taken". The expertise for the measures needed to save the Sea is existing. "We have shown that an amount of water equal to almost 60 percent of the water that the Sea receives through precipitation flows into the Sea underground," says Zwahlen's partner Evgeny Kontar of the Shirshov Institute of Oceanology in Moscow (see Interview, p. 23). According to Zwahlen, it is very important for his partners from the East that western scientists take an interest in and support their research. "That motivates many of them to remain in science and preserves their enormous know-how in the field of hydrology," he remarks.

Hazardous substances pollute soil

In many areas of Eastern Europe the soil is contaminated with heavy metals. Most of these harmful substances are produced by industry. Through precipitation they enter the soil, and as a result may reduce the output of agricultural and forest products.

Rainer Schulin of the Institute of Terrestrial Ecology of the Federal Institute of Technology Zurich (ETHZ) led a project in which he worked with three Bulgarian teams on the risk evaluation of soil samples taken in the vicinity of a large steelworks. In summer, soil particles in the form of dust are carried by wind as far as Sofia. "Our hypothesis was that emissions from the steelworks contaminated the soil. But only in the case of lead did the distribution pattern of the heavy metals provide at least partial confirmation of this assumption," says Schulin. For the greater part, the increased concentrations of the heavy metals could be ascribed to the geological origins of the valley bottom in which Sofia lies.

In Bulgaria there is considerable residual industrial pollution. Besides this, vehicles, households and industrial plants emit large quantities of hazardous substances. This is particularly problematic in the vicinity of agglomerations such as Sofia, where intensive use is made of the soil. Schulin and his Bulgarian partners are convinced that in the future soil quality will play an important role in agriculture in particular. "We must sensitise Bulgarians to what can happen to the environment if they do not take proper care of it," he says, "so that this country does not have to go through the same painful processes as some western countries".

Protecting Romania's biodiversity

Numerous animal and plant species that have become rare in Western Europe still find a suitable habitat in sparsely populated regions of Eastern Europe. As a result, biodiversity research specialists often strike lucky in the open expanses of the East. In the early 1990s, Bruno Baur of the Institute of Environmental Sciences, University of Basel, became acquainted with Romania's enormous natural potential: "I saw many plant species occuring only in this European region for the first time there". It was also on a research trip that he met his later project partners from the University of Cluj-Napoca, with whom he has subsequently identified numerous rare species. As in other Eastern European countries, the Romanian scientists' systematic recording of their flora and fauna is of a high standard.

Thanks to the joint project and the help of the Romanian "Environmental Partnership Foundation", Baur's research partners were able to acquire a 20-hectare conservation area, in which they have since been able to identify 739 species of butterfly. One of these was a new discovery for scientists, and another had not previously been found in Europe. "The first joint publication on this attractive biodiversity project was immediately accepted by a reputable journal – with my Romanian doctoral student listed as lead author," remarks Baur with pleasure.

Gerald Kerth

Christoph Scheidegger

Left: Bechstein's bat, an endangered species in Switzerland, still lives in untouched Bulgarian forests.

Right: Lung lichen has its greatest genetic diversity in the Urals primeval forests.

Primeval forest as a refuge for bats

"The strengths of Bulgarian bat specialists are field research and their knowledge of species," says Gerald Kerth of the Institute of Zoology, University of Zurich, whose experience with local partners has been similar to that of Baur in Romania. Together with Barbara König, the institute head, and a biologist from the National Museum of Natural History in Sofia, Kerth is studying the behaviour and genetic diversity of the Bechstein bat. He knows of only two colonies of this animal species in Switzerland, although – as discoveries of bones in old caves testify – before the last Ice Age it must have been the most common type of bat there.

Kerth and his Bulgarian partner discovered three new colonies of Bechstein bats in Bulgaria. The DNA analyses that they carried out on 120 tissue probes taken from the skin of the wing reveal great genetic diversity. "In Central Europe we have been able to study this rare species of bat practically only in managed forests. If we want to learn more about what they require in terms of ideal habitats we have to go to deciduous forests that are still fairly unspoilt, for example in the Balkans," Kerth remarks. These joint investigations give an insight into the very distant past: the greater the number of genetic analyses of Bechstein bat populations from different regions, the clearer the picture becomes of how this bat resettled Central Europe after the Ice Age. Knowledge of its requirements helps to better protect the habitat of the small mammal.

Greatest diversity of the lung lichen in the Urals

Christoph Scheidegger of the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) in Birmensdorf and his Russian research partners are also interested in unspoilt forests. In the northern conifer and mixed forests they seek incidences of lung lichens *(Lobaria pulmonaria)* with a view to using DNA analysis to determine the genetic diversity of this species – from Central Europe, through the Carpathians and Urals, to the Pacific coast. Contrary to their hypothesis, the scientists established that the genetic diversity of this lichen species was greatest not in the Russian East, but in the Urals. "It appears that the populations slopped across the Urals from both sides, from the West and from the East," Scheidegger explains.

> **"The motivation of the Bulgarians impressed me; it is something I frequently miss in Switzerland".**
>
> Barbara König

Travelling between the Urals and Sachalin, Scheidegger also learnt a lot about the historical background of these regions: "In Sachalin I really became conscious of the island's dramatic history – as a penal settlement, as described by Anton Chekhov, and as a cultural space caught in the conflict between Japan and Russia". He mentions that research is facing a difficult situation in this peripheral region at present. A trip to Western Russia at short notice is too expensive for his Russian research partner. The next project he and his colleagues want to tackle is the development of a modern strategy for protecting lichen species in primeval forests.

Collaboration enhances reputation

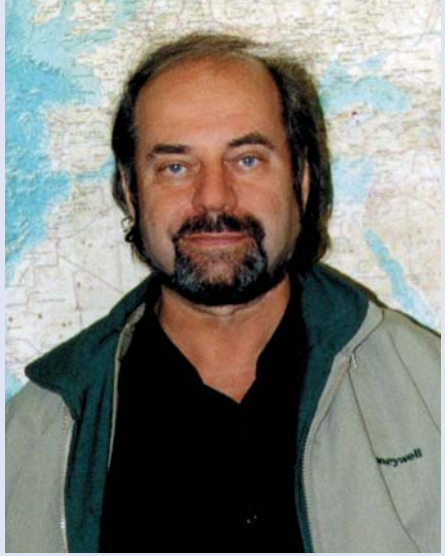
Most of the Swiss researchers active in east-west co-operation projects are fascinated by the pristine quality of the countryside between Tirana and Sachalin. François Zwahlen of the University of Neuchâtel is "impressed by the strength and belief in the future" of his research partners in Central Asia, despite their difficult living conditions. And Alexander Zehnder of the ETH Board closely felt "the scientists' love and devotion to their work". Besides the purely scientific aspect, he observed how his partners "made more out of less and were more open to dealing with change". In Russia he saw that people who were not so firmly embedded in the scientific system were very innovative and creative. He wishes something similar for Switzerland as a research location.

Reinhard Bachofen of the University of Zurich is very taken with Albania and attracted by the nature and the inhabitants there. He cherishes great hopes for this Balkan state, isolated for so long: "When I see that today a former project partner is a deputy minister in the Albanian department of the environment, I realise that things really are beginning to move in this country". This example is not an isolated case. SCOPES partners are also active in political advisory committees in Armenia, Georgia, Kyrgyzstan and Russia. This demonstrates how scientific specialists in the countries of Eastern Europe can improve their reputation by collaborating with partners from Switzerland. However, regarding changes at a broader level, Zehnder expects that Eastern Europe's path to truly democratic societies will be very rocky. Despite this, many research partners will continue to champion the research of its diverse flora and fauna and worthwhile environment, not least because they are motivated and bolstered by the collaboration with their Swiss partners.

Evgeny A. Kontar, Oceanologist and Hydrogeologist,
Russian Academy of Natural Sciences, P. P. Shirshov
Institute of Oceanology, Moscow

Eastern point of view

“Water that disappears from leaking canals is not lost”



Alexandra Stark

François Zwahlen

Evgeny A. Kontar from Moscow (left) and scientists from Kazakhstan, Uzbekistan and Switzerland investigating the ground water level of the Aral Sea (right).

Professor Kontar, your field is the ecological situation of the Aral Sea in the border region between Uzbekistan and Kazakhstan. How would you describe the current situation there?

The Aral Sea is a type of natural laboratory that shows what happens when people fail to manage water carefully. Since the 1960s, an increasing amount of water has been diverted from the rivers that arise in the mountains of Afghanistan and flow through Central Asia and into the Aral Sea. The water was used to irrigate rapidly expanding cotton fields. The irrigation systems are so bad that incredible quantities of water seep away. The consequence is that one of the two inlets has dried up and the other is in the process of disappearing. The water level of the Aral Sea has already fallen by 34 metres.

With serious consequences for the environment and the population?

Most certainly! The salinity of the Aral Sea has risen strongly and is now about as high as that of the Dead Sea. Besides this, the Aral Sea also contains large quantities of pesticides and other hazardous substances. The former seabed that has become part of the shore dried out. This dry mud has turned to dust mixed with pesticides. Because the people in the area breathe the air and drink the water, they are exposed to extremely high levels of pollution.

How can this project help to improve the situation?

Until recently, it was assumed that inflowing ground water could not really help to improve the situation. Hence, the discussion of the Aral-Sea problem focused on surface inflows of water and the question of who may draw off how much of it. However, we have shown that ground water can make a considerable contribution to stabilising the water level of the Aral Sea. The thinking behind this is that even the water that seeps out of leaky irrigation canals is not lost, but increases the quantity of ground water that flows into the Aral Sea. Thus, it is one of the factors that can help to establish a new balance. Once this balance has been established, life will be possible again. And then the newly created shore can be planted.

Which concrete steps have you taken?

