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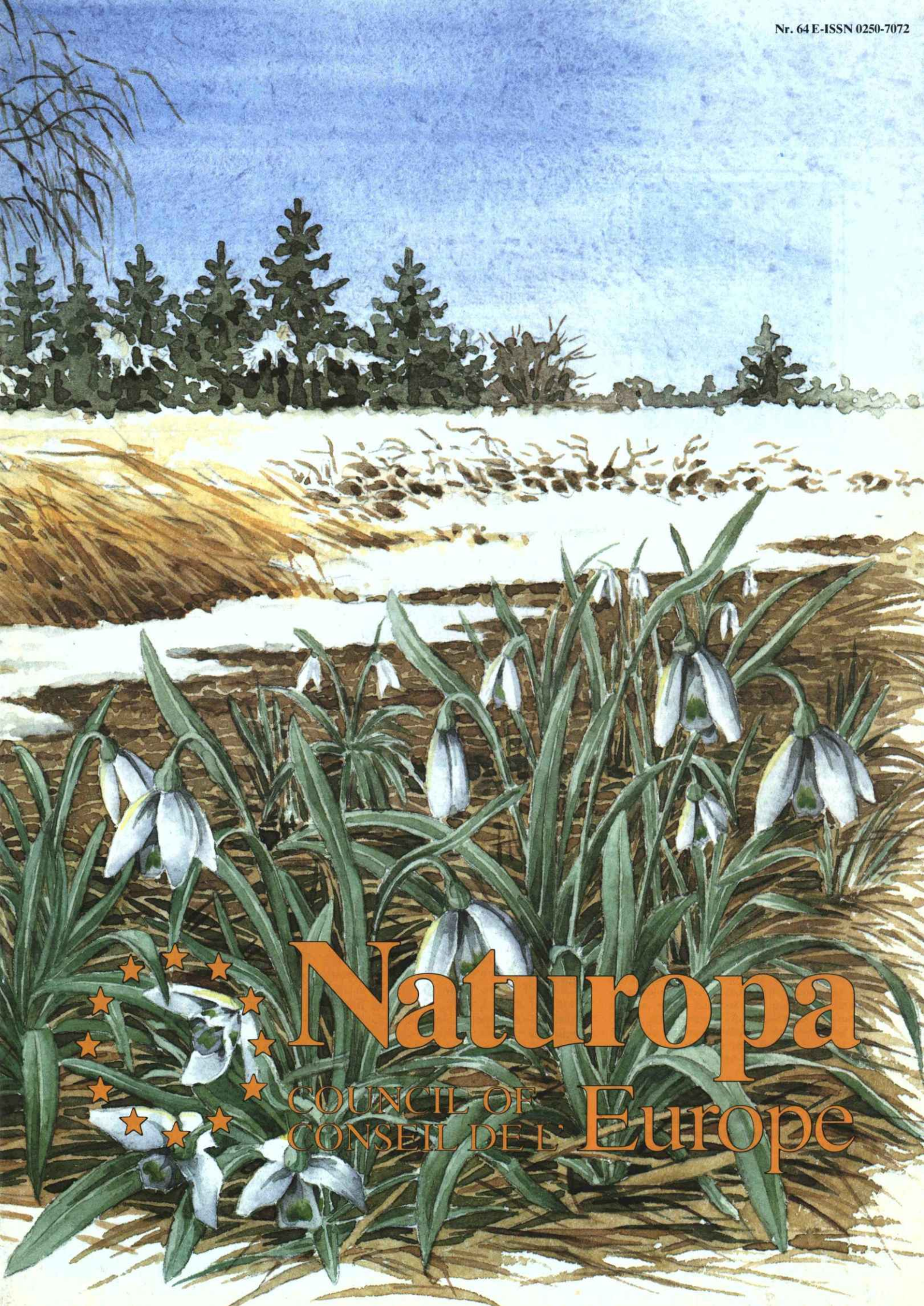

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Snowdrops and cranes

Amidst the near cacophony of voices of alarm about the environment, all more than justified, a new sound of hope is rising above the human conflicts – of which we have had more than enough.