Our partners, Professor François Zwahlen and Philippe Renard of the University of Neuchâtel, developed a mathematical model, which they tested with data gathered in Switzerland and other countries. Our collaboration offered an opportunity to test this model in Central Asia as well. For this purpose we used data that our partners in Uzbekistan collected over a long period. The model calculations also produce a plausible result for the Aral Sea.

According to your model calculations, when will a new balance be established?

Our model shows that for the larger, Uzbeki, part of the Sea this could well be the case by 2010. Incidentally, a small part of the Sea in Kazakhstan has been cordoned off by a dam. Although the water level there is much lower than previously, the Sea has already stabilised at this level.

In effect, this project is built around a mathematical model whose results have produced an immediate effect ...

Yes, it gives the people in the region hope and shows them how to deal with ground water. This is very important, because in the course of the project we have found new supplies of water at a great depth that can provide clean water for the population.

Can the model be applied to other cases?

This model has potential: it could also be used in other countries with similar problems, in other words, in places where people do not give any thought to their water consumption and hence upset the ecological balance. (AS)

"Through this collaboration I have gained a great deal of self confidence". Alexandra Nikolic

Sustainable regional development

Martin Boesch, University of St. Gallen, has received the honorary doctorate from Taurida National University in Simferopol in recognition of the modernisation of education and research in economic geography and regional planning politics.

PA

TNU Simferopol

The political, economic and social developments of the past 15 years have changed the spatial structures of extensive areas in the countries of Eastern Europe. This is raising new questions in many regions, e.g. about urban and regional development, mobility and land use. There is a demand for scientists with new competencies, and for the introduction of new training programmes or the overhaul of old ones.

Regional planning in the former Soviet Union or in Yugoslavia was primarily shaped by the geographic size and diversity of these countries. Changes in political and economic objectives as well as their smaller territorial size are forcing the successor states to modify their spatial structures. One way of dealing with this is through future-oriented regional development. Among other things, this will show how regions can improve cooperation and create new traffic and trade routes. The use of agricultural and forest land also needs to be reconsidered, as sustainable exploitation of natural resources can become a significant source of economic activity for many countries. The following examples present the joint conclusions of research partners from the East and the West.

Learning to plan regional development

"In the Soviet era, regional planning was done at the highest level," says Vladimir Bokov of the Taurida National University (TNU) in Simferopol, Ukraine (see Interview, p. 27). Today, however, the Crimean Peninsula, like many regions of the former Soviet Union, lacks concepts for comprehensive regional development planning involving different departments. "The main problem is probably the difficulty of changing the structures in the state property monopoly," says Martin Boesch of the Institute of Economic Geography and Regional Policy at the University of St. Gallen. On the Crimean Peninsular there were hardly any specialists in regional development. Therefore, the first step for the University of Simferopol was "to invest in training, so that young graduates could be prepared to take on the tasks of the future," Boesch added.

The goal of the project partners was to establish a post-graduate course in sustainable regional development. Bokov brought together a group of lecturers, they and their Swiss partners jointly drew up a curriculum, and in autumn 2003 the first training programme was launched, offering students the opportunity to improve their knowledge of landscape ecology, regional development and regional economics.

Boesch is working with additional research partners from Bulgaria, Croatia and Moldova to test how knowledge of regional development can be applied in practice. "We want to show how regions can attract eco-tourism," he remarks. Specialists from the Universities of Berne and St. Gallen, the Universities of Applied Science in Zurich and Rapperswil and the Entlebuch Biosphere Reserve are providing expertise for the project.

New maps and models for urban planning

"In Belarus it is simply very difficult to conduct complex studies of interdisciplinary urban and regional development, because many institutes are too specialised," says Galina Martsinkevich of the Department of Geoecology at the Belorussian State University in Minsk. As in most countries of the former Soviet Union, many institutions in Belarus, too, are sitting on huge quantities of data relevant for regional planning. "But before you can pool this information you have to overcome enormous bureaucratic and political barriers," the dedicated department head adds. Project co-ordinator Monique Ruzicka of the Laboratory of Territorial Dynamics at the Swiss Federal Institute of Technology Lausanne mentions one reason: "Data can be very powerful, they can undermine those who are in power and, therefore, a lot of

Transportation network in the surroundings of Bosnia-Herzegovina

Walter Schenkel/Michael Güller

mistrust is involved". Despite this, the Belarus team, supported by the Lausanne architect, managed to store a substantial amount of environmentally relevant data from the cities of Minsk and Mogilev in a geographical information system. This enabled the researchers to draw detailed maps of urban development and environmental pollution in Minsk and Mogilev for the first time and to exemplarily analyse urban land use. In consequence, a reservoir for clean drinking water in Mogilev and measures to remediate soil contaminated with heavy metals are no longer wishful thinking.

Sensible plan to network road traffic

"The transition from a planned to a free market economy destroyed the connections between the regions," says Yuri Samokhin of the Institute for the Study of Regional Economy in St. Petersburg. On the other hand, sustainable economic development needs intact structures and supraregional traffic corridors. In the view of Walter Schenkel of the Institute of Political Science, at the University of Zurich, who is working with partners from Bosnia-Herzegovina and St. Petersburg, these also have a political significance.

In conjunction with Michael Güller, a Zurich architect, Schenkel organised a conference in Sarajevo that brought together experts from Bosnia-Herzegovina, Croatia, Montenegro and Serbia for the first time since the end of the war to discuss questions of interregional cooperation. "For ideological and political reasons, Bosnia-Herzegovina is, to some degree, stuck in a cul-de-sac," Schenkel remarks. In Bosnia-Herzegovina the project partners developed strategies for a supraregional road network (see chart) and for efficient urban systems. The planning in Russia focused on improving the flow of supraregional traffic to the St. Petersburg docks.

Güller feels that regional development offers a huge field of activity in the countries of Eastern Europe, even if processes are partially blocked in the two countries he is involved with. "In Russia this is due to the centralised structures and constant changes in the responsibilities of the different ministries," says Schenkel, "whereas in Bosnia-Herzegovina any awkward confrontations are referred to the Stabilisation Force too quickly; the local people responsible solve too few of their problems themselves". Nonetheless, Schenkel is optimistic about Bosnia-Herzegovina's chances in the future, as "the people are very willing to take the initiative".

"We tend to see things as black and white. The collaboration with our Swiss partners has taught me that life is really multicoloured".

Yuri Samokhin

Ruth Rossier

Weekly market in Cluj-Napoca, Romania.

Training for market-compliant agriculture

"Agriculture in Eastern Europe is in a process of radical transformation. Agricultural production is having to adjust to new values such as ecological, economic and social sustainability," says Marlene Heeb of the Research Institute of Organic Agriculture (FiBL) in Frick. Working with partners from Bulgaria and Romania, she and Urs Niggli have laid the foundations for the inclusion of organic farming in agricultural education. Their students showed great interest in the first organic farming courses in Bulgaria and Romania. There is a lot of expertise in both countries, e.g. about special varieties that are important for organic farming. "We try to use this knowledge in Frick as well," the committed microbiologist remarks.

Heeb's Bulgarian partner, Christina Yancheva, has noticed that following global food scandals, the Bulgarian population wants to buy safe food. This is reflected in rising attendance figures at the four organic trade fairs held in Bulgaria to date. "Farmers are discovering new niches in organic farming, e.g. producing organic herbs," Yancheva comments. Apart from the FiBL, she also collaborates with the Swiss College of Agriculture (SHL) in Zollikofen, with which she is revising the curricula of selected courses in agricultural education. "Bulgarian agriculture has to become more competitive in the European market," Yancheva says. "This goal can only be reached by providing education that complies with the Bologna regulations," adds Dominique Herren of the SHL. Together with Roland Stähli, he is assisting researchers from Bulgaria and Bosnia-Herzegovina to overcome hurdles in revising curricula to meet European standards. Whereas

Jean-Pierre Sorg

Urs-Beat Brändli

Left: Harvesting hay is an opportunity to Kyrgyz forest owners to generate additional income.

Right: Primeval beech forest at Mala Uholka, Ukraine, rich in dead wood.

"Development also involves making mistakes; at best we can help to avoid the worst ones".

Walter Schenkel

the College in Plovdiv introduced the reformed courses in September 2004, the educational infrastructure in Sarajevo is still lagging behind international standards. "We are handicapped in that our university was completely destroyed in the war and everything has to be renewed simultaneously," Alexandra Nikolic, a lecturer from Sarajevo, explains.

Ensuring sustainable forestry

Kyrgyzstan also has a long way to go to catch up, above all in the fields of know-how and capacity building. Since 1997, Jean-Pierre Sorg of the Chair of Silviculture at the Federal Institute of Technology Zurich (ETHZ) has been working together with local researchers and forest practitioners in this mountainous Central Asian state. The country is well-known for the species-rich flora of its walnut forests. The research partners are seeking to establish sustainable and social forestry that will generate an income for as many people as possible. The researchers are studying the question of how to get the walnut forests to produce more nuts without reducing the yield of wood. The optimisation problem is typical of Sorg's work at the ETHZ. At testing sites with varying numbers of trees and thinning intensity the researchers study growth and yield of grasses, potatoes and maize. "In this way we obtain basic data on different types of use," Sorg explains. "Today multifunctionality, agroforestry and sustainability are no longer foreign words to Kyrgyz foresters," he is pleased to note, and is sure that this brings him closer to the goal of guaranteeing the farmers a modest degree of prosperity.

Brigitte Commarmot of the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) in Birmensdorf and her Ukrainian research partners do not focus as strongly on economic aspects, although their research in the virgin forests of the Carpathian Mountains also has an economic background. "Primeval forests provide important information for us with respect to our own near natural forest management," the forestry specialist comments.

Uncontrolled exploitation of forests is widespread in the Ukrainian Carpathians. "This has nothing to do with sustainability," says Commarmot. Moreover, large-scale deforestation, obsolete technology and unsuitable methods of timber skidding is causing soil erosion, which is now very obvious after two flood disasters in recent years. Therefore, WSL supports the efforts of the Biosphere Reserve in Rakhiv to protect Europe's largest remaining primeval beech forests. By comparing them with near-naturally managed forests in Switzerland, researchers can demonstrate that there are more alternatives than just "total protection" and "exploitation"; sustainable use of forests is also possible without encroaching on their protective function or biodiversity. A new project supported by the Swiss Agency for Development and Cooperation, in which the WSL is involved in an advisory capacity, seeks to entrench the idea of multifunctional forest management in the Ukrainian Carpathians. In Commarmot's view: "This project serves as a countermeasure to the ruthless exploitation practised by some foreign companies in the timber industry".

Importance of working in partnership

The commitment of Swiss researchers is deeply appreciated in the countries of Eastern Europe. At the beginning of 2004, for instance, the University of Simferopol awarded Martin Boesch of the University of St. Gallen an honorary doctorate for his services in the Crimea. "I take this as an indication of the significance that our Ukrainian partners attach to our joint work," Boesch commented on receiving the award. Many Eastern European partners are impressed by the western system of research planning. "Everything is prepared very carefully and openly, from the project idea, through the methods, to implementation of the results," Velagic Habul from Sarajevo observed.

All partners the Swiss researchers got to know were broad-minded and open people who are increasingly more at ease in the East and the West. Brigitte Commarmot of WSL in Birmensdorf observed "an incredible commitment on the part of individual researchers in the Ukrainian Carpathians". Marlene Heeb of FiBL says in summary that, "unfortunately, there is still far too much prejudice against Eastern Europe in Switzerland. For all that, this collaboration also has enormous potential for our country".

Vladimir Bokov, Geographic Scientist, Department of Geoecology, Taurida National University, Simferopol, Crimea, Ukraine

Eastern point of view

"We take account of people's concerns"

Alexandra Stark

On the Crimean peninsula, Vladimir Bokov is teaching the students how to use the land as sustainably as possible.

Norbert Rütsche

The Southern coast of the Crimean peninsula shows exemplarily how closely developed land (town of Gurzuf) and a nature reserve ("Bear mountain" Aju-Dag) adjoin.

Dr Bokov, how has the project helped sustainable development in the Crimea?

Very directly. Regional planning, as it is practiced in Switzerland, is the basis of sustainable development – it is the foundation. The course developed within the framework of the project enables us to train people so that they acquire this knowledge. Our activities also help to bring to the attention of the relevant government departments that this is an important topic. Up to now that has not been the case.

Could you perhaps explain briefly what the situation was up to now?

In the Soviet era planning was regarded as the basis of the economy and society. At that time, regional planning took place at the highest level, at least in theory. Implementation was another matter, because numerous contradictory measures were put into practice. Under the Soviets, theory and methodology were of the highest level – higher, in fact, than in the West. Regional planning has long been taught at universities, but it was more narrowly defined. While we did include nature conservation areas or even ecological aspects of urban planning, for instance, we never paid attention to architectural and constructional aspects. As the Crimea has neither a university nor an institute of regional planning, it was only logical for our faculty to assume responsibility for this matter when it became clear that it was something that needed to be dealt with.

What have you gained from the collaboration with your Swiss partners?

A number of things! We have learnt a lot in the fields of theory and methodology. We have widened our concept of regional planning so that it now resembles the western approach. Finally, and probably most importantly, we have learnt how to take account of the concerns of the people, of society, at the practical level. This was never part of our practice in the past, a situation that absolutely has to change. This is something we have to fight for.

Are you satisfied with the results?

Completely! We have succeeded in doing everything we set out to do. We have drawn up a curriculum and had it approved by the Ukrainian Ministry of Education. Our 15 lecturers have written ten textbooks together. We have printed 100 copies of each textbook – there was no money for more. The books have been placed in the library, where the students can use them. Some of our staff have visited Switzerland and attended courses there. Our Swiss colleagues have visited us here and held lectures. As we talk, the first students in the post graduate diploma course are taking their examinations. Soon we shall know whether we have implemented our plans properly and managed to train good specialists!

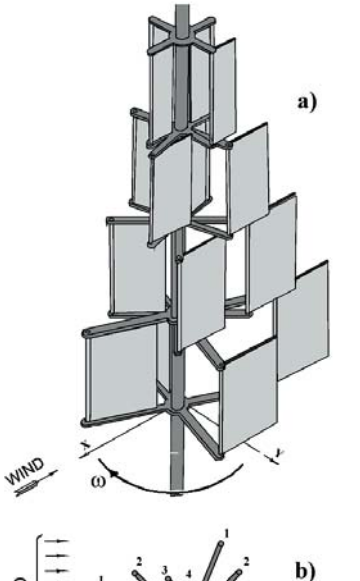
Has the project helped to stabilise your institute's situation?

Definitely. The greatest benefit of the project was not so much the financial resources – they were not all that high – as the access to scientific and methodological techniques and the greater level of recognition. But we are also actively working to ensure that the relevant public and private offices and institutions in the Ukraine hear about us and recognise the importance of our topic. Naturally we make a point of mentioning that we are working with Swiss scientists and university lecturers. This impresses people, and it is psychologically important for our young scientists. Contacts with other scientists motivate them, as the wage is not the only thing: in the Ukraine you can barely survive on a professor's salary. (AS)

“We have discovered that valuable expertise exists in Belarus and that there are some real jewels to be found”. Nicholas Spencer

Different perspectives encourage innovation

It is sometimes difficult for outsiders to see that science is really creating new knowledge. One reason for this is that research topics are often very specific, and it can take a long time to produce confirmed results. Many of the research projects linking East and West, which have generally been of short duration, have produced some novel results. In many instances it was the different backgrounds of the research partners which made it possible.



Carousel wind turbine; a) view from the side and b) from the top. (Fabian Brütsch, Wind Energy Project in Armenia. Armenian Agricultural Academy Yerevan / ETH Zurich, 2002).

When scientists from different countries collaborate, they bring with them specialist knowledge that was generated in different political, cultural and social contexts. This is particularly true of east-west collaboration. Ways of thinking, technical developments, social values and political movements are also reflected in research. These differences can sometimes make international collaboration difficult, but often enough they provide new impetus for research. New questions can produce innovative results within a very short span of time, as the following projects show.

A new device for measuring friction

"My project partner in Gomel, Belarus, is a mechanical engineer and I’m a chemist," explains Nicholas Spencer from the Laboratory for Surface Science and Technology at the Federal Institute of Technology Zurich (ETHZ). "Although we come from different disciplines, we were interested in the same question". Spencer and his group are experts in nanometry and macrometry, while the team working with his partner Nikolai Myshkin from the Metal-Polymer Research Institute at the Belarus National Academy of Sciences specialises in the micro scale. The two groups are working on friction and wear phenomena in materials, and they complement each other perfectly in expertise and experience.

In material science it is important to have extremely precise equipment capable of measuring the surface of solids and fluids exactly. The research partners used existing, tried and tested components to develop a microtribometer, which can measure very fine and thin materials precisely. This device can be used, for example, to determine the wear and tear on machine parts, or in medicine to measure friction on tiny cartilage structures. "We will generate fundamentally knew knowledge about the properties of thin lubricating films which will play a major role in the high-tech science of the future," explains Myshkin with conviction (see report on p. 31). But there is still some way to go yet; the prototype developed during the project must first show what it can do in tests under real-life conditions.

High-quality medical laser

Another link between material scientists has existed since 1987, when Moscow and Bern started collaborating. "That was when perestroika was just starting," recalls Vitali Konov from the Natural Science Centre at the General Physics Institute in Moscow. He and his group are working with Heinz Weber and his team at the Institute of Applied Physics at Berne University to study how novel lasers can be used to process the surface of materials. "We have made a number of discoveries in the course of our work," Konov says. "For example, how lasers can burn microchannels in even the hardest surfaces. If the channels are filled with lubricant, this reduces friction". Weber’s group wants to improve the efficiency of lasers so that they can be used in surgery. "Nowadays lasers are even used in surgery of the inner ear," reports Weber, a physicist whose collaboration with his colleagues in Moscow has taken him some considerable distance forward in scientific terms. "You need completely transparent artificial crystals to make lasers with a good beam quality, and our partners in Russia are specialised in making them," Weber says. But unlike the physicists in Bern, the Moscow group has little interest in using their achievement practically. "Anything intended for subsequent production would diminish

Ivo Bühler

The Lake of Sevan, 2000 m above sea-level, 70 km from Yerevan, the capital of Armenia. As Armenia is a mountainous country, strong winds frequently develop on mountain ridges or in the saddles of mountain passes. The potential for options like geothermal, solar and wind energy seems to be very good (Fabian Brütsch 2002).

"Being able to accept differences is part of the learning process that you go through in collaborative partnerships".

Heinz Weber

their social status," was what Weber learned while he was in Russia. Konov's group is geared to innovative developments of the highest quality, because this will give them more prestige in Russia than applied research and its practical implementation. "So far Russian industry has shown no interest in high-tech," Konov says. "It may sound strange, but I think our results simply came too early to be of any industrial use".

Measuring magnetism in nanometres

"Russia's global standing in physics, mathematics and chemistry is good," says Danilo Pescia from the Institute for Solid State Physics at the ETHZ. "Russian universities have to offer good physicists really attractive conditions to make them stay in the country," he adds. This has long been a major concern for Yuri Mamaev from the Department of Experimental Physics at St. Petersburg State Technical University. Together with Pescia and his colleague Andreas Vaterlaus he has managed to improve working and training conditions at the Russian institution. "So far none of my staff have left," Mamaev reports. "The two SCOPES projects helped us to improve the infrastructure at our faculty to an international standard". He also uses his initiative to find new sources of income. In addition to the university funding that he receives through his collaboration with the ETHZ, scientists working in his team have developed a unique measuring instrument, the "Mott detector", which can be used to measure the spin polarisation of an electron beam. One of the ETHZ's spin-off companies distributes this device internationally.