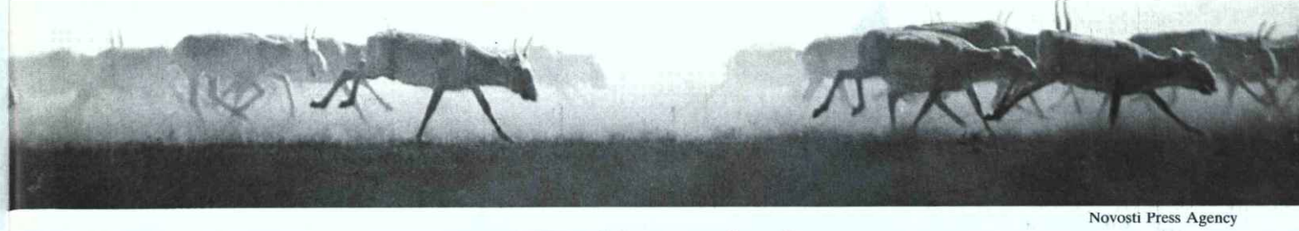
This is the reaching out, after decades of mistrust, of East towards West and vice versa, in an understanding of the fact that our environment can no longer sustain and absorb the punishment we are inflicting upon it: our environment, wildlife's environment.

Hunters and naturalists at first, then scientists, now the world's leaders point to our world's fatigue and exhaustion. Will this now bring about the change, the about-face in our attitude towards "life" which must come, and soon?

In the following pages, we show Europe's environment as a whole, as one problem to be solved by us, Europeans. The problems are of course too numerous, too immense, for one single issue of Naturopa, reason why only a few major themes have been selected, as both the tip and the bottom line of the iceberg.

Naturopa 65 will be dedicated to soil, the priority theme of the Sixth European Ministerial Conference on the Environment, to be held in Brussels in October. Naturopa 66 will bring Europe's freshwater fish species to the surface, this being the theme of a campaign of the Centre Naturopa on an often unknown aspect of our environment: fish and their habitat. ■

H. H. H.



Novosti Press Agency

Editorial

Today, we are witnessing the emergence of a united world, a world constituting a whole and comprising a global system of civilisations, interlinked and interacting through countless channels.

Humanity's living conditions have changed greatly, as have humanity's problems and development trends. It is precisely these problems and trends which seem to be uniting our world to form a single whole. The danger of nuclear war is receding, I hope, and environmental problems are becoming the main survival issue. These problems are the product of the technocratic outlook, which measures progress in millions of tons of metal, of cubic metres of gas, of barrels of oil, of kilowatts. The barbarous wasting of resources, which belong to our children as well, used to be justified by the anthropocentric slogan: "Everything for man, everything for his welfare, everything for his sake…", under which our country lived for many years.

We must not forget that the biosphere is the source and first condition of life on earth. Humanity is only a part, albeit an enormous part, of the biosphere. Its mineral and renewable resources are both limited. And so demographic and industrial growth must be limited as well.

The technosphere which we have created now threatens the whole world's survival. World discord and persistant discrepancies between the levels of development and interests of different countries add to the danger.

The biosphere is made up of ecosystems. The protection and maintenance of biological diversity are vital to the stability of these ecosystems and therefore of the whole biosphere.

The problems caused by swift deterioration of the environment, the disintegration of ecosystems and the disappearance of their constituent species no longer stop at national borders. Many people now realise this, and also realise that we cannot survive alone. Only by combining our efforts can we preserve the biosphere.

All of this concerns humanity as a whole, but it particularly concerns Europe for three reasons: because of Europe's historic responsibility, because the problems are pressing and action is urgently needed, and because Europe has certain facilities.

That brings us back to the idea of an integrated Europe, of a "common home" made up of indissociable components. Ecology is one of the priority elements in the European process, and I consider that its development must be particularly swift.

Environmental conservation and ecological security are one of the priorities of the Soviet Union's foreign policy.

Ecological initiatives recently launched by the USSR in Europe include proposals for a long-term continental ecological programme, for an ecological first aid centre or agency with monitoring and warning systems, for the opening up of national territories to mutual environmental inspection, for a European ecological research institute, for technology aimed at preserving the environment and economising on resources, and for other measures.

The Soviet Union's basic assumption is that effective international co-operation in the environmental field demands greater participation by states in international agreements and conventions on nature conservation, and strict compliance with these texts by all the members of the world community.