Thanks to this collaboration, physics training in St. Petersburg has also changed for the better. As in Zurich, physics experiments are now carried out during lectures, and students can get practical experience in special laboratories. Pescia reckons that the institute in St. Petersburg is now working on about the same level as its counterpart at the ETHZ. "I think that the way students are taught is actually better than in Zurich, and the students are very innovative".

Wind energy provides a local power supply

The collaboration between Aldo Steinfeld from the Institute of Energy Technology at the ETHZ and partners at the Armenian Agricultural Academy in Yerevan centres, in the form of wind energy, on physics too. The scientists are looking into whether it would be economically and ecologically viable for Armenia to produce more energy on a decentralised basis using renewable energy sources. Many of the rural settlements in Armenia are very remote. Wind energy systems could provide electricity for the 50 to 100 houses that make up a village and for local agriculture, and the current would then not have to be transported over long distances.

The scientists are more or less entering unknown territory with this project, because electricity in Armenia is currently produced solely from fossil fuels and hydroelectric power. "We have compiled a large amount of meteorological data and now know that there is enough wind and solar energy in Armenia to produce electricity on a regular basis," Steinfeld says. The researchers from Armenia and Switzerland built a prototype carousel-type wind turbine and tested it in the wind tunnel at the ETHZ. "Nowadays there are techniques for producing enough electricity for small settlements even at low wind speeds," is the way Steinfeld sums up the results of a term paper written by one of his students who spent several months in Armenia. Steinfeld says that it would be worth setting up a technology centre to exploit wind and solar energy in Armenia so that the country could gain more experience with renewable energy sources.

Learning from each other about genetic engineering

"Genetically engineering with plants is playing an increasingly important role because modified genes can make plants more resistant to pests or diseases, for example," explains Arkady Sinitsyn, a chemist in the Department of Enzymology at Moscow State University. His team and the geneticist Jean-Francois Manen from the Conservatory and Botanical Garden at the University of Geneva have complementary skills. "We have developed a method for cracking the cell walls of numerous types of plants using

Alexandra Stark

Lutz Heinzl, Glatt International Times

Left: Researching in Moscow: Olga A. Sinitsyna and Arkady P. Sinitsyn are investigating and cracking cell walls.

Right: Natalia Menshutina combines informatics and pharmaceutics offering new e-learning opportunities.

"I love precision and reliability, although people always say the opposite about Russians; the fact is that not all Russians are alike!" Natalia Menshutina

enzymes in order to gain access to their genetic material," is Sinitsyn's brief description of the project. "This provides the biologists and geneticists from Geneva with large quantities of plant DNA to analyse". The outcome of this work culminated in a U.S. patent in 2003. "To the best of my knowledge, there is no institute with comparable experience either in Europe or in America," says Manen, who in the past few years has learned a lot about enzyme cocktails and their effects from his Russian colleagues.

Sinitsyn thinks that a lot of things are happening in the biotech sector in Russia. His team in Moscow seems to be doing well. "Competent specialists don't need to leave Russia because they are collaborating globally," Manen reports. So what is Sinitsyn and his colleagues' recipe for success? "In the late 1980s and early 1990s we never gave up and always believed that better times would come. We followed the traditional Russian saying: if a frog falls into a milk bucket and doesn't want to drown, he has to paddle to make whipped cream".

New e-learning platform for pharmacists

Like Manen, Hans Leuenberger from the Institute of Pharmaceutical Technology at the University of Basel has met scientists in Moscow who have tremendous faith in the future. Leuenberger, a physicist and pharmacist, and his research partner Natalia Menshutina, an expert in informatics from the Mendelev University of Chemical Technology of Russia, have been engaged in interdisciplinary collaboration for years. "Disciplines like the nanosciences and system biology show that sciences such as biology, chemistry and physics are increasingly merging with information technology," Leuenberger explains, adding, "In research, including pharmaceutics, modelling and computer simulation are becoming more important all the time". Leuenberger and his team have learned a lot from their Russian colleagues about artificial intelligence, artificial neuronal networks and database management. Together, the scientists developed an e-based learning and expert system in pharmaceutical technology that is now in use in both Basel and Moscow. "We were especially pleased that the Russian Ministry of Research and Technology awarded us a prize for this e-learning platform," Leuenberger says. "Multimedia teaching modules and e-platforms for distance learning have great potential," Menshutina adds. "In a country as big as Russia, we need to be able to access electronic teaching materials simultaneously from Kaliningrad to Vladivostok".

Collaboration thrives on differences

Many scientists in Switzerland are impressed by the talent for improvisation demonstrated by their colleagues from Eastern Europe. "Necessity is the mother of invention," Leuenberger says, "but this is less evident in contemporary Switzerland because our country has reached a saturation state in which inaction is not uncommon". A lot of scientists from Switzerland have noted that their colleagues from the East go about their work with great enthusiasm and energy. Sergei Pimenov from the General Physics Institute in Moscow believes that one reason for this is the new-found freedom in research: "Recognition and respect are very important, and we found them in collaborating with Heinz Weber and his team. The scientists from Berne never gave us the feeling of being less than equal. We were always taken seriously".

Innovative results frequently emerge in situations in which experts work together on an interdisciplinary basis and their skills are complementary. The different origins and cultural backgrounds of scientists can be an important factor for success. Vitali Konov from the General Physics Institute in Moscow summarises the situation with a smile: "We Russians tend to be the ones who have a lot of ideas, but sometimes we don't have a lot of structure…". Well-adapted intercultural behaviour is what ultimately allows each team to learn from the strengths of the other. Innovative researchers often work at the cutting edge and open the door to others, even in the East. "The first few years are spent building bridges," comments Heinz Weber from Berne University. Hans Leuenberger from Basel University knows that the windows in Russia are wide open to the West in the same way as they were in the time of Peter the Great. "This opens up perspectives for a large, democratic Europe and for closer collaboration".

**Nikolai Myshkin, Mechanical Engineer,
Belorussian National Academy of Sciences, Gomel**

Eastern point of view

“We knew that we fitted together well”

International research collaboration often brings together individuals with complementary knowledge and experience. This regularly leads to innovative developments that are useful for both sides. One example of this is a project in which material scientists from the ETHZ and researchers from Gomel, the second largest city in Belarus, developed a promising measuring device.

Nicholas Spencer from the Laboratory for Surface Science and Technology at the ETHZ and Nikolai Myshkin from the Metal-Polymer Research Institute of the Belarussian National Academy of Sciences started working on micro- and nano-scale friction and wear phenomena (tribology) in September 2001. In the beginning neither had any great expectations in terms of results. "All we knew was that we would fit together well," Nikolai Myshkin recalls.

After only three years, the objectives of the two scientists have been exceeded by far: together they have developed a prototype of a promising measuring instrument that they call a "microtribometer". The intention is for the device to help predict the properties that lubricants and coatings need to have to better withstand friction under extreme conditions. Myshkin uses a dramatic example to explain their work: "Imagine a Boeing 747 flying just 0.5 millimetres above the ground. We want to find out what properties the ground surface needs to have in this case to keep friction and wear to an acceptable level".

Wherever materials are exposed to extreme conditions in high-tech applications, and surface phenomena come into play, the microtribometer should be able to provide important new information. "One field of application will be biomedicine and the whole science of developing artificial joints," Myschkin believes.

In the Soviet era, Myshkin's institute was one of the leading research bodies in Belarus, but after the collapse of the Soviet system, Myshkin and his colleagues were forced to find new ways of funding their research. Once the Iron Curtain had fallen, scientists were able to seek international contacts. South Korea, in particular, became an important partner. "South Korea was heavily industrialised but had too little research in many fields; the situation here was exactly the opposite," Myshkin says. The scientists in Belarus started developing high-tech instruments for companies in South Korea at rock-bottom prices, and the income from this work kept the institute afloat.

These contacts were important financially, but the transfer of knowledge and technology was mostly in one direction only. From the mid-90s, therefore, the Russians were keen to make contact with institutions in the West. When Spencer and Myshkin started working on the properties of limit layers and surfaces of thin films in September 2001 as part of the SCOPES project, it soon became clear that this research was outstripping the possibilities offered by conventional measuring techniques.

Stephan Hille

Nikolai Myshkin with the microtribometer, an innovative result of the partnership with ETH Zurich.

"We soon found that we needed an innovative measuring device, one that would take over where existing methods left off," Myshkin remembers. The scientists have now built a prototype of the "microtribometer". Myshkin describes it with a certain amount of pride as "a unique measuring device in the field of tribology". Most of the microtribometer project was carried out in Gomel. The objective is now to run new test series as part of a new project to refine the equipment.

There is already outside interest in the project: Myshkin is working with 20 institutes in a number of countries on a tribometer commissioned by the Russian space authority which is destined to be used in the international space station ISS as early as 2006 or 2007. (SH)

"Without patients doctors are simple citizens. Respect for the patient is always necessary". Narine Manukyan

Researching for better health

During the Soviet era, most of the countries in Eastern Europe provided adequate medical care for their citizens. Once the Berlin Wall came down, however, the health systems in most of these countries went into a rapid decline. The medical infrastructure was hopelessly outdated and there was no money for new equipment. Research, too, was left without funding. Anyone who was able tried to team up with foreign research partners.

Once the countries in Eastern Europe became unable to provide reliable medical care for their populations, it was only a matter of time before the health of large groups of people worsened dramatically. Natural disasters, pollution and social problems compound the situation and in many instances lead to a serious reduction in life expectancy. There is much work to be done by both practicing doctors and their counterparts in research in many regions in the East, but financial resources are very limited. Collaboration with doctors from western countries can help to improve the situation and to promote research as the following examples show.

Better treatment for children with kidney disease

In December 1988 Armenia experienced its worst earthquake for many years. A third of the country was devastated; more than 50 000 people lost their lives as a result of this extreme natural disaster; hundreds of thousands were injured and lost their homes. It was a major challenge for the country's health service, and help from other countries was both necessary and welcome. It was this national emergency that first brought Ernst Leumann from the University Children's Hospital in Zurich to the smallest socialist republic of what was then still the Soviet Union. His involvement was the start of a partnership with numerous healthcare professionals and social workers in the Armenian capital Yerevan – a partnership that has now lasted for 16 years. Leumann explains: "We have achieved a great deal together in this time. One of the things we have done is to set up a department of nephrology at the hospital in Yerevan to treat children with kidney diseases". He is extremely proud of the fact that the doctors from Zurich have been able to work on a SCOPES project, helping to reinforce teamwork at the hospital and to improve its organisation. "Today we're a team, before we were a group of individuals and experts," says Narine Manukyan, senior physician at the Arabkir Joint Medical Centre in Yerevan.

The researchers from Armenia and Switzerland expanded their activities to include new partners in Moldova and Ukraine. "I had specific ideas of what in-service training doctors should receive and also expected a change in mentality to come about during the project," emphasises Leumann. His research partner Iryna Derkatch from the Lviv City Children's Hospital in Ukraine says, "we found that we are able to help each other. That's incredibly motivating!" (See report on page 19).

As in Yerevan, the teams of doctors in Lviv and at the Chisinau Medical University in Moldova will soon be able to carry out kidney biopsies on children themselves. "Until now, patients have had to travel to Romania or Moscow,"

Alexandra Stark

The “deer”, a compound microscope at Lviv City Children’s Hospital, helps to educate two health professionals at the same time.

Stephan Hille

Grigori Dovgyallo from the, in the meantime, closed Theology Department of the European Humanities University in Minsk, discussed the role of faith in palliative care with other theologians during two international conferences in Minsk.

says Svetlana Dumitras from Chisinau, who saw her first live biopsy in June 2004 at the University Hospital in Zurich. The infrastructure has also been improved during the project, "but only to a modest degree because that sort of thing quickly becomes very expensive in medicine," says Leumann by way of explanation. Additional sources of funding have provided Derkatch in Lviv with an ultrasound probe to examine babies, for example, and the hospital in Yerevan now boasts a modern X-ray unit.

Palliative care for young cancer patients

Years of collaboration with a team of doctors from Switzerland and a psychologist from Rostov on Don State University in Russia have managed to establish teamwork as the norm at the Belarussian Children's Hospice in Minsk too. As in Armenia, the patients here are children and adolescents who are suffering in the aftermath of a catastrophe, although here the disaster was man-made. Some of these young people in Minsk are suffering from the effects of radiation unleashed by the explosion of a reactor in Chernobyl in 1982. However, these youngsters have no prospect of ever being cured. Eva Bergsträsser from the University Children's Hospital in Zurich and Walter Schäppi from the Swiss NGO "Doctors for Environmental Protection" are also involved in this project.

The work done at the Minsk Children's Hospice revolves around young cancer patients whose suffering can be made more tolerable, it is hoped, by new forms of therapy and treatment strategies. Schäppi describes this new approach as follows: "When doctors, psychologists, social workers, pastoral workers, finance specialists and other experts look after the needs of terminally ill patients with the aim of improving their quality of life, we refer to this as palliative care".

The Swiss partner organisation and the team at the Children's Hospice in Minsk have held two international conferences to make palliative care more widely known to a large number of doctors, and a third is planned for 2005. These events target researchers, clinicians and specialists from government ministries in Minsk. The first two were also attended by theologists from east and west. Erich Bryner from the Zurich-based association "Faith in the Second World" says that faith plays a particularly significant role in the final phase of a person's life.

"Palliative care is no longer a foreign concept in Belarus and the neighbouring countries," says Schäppi. "The hospice is recognised as a centre of excellence in the country and beyond". "Yes, we are accepted," says Gorchakova, who fights day in and day out to enable children to live their remaining days in dignity (see report on page 35).

Gorchakova and Schäppi's numerous contacts to medical, administrative and political bodies are absolutely vital in the search for funding. "Because we are working with sick children we can also reach people at an emotional level. This puts us in a relatively good position when it comes to finding sponsors," Schäppi says.

Radioactivity - a silent risk to health

"Safe drinking water is going to be a very hot topic in the future and consultants will be in demand in Eastern Europe," says Eduard Hoehn from the Swiss Federal Institute for Environmental Science and Technology (EAWAG) in Dübendorf. According to Vyacheslav Rumynin from the State University in St. Petersburg, one of Hoehn’s research partners: "In our country there are a whole series of test zones containing radioactive waste, and the groundwater in these areas is heavily polluted with radioactivity". The two scientists are gathering information on the way harmful radionuclides spread in groundwater. Jürg Beer from EAWAG also investigated the transport of radionuclides in water flows in conjunction with Russian and Slovakian partners in the late 1990s. They carried out experiments which showed how the radioisotope chlorine-36 is transferred in nature.

Large quantities of caesium-137 were deposited in the soils of South East Belarus after the Chernobyl catastrophe. Emmanuel Frossard and Hannes Flühler from the Institute of Plant Sciences and the Institute of Terrestrial Ecology at the Federal Institute of Technology Zurich are studying with their colleagues from the International Sakharov Environmental University in Minsk the processes that control the transfer of caesium-137 from the soil to agricultural plants in order to verify whether the models used to calculate the transfer of caesium-137 in terrestrial systems are founded on relevant hypotheses. They are specifically addressing the role of soil structure in caesium-137 distribution in the soil and its uptake by plants. The partners hope that the results of this work will ultimately help to better predict the amount of radionuclide that ends up in our food.

Anne-Laure Terrettaz-Zufferey

Anne-Laure Terrettaz-Zufferey

In many villages in the Kyrgyz countryside, potable water needs to be carried from public water taps into private houses. The water supply, in general, is good but at some places the water is polluted.

"The experience gained in Belarus is also important for the implementation of practical palliative care in doctors' practices and hospitals in Switzerland".

Walter Schäppi

Fewer abortions thanks to prevention

The former Romanian head of state Nicolae Ceauşescu wanted to increase the birth rate in his country and forbade any form of birth control. The only option open to numerous women with unwanted pregnancies was to seek an illegal abortion. "As a result, 148 women died per 100 000 live births in Romania in 1989," explains Frank Lüdicke, who worked with partners in Romania in the field of reproductive health on behalf of the Gynaecological Hospital at Geneva University. Lüdicke and his research partner Mihai Horga from the East European Institute for Reproductive Health in Targu Mures, Romania, generated a tremendous response with their work. "We produced a family planning manual in conjunction with eight hospitals attached to six medical universities," Horga says.

The researchers' success was due largely to the snowball principle: first they wrote the manual, then they organised a large number of seminars to train both "trainers of trainers" as well as specialists in family planning. The specialists then acted as multipliers in 150 family planning clinics throughout the country. In this way Horga and his team managed to completely change the face of family planning throughout the country in a very short time.

The result of this preventive campaign is impressive: "In 2002 just nine women per 100 000 live births died as a result of an abortion, considerably fewer than in 1989 but still far more than in Western Europe," Lüdicke says. The abortion rate decreased between 1990 and 2004 from 164 to 32 per 1 000 women of child-bearing age. During the same period the number of people using modern contraceptive methods rose from zero to between 50 and 60 percent.

"Our activities have been a real success," exclaims Horga delightedly. The partnership with Geneva University enabled him to systematically train his team of employees and to improve the infrastructure. Today, the Institute is the only one in Romania that collaborates with the World Health Organisation in this field. The family planning manual is also being used in neighbouring Moldova.

Bad health risk due to pollution

In many Eastern European countries the environment is polluted by toxic substances to an extent that can cause local health problems. In many instances, however, the population is not aware of the risks to which it is exposed. Michel Maignan and Anne-Laure Terrettaz-Zufferey from the Institute of Mineralogy and Geochemistry, University of Lausanne, are working with partners from Kyrgyzstan on environmental and health data from the region around Issyk-Kul, the largest lake in Kyrgyzstan. "Mobility in the population is low here, so it is easy to identify connections between illness and certain environmental factors," explains Terrettaz-Zufferey, who used statistical and geoscientific methods in her work with local partners. The scientists identified clear correlations between environmental pollution around the lake and disease patterns: in the vicinity of a coal mine, for example, there was a high incidence of respiratory disease; a cluster of radon sources was associated with a high incidence of people with adenopathy or anaemia; and there was a strikingly high number of people with intestinal disorders in areas with no waste water treatment facilities or with malfunctioning water pumps. These findings enabled the research partners in Kyrgyzstan to provide better training for local doctors and to take preventive measures. This work has also made it easier to search for the causes of other health problems. The scientists and authorities in Kyrgyzstan hope that this will increase their chances of gaining international aid in eliminating sources of risk.

Focusing on people

These examples of medical collaboration show that the researchers do not limit their activities to identifying deficits or problems. Their interest is much more in helping as many people as possible on a local basis. "Once again, I have seen how minimal resources can be made to go a lot further, how decent medical care can be provided with limited input," says Ernst Leumann from the University Children's Hospital in Zurich. People are the focus of these projects. Narine Manukyan from Yerevan puts it succinctly: "It doesn't matter in which country we work as doctors, we always have to keep in mind that in front of us is a patient, an individual person, be it a child or an adult 100 years old".

Anna Gorchakova, Psychologist,
Belarussian Children's Hospice, Borovlyany/Minsk

Eastern point of view

For a dignified life until the end

Stephan Hille

Anna Gorchakova in front of the rebuilt Children's hospice in Borovlany/Minsk.

Stephan Hille

Sascha who suffered from leukaemia.