One must, of course, begin at home. How can the Soviet Union, while asserting its commitment to the cause of environmental protection, have remained aloof from a whole series of important international agreements and programmes? It is difficult to find a valid explanation today. The reasons are multiple: financial problems, inertia, and even an unjustified fear of "giving too much away". Now that we have set our sights on greater openness in international affairs, the time has come to correct our mistakes.

As Mikhail Gorbachev said in London in April 1989, the USSR intends to act, in the ecological field, in strict compliance with international agreements and programmes, and will soon be acceding to those which it has not yet signed.

A series of environmental measures were proposed in Mikhail Gorbachev's speech on 19 January 1990 at the Moscow Global Forum on environment and development for survival. I would

emphasise that the Soviet leader's speech was centred on the problems of the biosphere.

In pursuance of the agreements specified in the final document of the Vienna meeting of the Conference on Security and Co-operation in Europe, the Soviet Union has made progress in the field of conservation, rehabilitation and improvement of the environment.

The discharge of sulphur compounds has already decreased by two million tons throughout the country, and a further considerable reduction is planned. Steps have been taken to restrict the discharge of nitric oxide, and the list of controllable air pollutants is being constantly extended. The USSR is endeavouring to apply the provisions of the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that deplete the Ozone Layer.

Our country attaches great importance to protecting and improving the quality of fresh water, and to reducing marine and coastal pollution and pollution of international rivers and lakes, and is playing an active part in solving such regional problems as protection of the Baltic, the Danube, the Tisza and other transfrontier rivers and water systems against pollution.

Soviet experts are helping to draft a convention on protection of the Black Sea. However, the problems of the Black Sea cannot be solved without the participation of all the countries through which the Danube flows, just as those of the Mediterranean cannot be solved without the participation of the countries on the Black Sea. This point was made by Mikhail Gorbachev in his speech on 19 January 1990. We always come back, in other words, to the need for increased international co-operation to preserve the biosphere, and mankind as a part of the biosphere.

The Soviet Union is working all the time to give protection of the environment a better basis in law. A USSR law on environmental protection is currently being studied. A long-term state programme for the conservation of nature and the rational use of natural resources is being planned for the 13th Five-Year Plan and for the period up to the year 2005. This takes account of the principles and reference points laid down in the regional strategy on environmental protection and rational use of natural resources in EEC member countries covering the period up to the year 2000 and beyond and in the report of the International Committee for Conservation of the Environment and Development, and other international agreements signed by our country.

We favour ecological glasnost. The USSR State Committee for the Environment published its first report on the state of the natural environment in 1988. It will soon be starting work on a similar report for 1989. A training programme on the environment and the rational use of natural resources is already being run for administrations.

The Soviet Union played an active part in preparing and organising the Conference on the Environment, which was held in Sofia from 16 October to 3 November 1989, in accordance with the final document of the Vienna meeting of the Conference on Security and Co-operation in Europe (CSCE). The Sofia meeting was a fruitful one, and formed part of the Helsinki process. It raised specific ecological issues in political terms. For the first time in the whole history of the Helsinki process, the problems of environmental protection were discussed at a special European meeting. The agreements embodied in the final document, drafted by 34 delegations from participating states, provide a sound basis for appropriate measures in individual countries and for concerted multilateral action. The document could not be adopted in Sofia itself because of the obstructive attitude of the Romanian delegation, which had not been authorised to sign by its government. The totalitarian regime in Romania has now collapsed, however, and it is to be hoped that the text drafted in Sofia will eventually become the final document of the meeting.

In conclusion, I would like to thank the Centre Naturopa for inviting me to contribute these few words. I believe that the Council of Europe can play an unprecedented role in establishing and developing contacts between East and West in the environmental field. I also think that the granting of special guest status to the USSR by the Council of Europe will open the way to closer contacts with the Centre Naturopa itself. ■

Prof. Nikolai Vorontsov

President of the USSR State Committee for the Environment.

AFP Photo

The Council of Europe's role

"Establishing the right to a healthy environment"

Ferdinando Albanese

With the appointment in 1962 of the Committee of Experts for the Conservation of Nature and Landscape, the Council of Europe became one of the first organisations to make conservation a truly international issue. Since that date, safeguarding the environment has been one of the major concerns of Europe's populations, a problem of society in the true sense.