Sascha lies in his bed and grins into the camera. He's just told another joke and made his parents laugh. "You're going to be a big star," laughs Anna Gorchakova, a graduate psychologist and head of the Belarussian Children's Hospice near Minsk. Sascha is 18 years old, and three days a week he comes to the hospice for a blood transfusion. Sascha has incurable leukaemia and is in the terminal stage of the illness. Sascha and his parents get ready to go out for a walk. They want to live as normally as possible for as long as they can.

"We can't cure these diseases," Gorchakova says. "Our aim is for patients and their families to have as much quality of life as possible and to enable them to live in dignity until the end". Gorchakova is Director of the Children's Hospice, the first palliative care centre in Belarus. She is 47 years old, and set up the hospice for children with incurable diseases and their families ten years ago. "I wanted to help children with no chance of a cure and their families," Gorchakova says. It is the only facility of its kind in the country.

The centre in Minsk is currently caring for 51 families, most of them in their homes. It offers medical, psychological, social and spiritual assistance. Theology students help patients, a doctor is always on call and a lawyer is available when needed. The care, which includes group therapy for bereaved parents, is provided free of charge. The hospice has three rooms to accommodate patients who have come a long way. Sascha and his parents, for example, live in Grodno near the Polish border, 260 kilometres from Minsk.

The Director and her team were only able to set up and run the Children's Hospice thanks to donations from the West. The major sponsor so far has been the European TACIS fund. Any money obtained from abroad has to be approved by the Belarussian bureaucracy so that it is not taxed before it reaches the hospice. The centre receives no financial support from the state. "I'm happy if they just let us get on with our work," Gorchakova says.

Collaboration with Swiss partners, principally the NGO "Swiss Doctors for Environmental Protection", has enabled Gorchakova to increase awareness of palliative care, and hence its acceptance, in Belarus. In 1999, she and her Swiss partners organised the first specialist conference in Minsk. The partnership flourished and finally led to a SCOPES project in which the Children's Hospital at Zurich University, "Swiss Doctors for Environmental Protection" and the theological institute "Faith in the Second World" also participated.

"In the beginning we were just a hospice, now we're a scientific institution as well," Gorchakova says. The hospice was recognised by the Ministry of Education as a post-graduate medical training centre in 2000. Doctors and nurses from all over the country regularly attend two-week diploma courses in palliative medicine and care. Interest in this training is enormous. "We've already had to set up waiting lists," Gorchakova says. The 47-year-old is unwavering in her dedication, and works as the centre's head, lecturer and psychologist – all at the same time. The phone never stops ringing, and the list of minor and more serious problems that crop up is endless.

The hospice had to start paying rent six months ago, so it moved to Borovlyany on the outskirts of the city, where financial aid from the West enabled Gorchakova to buy a three-storey house. She stands in the yard, watching labourers renovating the building. Sascha comes back from his walk laughing, and that is the biggest reward of all for Anna Gorchakova. (SH)

* Note: Sascha died one week after we visited the hospice.

"There is a huge gulf between Eastern European daydreams and reality in political scientific terms". Klaus Armingeon

Changing societal values

Since the end of state socialism, social and political life in the countries of Eastern Europe is no longer the same. People and institutions are caught up in processes of radical change. Researchers in the social sciences are analysing these developments, and some of them venture predictions about what is still an uncertain future.

The Comparative Data Set for 28 Post-Communist Countries, 1989–2004, is a collection of political and institutional data assembled in the context of the research project "Forms of Government. A Comparative Data Set for 28 Eastern Countries," directed by Klaus Armingeon and funded by the Swiss National Science Foundation. The data set contains additional demographic and socio-economic variables, i.e. the number of women in parliament, unemployment rates, names and terms of office of political leaders and election results from as many regions as possible (www.ipw.unibe.ch/mitarbeiter/ru_armingeon/CPD_Set_en.asp).

Students in front of Tbilisi State University campus where the faculty of law is accommodated.

In the late 1980s, "Perestroika" and "Glasnost" heralded imminent change in Eastern Europe. This was the beginning of a period of upheaval in the former socialist societies. The change in familiar values and structures has been determining political and social events, and the processes associated with them are becoming increasingly transparent; more and more people are playing a role in shaping them. This is affecting legal norms and government policies, migration and the population structure, the economy, the labour market and financial flows. This change also poses challenges for academia and research, as the following examples illustrate.

New nuclei in political research

What institutional orders are developing in the post-communist countries, how are majorities formed and political negotiations conducted? To answer such questions one needs reliable demographic, social and economic data. Klaus Armingeon of the Institute for Political Science, University of Berne, and his Romanian research partner, Romana Careja of the Babes Bolyai University in Cluj Napoca (see interview, p. 38), have compiled such data and made them available in an Internet database. Armingeon believes: "This database fulfils an informative function for political scientists and other groups in society as well, because the data can be verified".

In Armingeon's view, the Iron Curtain was not torn down in 1989–90, but only moved farther east. He believes that the non-EU countries in particular will have a long and stony path to stable democracy. "Democracy is almost impossible in poor countries," he says, because for the most part democracy requires a certain degree of economic prosperity before it can take root. The ruling elites have little interest in democratic development. In contrast, at the scientific level Armingeon observes "how new nuclei are starting to grow in various Eastern European institutions and develop into competence centres".

Developing a new legal basis

Walter Kälin of the Institute of Public Law, University of Berne, is convinced that a nucleus of this nature has been developing in Georgia for some years. Kälin works with research partners in Tbilisi on questions of regionalisation and decentralisation in Georgia to develop a concept on communal autonomy and the territorial reconstruction of the country. The Georgian project partners presented the concept to the national constitutional commission, which is still deliberating. This may well be an instance of a politically effective research input: "The fact is", Kälin reports, "that Georgia is too decentralised; since the breakaway of South Ossetia and Abkhazia it has been threatened by breaking apart". In his opinion, the country still bears the legal and political scars of the (post) Soviet legacy of centralisation.

The project gave Kälin's partners access to modern legal literature and new methods of research. The partners have already planned their next step together, Kälin comments: "A credit from the Swiss Department of Foreign Affairs will enable us to work on topics relevant to the constitution, and in Tbilisi we are in the process of setting up a one-year post-graduate course on public-law issues for lawyers from the southern Caucasus".

Democracy is more than just freedom

More than a decade after the collapse of the Soviet Union, the question of how 290 million people will find a new identity has still not been answered. In each of the successor states, the concept of na-

David Kikodze

Hay harvest in Transsilvania, Romania.

Ruth Rossier

tionality needs to be given new meaning, and to find a place in the heads and hearts of the people. "International organisations have invested a lot of money and effort in the democratisation of society and politics," says Carine Bachmann of Cimera, a Geneva-based NGO active in the southern Caucasus. Bachmann observed that there were few empirical data on what people understood by the concept of citizen. Together with Christian Staerkle and Willem Doise of the Department of Psychology, University of Geneva, and partners in Baku (Azerbaijan), Tbilisi (Georgia) and Yerevan (Armenia), she surveyed students' views on this topic in these Caucasus republics. According to the results, the respondents equated democracy above all with freedom and are not really aware of the importance of co-determination and their own civil duties. The project partners think it would be reasonable to formulate policy recommendations on the basis of the data they have analysed, and make these available to the political institutions in the respective countries as well as to development organisations.

Emigrants support Armenia

Since the massacres of the nineteenth and twentieth centuries, many Armenians have lived in the Armenian diaspora all over the world, still retaining close contacts with their homeland. There has been another wave of emigration since 1991, mainly for economic reasons. And once again large sums of money are flowing back to help reconstructing the home country. Wolfgang Polasek of the Institute of Statistics and Econometrics, University of Basel, and his research partners in Yerevan have conducted a statistical analysis of the flow of emigrants and the money they send back. They collected employment and other economically relevant data in the countries of immigration and in Armenia. The surveys show that the majority of emigrants are intellectuals and entrepreneurs with a high income.

The reseachers established that some of the official data are inaccurate. For example, the official figures for emigration are substantially lower than the one million inhabitants that have in fact left the country since 1994. The Armenian partners learned international econometric methods and the significance of comprehensible data. Polasek assumes that this progress will influence future statistical surveys in Armenia.

Agricultural development impossible without women

The objectives and content of social scientific research in the countries of Eastern Europe prior to 1990 were different from those after the fall of communism. "Sociology in rural regions, for instance, was not a topic of research in Romania," says Ruth Rossier of the Swiss Federal Research Station for Agricultural Economics and Engineering (FAT) in Tänikon. Working with research partners from Cluj-Napoca (Romania) and Porec (Croatia), she built up a documentation centre for agricultural sociology in both of the countries to promote and expand training and research in this field and support the transfer of knowledge from research to agriculture.

The processes of transformation in agriculture affect women particularly severely. Potentially, research on these topics has great economic and social relevance for the future, as women's influence on development in rural areas is considerable, for example in tourism and in food supplies. Rossier draws parallels between Croatia, Romania and Switzerland: "As in Croatia and Romania, social research on women in rural areas in Switzerland is not institutionally embedded either". Yet such research would provide the foundations for improving change management in rural structures.

Researchers on the receiving end

The conditions for east-west projects on issues in the social sciences are different from those for, e.g. topics in the natural sciences. System-immanent political and economic ideologies and people's concomitant life experiences play a role in the social sciences, and researchers in these disciplines are both the subject and object of their research. Hence, work on such projects requires a certain degree of detachment and abstraction on the part of researchers and integrity in the analytical evaluation of the data.

In some places the social sciences are still in their infancy, although many institutions already have well-trained specialists. Research partners from the West play a significant role in enabling such nuclei, as Klaus Armingeon of the University of Berne calls them, to take root and realise their potential. In doing so, they help "to prevent the disappearance of these scientific disciplines in the countries of Eastern Europe, because researchers find work in other fields or countries" as Wolfgang Polasek from Basel puts it.

Romana Careja, Political Scientist,
Babes Bolyai University, Cluj Napoca, Romania

Bild: University of Berne

Romana Careja and Klaus Armingeon who collected social and political data of 28 post-communist countries.