For the past 28 years the Council of Europe has been helping to clarify the problems and promote solutions. In framing the Convention on the Conservation of European Wildlife and Natural Habitats, it provided conservation with principles and a structure, which have greatly assisted efforts to protect threatened species of flora and fauna and conserve natural habitats; the European diploma and the European network of biogenetic reserves have proved to be very effective aids to conservation and management in protected areas; and through the Centre Naturopa and its publications, it has endeavoured to alert the authorities concerned to the need for protection and management measures, and win their support.

By now, concern about the environment and its conservation goes far beyond the frontiers of the member States of the Council of Europe and calls for co-operation on the part of the entire international community. New measures are continually being put in hand at local, regional, national and international level; a certain amount of duplication of effort is apparent among the traditional international organisations, and new co-operation institutions are being set up. In this context, what is the way forward for the Council of Europe?

Target activities

In my opinion, our Organisation can and must continue to make a substantial contribution to the conservation of the environment, but should concentrate on those sectors in which no other international organisations are particularly active, or where the principles it upholds, its experience and working methods enable it to make its own specific mark.

Firstly, the Council of Europe can help to secure the agreement of governments to establish new Europe-wide objectives for the protection of the environment, taking account of the most recent developments in our society. The European conservation strategy now in preparation is intended for this purpose. Where appropriate, the Council of Europe could also provide opportunities for its member States to exchange information, compare their views, and adopt a common position among with regard to problems under consideration within other international, and notably worldwide, organisations. Helping Europe to speak with one voice is perfectly in keeping with the aim enshrined in Article 1 of our Organisation's Statute, which is to achieve a greater unity between its members.

Secondly, in addition to its traditional activities in the field of nature conservation, there are a number of problems that the Council of Europe could address which are either new or of continuing importance and acuteness, such as the ecological impact of the new biotechnologies, environmental husbandry in the rural community or the protection of soil resources.

Jurisdiction of the environment

It is my personal view that the Council of Europe should involve itself more fully with the legal problems posed by conservation, as these are areas where its experience in the harmonising of legislation is unmatched throughout the world. Our Organisation has already made a start by adopting texts on the right to information and the right to participate in decision-making on administrative matters. Further clarification of these texts is now necessary to make them applicable to the environment. Work is also in progress to prepare an instrument on compensation for damage caused to the environment.

But our Organisation's true vocation is, it seems to me, to help bring about the situation where the right to a healthy environment is recognised as an individual right with an appropriate international instrument to safeguard it.

In this way, the Council of Europe will be responding in the best way possible to the new guidelines set by the Committee of Ministers in the Declaration of 5 May 1989 on the future role of the Council of Europe in European construction. This Declaration indicates three priority lines of action: safeguarding and reinforcing pluralist democracy and human rights, fostering awareness of European cultural identity, and seeking common responses to challenges confronting modern European society. In working to preserve the environment, the Council of Europe directs its course towards all three of these goals; for conservation is destined to become at one and the same time a fundamental feature of our culture, a response to society's need for the best possible quality of life and a means of achieving what is being seen more and more as a human right in the true sense, namely the right to a healthy environment. ■

Dr. F. Albanese
Director of Environment and Local Authorities
Council of Europe

East European Programme

Zbigniew Karpowicz
Elizabeth Hopkins

In the autumn of 1987, IUCN East European members were asked to advise the Union on its future activities in their region. The options were continuation of the dispersed pattern then existing, or an integrated programme co-ordinated by a single management entity. The latter was chosen and the East European Programme was launched at the IUCN General Assembly in February 1988 with financial support from the Rockefeller Brothers Fund.

Is East Europe a legitimate ecological entity?

This is debatable, as is the definition of East Europe itself. The main ecological divisions of Europe tend to go north-south as this issue of Naturopa shows and indeed the ultimate aim of all environmental organisations must be a Europe-wide effort for conservation of nature.