Eastern point of view

"Everything has changed in Romania"

Romana Careja, how did it come about that you started to co-operate with Swiss scientists?

For me co-operation started, let us say, by chance. Professor Armingeon needed a person in Eastern Europe with research interests in transition and transformation processes and, through one of my colleagues at my home university, he found me. The first aspect that attracted me was the project's general aim of gathering a large quantity of information for further analysis. In addition, there was the exciting prospect of networking with scientists, which gives access to the directions in which one's field of interest is developing. I am also interested in acquiring specific research skills. They include gathering data and critically assessing sources; comparing different sources and deciding which ones are the most accurate; and paying attention to details, without losing sight of the broader scheme.

What does the Internet database on election results and the type of leadership in 28 eastern countries, a result of your joint work, achieve in the East and in the West?

A database of comparative data across both time and space is the dream of any political scientist working in the field of comparative politics. It provides a starting point for any further search for information. Both western and eastern academic communities can save a lot of human and financial resources by accessing the on-line database.

Will the database be able to influence societal and political development?

I expect that the database will be accessed mostly by political and social scientists. Hopefully, people from governmental institutions will find it useful as well. Its impact depends entirely on how the experts use it.

What was your scientific network like before you started to co-operate with the University of Berne and what is it like today?

Before starting my co-operation with the Institute of Political Science in Berne, I was communicating mostly with Romanian political scientists. I also had several contacts abroad, usually scientists who had visited my home university in Cluj Napoca. The collaboration with Berne is an excellent opportunity for me to get in touch with political scientists from different countries and exchange knowledge and views.

So, you have realised your overall project goals?

In terms of the SCOPES project we have realised our overall project goals. The database is on-line and, as the page visits show, people have started to use it. What remains is to use the database myself, and start writing my own comparative studies.

What is the situation in the social and political sciences in Romania?

Social sciences in general were one of the most developed fields in the Romanian academic environment. Before 1989, the content and the output of this field paid a heavy tribute to the political ideology of the country. This is not the case since 1989, and the social sciences have become even more diversified and, therefore, more attractive to students.

What has changed in Romania's societal system?

Well, in short: everything has changed. Formerly individuals' lives were organised in detail by the Communist Party. Today, Romania is a society in which individuals are practically free. The changes are both for the better and for the worse. A formerly egalitarian society is turning into an increasingly diversified and stratified one. Individuals and groups struggle to impose themselves or their views. Other groups are the so-called "losers" of transition and expect the state to provide relief. It is a very dynamic time.

What is the employment outlook for political scientists in Romania? Will it be easy for you to find a job?

Governmental and non-governmental organisations are heavily recruiting among students with a background in the political and social sciences. Formerly, kinship and patron-client networks were the most important ways to get positions and to build a career; recently, this has begun to change. So, in the light of the professional experience which I am accumulating, I am convinced that I have a good chance of finding a challenging job. (RL)

“We want to improve objectivity to prevent a new ideology from infiltrating the recently won openness”. Anke von Kügelgen

Preserving cultural and religious assets

As recent years have made abundantly clear, political and economic change sometimes takes place very quickly. Culture and religion, by contrast, often remain constant factors through the ages. The opening up of Eastern Europe has granted researchers new access to ancient cultural legacies and religious roots. While this has helped to revitalise some of these phenomena, others are still in decline or threaten to be forgotten.

The countries of Eastern Europe are a gold mine for researchers in the humanities and the social sciences, simply because these fields were neglected during the Soviet era and the changes in recent years have raised new questions. As Pierre-Luigi Dubied of the University of Neuchâtel observes: "In Soviet times research in the humanities and the social sciences was limited to what was consistent with socialist ideology. It was virtually impossible for any critical thinking to develop; nor was there any exchange with western countries with similar intellectual traditions". Four examples of east-west co-operation demonstrate how neglected topics have been rediscovered and current topics have been taken up.

Saving Macedonian song treasure for posterity

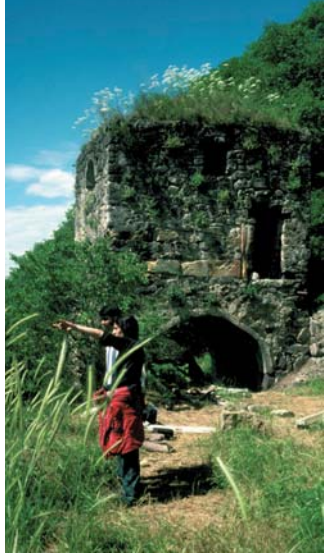
As changes in society are also reflected in music, music is an important documentary source. As a result of the radical political changes in the southern Balkans, there was a very real danger that ancient Macedonian folk music would die out. To prevent this, Dieter Ringli and Ernst Lichtenhahn of the Ethnomusicological Archive of the University of Zurich and their research partners at the School of Music at the University of Skopje have stored 1300 folk songs from the collection of a deceased Macedonian ethnomusicologist in a database. The variety far exceeds their wildest expectations. "This puts us in a position to take a far more differentiated view of the complex development of Macedonian musical culture than has been the case in the past," commented Ringli.

The Zurich ethnologist feels that for too long Macedonian social and cultural researchers have failed to view their own cultural heritage in a critical light. In many places, the approach is still openly nationalistic; compared to foreign customs, the indigenous culture is presented as superior. Macedonian song is an exemplary means of qualifying such assessments, for this culture has much in common with the cultures of the Greeks, Albanians and Roma. Ringli continues: "Thus, for Macedonia, a society walking a tightrope in its search for a national identity, this insight is a contribution to conflict prevention and promotes tolerance and openness towards minorities and neighbouring states".

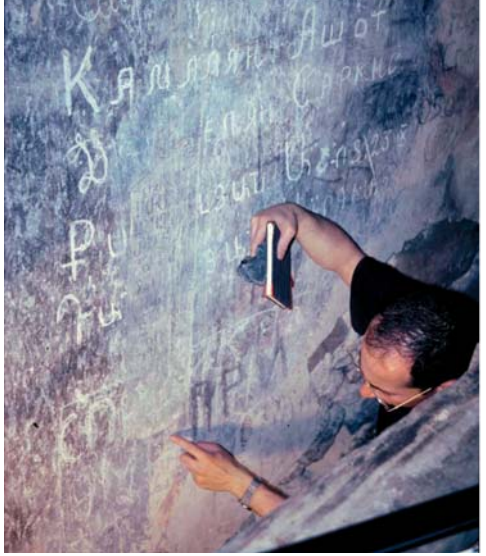
Rich cultural heritage in Georgia

Konrad Zehnder of the Institute of Monument Conservation at the Swiss Federal Institute of Technology Zurich (ETHZ) and his research partners in Georgia also saved cultural assets from being forgotten. They have been tracking down unknown and unresearched cave settlements and other historic monuments. "With respect to its many cultural treasures, Georgia is a very rich country," says Zehnder, "even if some of them are in a critical state because there is not enough money available for the preservation of historic monuments". In the course of the project, Georgian researchers excavated 35 caves and found 40 bronze-age earthenware shards and more than 500 medieval objects. "These discoveries have taught us a lot about early medieval life in Georgia," said Zehnder’s research partner Lado Mirianashvili from Udabno, a Tbilisi-based scientific fund (see interview on p. 41). The excavations provided an exciting working environment for three PhD students in Georgia. In addition, by widening this research to include damage and hazard analysis, Zehnder got to know impressive architectural monuments that used special construction and painting techniques. In reciprocity, the researchers from Georgia visited architectural monuments in Switzerland.

Finally, the research partners also discussed the question of how to make more of this cultural heritage accessible to eco-tourism embedded in sustainable



Konrad Zehnder



Konrad Zehnder

Left: The Southern entrance tower of the 13th century Pirghebuli monastery settlement, Georgia.

Right: Temo Jojua, an art historian, while investigating frescoes at Pirghebuli main church.

Alexandra Stark

Alexandra Stark

Left: Entrance of a former Madrasah, a Koran school of the Mosque, in Buchara, Uzbekistan.

Right: Folk dancers from Samarkand, Uzbekistan.

regional development. People interested in seeing cultural assets of this nature generate a modest local income that can be used to care for and preserve these historical sites.

Countering historical bias

Apart from an academic interest, Anke von Kügelgen of the Institute for Islamic and Middle Eastern Studies, University of Berne, has a sociopolitical reason for collaborating with researchers in Kazakhstan and Uzbekistan. "We want to help to prevent historical bias in national Soviet and post-Soviet historiography, i.e. the corruption of the facts of what actually occurred in history," says the committed academic. Against this background, the research partners have reappraised certain aspects of the religious history of the late 19th and the 20th centuries that were disapproved of in the Soviet era. According to the Islamic scholar, "our priority is to preserve knowledge and make it accessible to a broad public". The team's first book is a mystical work about a figure that the Russians fought in an uprising in 1898 and who today is said to be a national hero in Uzbekistan. The manuscripts for another two books have already been completed. All the texts will be published in Russian – still the lingua franca of Eastern Europe. "By publishing these works we are making a contribution to objectivity in historiography, and in doing so we are helping to ensure that the new openness is not curtailed by a new ideology," von Kügelgen adds. The joint project has strengthened the position of von Kügelgen's research partners, which, she says, "increases their chances of getting research funds".

Reawakening of theology and religion

With the collapse of atheist Soviet rule, it was suddenly possible again to ask questions about the Christian heritage in Russian literature, culture and politics which had been pent up for decades. However, as Pierre-Luigi Dubied of the Faculty of Theology, University of Neuchâtel, observed, attempts to answer them lacked both a tradition of intellectual analysis of such questions and the methodological tools. But the new interest in religion and theology also had a practical dimension: (pseudo-) Christian groups from abroad had started to do missionary work. Parents and (university) teachers were practically incapable of opposing them.

"People who recognise that their culture and that of their neighbours have the same roots promote tolerance and openness towards minorities". Dieter Ringli

In view of society's huge need to deal with religious questions, Dubied successfully collaborated with researchers at the University of Kurgan in south-western Siberia to create the Centre for Religious Studies. In the course of this partnership, the Faculty of Theology and World Cultures of the Omsk State University in south-western Siberia also received support in the shape of material assistance and scientific exchange. Under the leadership of the Neuchâtel theologian, about 30 Russian scientists visited Neuchâtel to learn hermeneutic methods of analysing, interpreting and recognising religious and theological references in texts, traditions and conventions. Despite contacts, both institutions are independent of the Russian Orthodox Church. Dubied remarks that the church will have to accept modernisation processes: "If they want to continue to back people in their religious sphere, they have to open up to social questions and break away from their current nostalgic practices".

The researchers from Neuchâtel have also opened up to Eastern Europe. They have expanded their curriculum, offering, for instance, a seminar on Christianity in the writings of Dostoevsky and include more readings from Russian authors in their lectures.

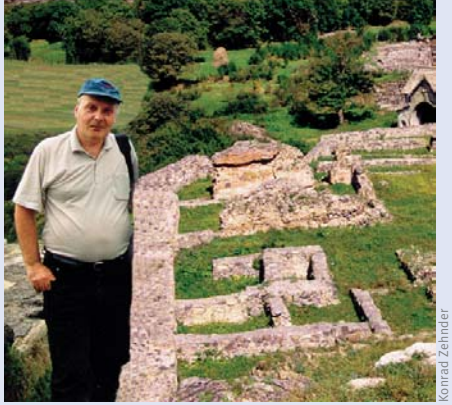
Existential concerns influence research

In the aforementioned examples, the research teams have managed to tide themselves over financially. Anke von Kügelgen of the University of Berne has noticed, however, that for many researchers scientific work no longer has priority, because lack of money has forced them to take a second job. As a result, the Islamic scholar sees the danger of "the humanities losing ground in the post-Soviet developments in the countries of the East". Yet, even though state support for research is still very much on the low side, the political and economic situation appears to be stabilising, an observation Konrad Zehnder of the ETHZ has made in Georgia. East-west projects enable many researchers to at least keep a finger in the scientific pie. This modest financial security and the possibility of further training abroad are often enough to keep researchers from drifting off into the private sector.

Lado Mirianashvili, Art Historian,
Georgian Fund of Science 'Udabno', Tbilisi

Eastern point of view

Increasing international interest in Georgia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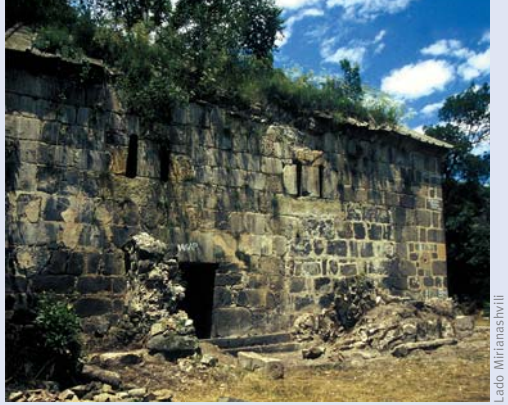

Lado Mirianashvili

Lado Mirianashvili in front of the excavation of Dmanisi, Georgia (6th c.) and the ruins of the medieval city in the background (left). Dmanisi is supposed to be the oldest hominid site found in Eurasia to date. View of Pirghebuli main church (right).

Dr Mirianashvili, Georgia has an immense cultural heritage. How many monuments need to be taken care of in Georgia?
We have an incredible number of important monuments! Georgia was christianised in 326. Thus, we have, for example, countless early medieval churches.

How many are currently being worked on?
In the past ten years we have worked on hardly more than ten historic monuments – far too few. Previously we had enough money to pay for conservation and restoration. Since the economy collapsed the situation has deteriorated.

What does that mean for the preservation of historic buildings and monuments?
I do not think that official institutions are in a position to look after them. Nor does the Georgian church, the Patriarchate of Georgia, have the necessary means. Therefore the population is also called upon to take a greater interest in its cultural heritage. The number of New Georgians, nouveaux riches, interested in building churches is booming. Unfortunately, they are more hesitant when it comes to restoring old churches.

Some historic buildings and monuments are not well-preserved. Is it due to the lack of money?
The government is well aware of the importance of preserving cultural assets. For economic reasons, however, they can do no more than provide financing for emergency situations. Monuments listed by UNESCO as world heritage sites are in a somewhat better position. Unfortunately, though, far too few are on this list.

To know something's history is to know its roots, its culture and its identity. Has the project helped to improve knowledge about the culture of your country?
Of course! For example, the monastery complex of Pirghebuli was not only a monastery, but also included a fortress. Our work has also unearthed a picture of devastation: a massacre of the population by invading Mongols in the fourteenth century. We have learned a lot about monastic life and discovered evidence of a long-forgotten noble family who did a lot for the country.

What has your country gained through this scientific co-operation?
The project has made it possible for us to introduce innovative methods in the evaluation of damage and to define a conservation strategy to enable us to look after our cultural heritage better. It is hoped that the publication of a book summarising the results of our research will help to establish uniform standards for conservation work in Georgia. Up to now, private organisations have carried out such work, and each is convinced that its methods are the best.

Has the project helped you to attract more money?
Yes, but only from international donors, not from the government. It is unlikely that it will be in a position to provide adequate resources in the next ten years. Nor are there any foundations in our country. Thus, our life is a constant struggle for survival.

Do you have any ideas about how you could finance your research? What are the prospects of, for instance, cultural tourism?
We have given some thought to offering eco-tourism in David-Gareji. However, tourists have been few and far between in the past ten years on account of the unstable political situation. International interest in Georgia is now on the increase, and we believe that the current political tension in South Ossetia will soon die down. (AS)

Investment, activities and countries

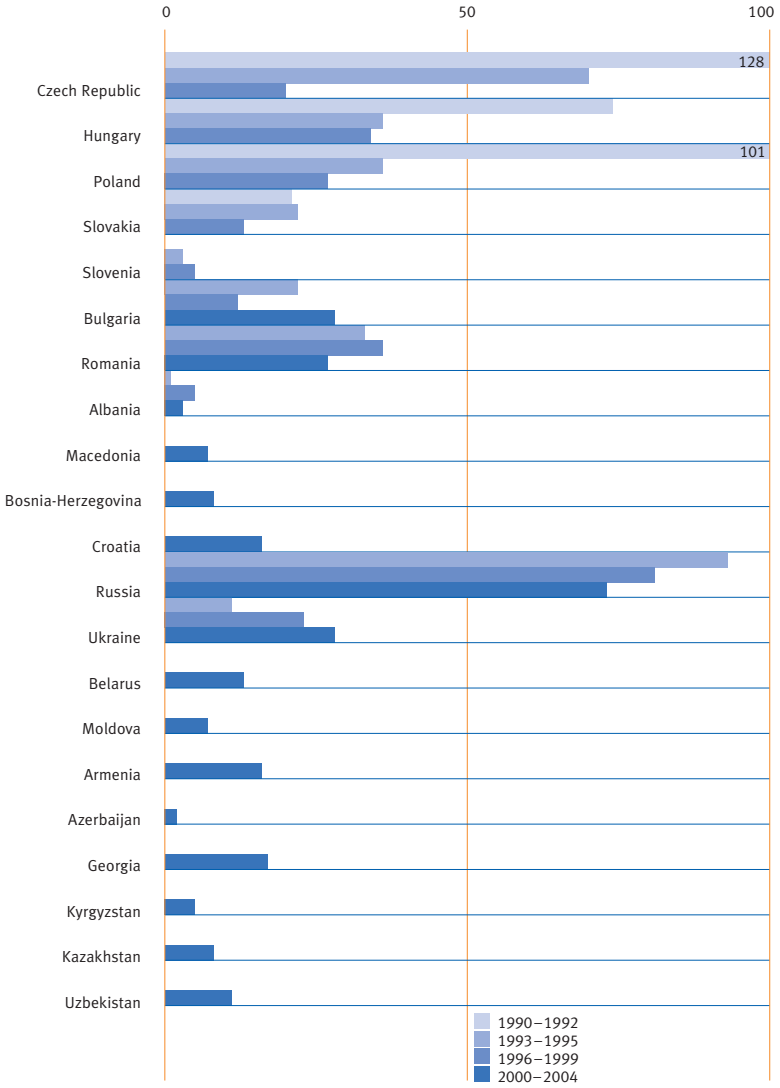
The SCOPES programme has gone through four phases since 1990 and the fifth began at the start of 2005. The table below shows the funds invested and the activities supported by phase. These measures primarily involved contributions to Eastern European research groups and scientific institutions. In addition, a large number of individuals received support in the form of Conference Grants or short visits to Switzerland (until 1995). From 1996 onwards the available funds were concentrated on fewer, but financially better endowed research projects, and the programme was geared more heavily towards institutions.

The countries that qualified for each phase were determined by the Swiss government's Eastern European aid policy at the time. Whereas only Poland, Slovakia, the Czech Republic and Hungary took part in the first phase, sixteen countries are participating in the current phase. The figure on the right side shows the number of participations in *Short-term Fellowships, Joint Research Projects* and *Institutional Partnerships* per country and programme phase.

Budget and activities

Phase	Swiss francs	Supported activities
1990–1992	3.8 million	Joint Research Projects, Short-term Fellowships, Conference Grants
1993–1995	4.8 million	Joint Research Projects, Short-term Fellowships, Conference Grants
1996–1999	11 million	Joint Research Projects, Institutional Partnerships, Conference Grants
2000–2004	14 million	Joint Research Projects, Institutional Partnerships, Conference Grants, Preparatory Grants, Valorisation Grants

Number of participations per country



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