However, in October 1987, before the re-emergence of "Solidarity" and the breach in the Berlin wall, before the crowds gathered in Wenceslas Square and Eco-glasnost marched in Sofia, the system in Eastern Europe and the USSR required special methods of co-operation. For example, although IUCN's singular role is to bring together governments and independent citizens' groups, this was not possible in Eastern Europe until very recently. IUCN's members were government environment agencies, ministries of the environment and scientific institutes.

The EEP is now working with independent citizens' groups in Hungary and Poland and discussions have been held with NGOs in the USSR, Bulgaria and the German Democratic Republic. We expect to have new NGO members soon in spite of some difficulties which are now more of a financial and organisational nature than political.

The moment of decision

The environmental situation does not change when a wall is breached or a leader falls. The situation in some parts of Eastern Europe and the European USSR can accurately be described as disastrous. Everyone is probably familiar with the shrinkage of the Aral Sea and the transformation of the surrounding area into a dust bowl; of the need to clean the waters of the Vistula even for industrial use; of the dead forests in the German Democratic Republic and Kola Peninsular, and of the heavy pollution loads flowing into the Baltic and Black Seas.

There have been some harsh judgements about the causes of the situation: ecological ignorance – adventurism – immorality – but the solutions clearly lie in political, social and economic changes. If such changes are now occurring, it is essential that they reflect an ecological awareness.

Information is a key component, at the disposal of both citizens and government, in the drive to change policies. The role of IUCN is to maintain the focus of change on the environment and to help to construct a new ecological attitude.

The parlous economic state of the countries of the region requires a more creative and innovative approach than in Western countries which are, for the most part, ahead in environmental protection and have the economic wherewithal to deal with prevention and rehabilitation. The East requires technical resources and, in some areas, technical know-how. Its official institutions need strengthening and restructuring; Eastern European citizens need time and assistance to organise themselves as environmental watch-dogs, and to establish channels of communication with each other and with their governments.

As a result of a sustained dialogue with its partners and continuous monitoring of the situation in Eastern Europe, the IUCN EEP has been able to achieve an overall and accurate view of developments in a seemingly chaotic epoch. It is now, for example, in the position of being able to capitalise on specific bilateral interests to carry forward unique projects.

The EEP will thus continue to focus on Eastern Europe and adapt Programme management to the changing situation. However, from the outset, the Programme has sought to increase and strengthen co-operation between the different parts of Europe and all its projects explicitly make the link.

Addressing the priorities

The foregoing has described the rationale for a programme in the region and management responses to a rapidly changing situation. What is EEP actually doing? What does it hope to do in the future?

The EEP is a long-term joint venture in environmental protection and rehabilitation. That is not an idle boast. Representatives of each of IUCN's partner countries in the region, making up the East European Task Force, identified priorities in their own countries, which are now incorporated as components and projects in the Programme. There is not enough space here to describe them all, but we shall look at some of the ways in which the issues identified at the beginning of this article are being approached.

Air, water and soil pollution have been identified as the major environmental scourge of the region. IUCN EEP has suggested a framework by which sovereign debt may be exchanged for clean air and water technology. IUCN's role in this innovative approach is to alert governments in East and West of the possibilities and then help identify the most environmentally damaging sources of pollution and match that information with the technology required, as identified by the relevant governments. The financial experts then take over.

W. Lapinski

The planet

Francesco di Castri

Now that the 1990s have begun, we may well feel that we are facing an unpredictable future. A number of major trends could, however, give us some idea about the future of Europe's environments, from the Atlantic to the Urals.

We may expect Europe to be "greener", with more extensive woodland areas, and national parks that really serve their purpose; where land taken out of agriculture is used for a combination of farming, forestry and grazing, with farmers assuming the principal role as protectors of a harmonious "man-made" environment; and where smaller acreages are given over to intensive farming (in order to avoid the surpluses that weigh so heavily upon our agricultural policies). For Europe as a whole, this would mean fewer fertilisers, pesticides and weedkillers and therefore less pollution of the surface waters and ground water. To ward off the greenhouse effect, ozone depletion and acid rain, trace gas emissions would also have to be significantly reduced.

But how can this design be made to fit into the physical context of the planet Earth, into the worldwide tendencies and interdependencies, into the external forces that caused the North/South split, where divergencies are becoming accentuated and could be the cause of an agonising break-up in the 1990s? Because of climatic changes induced by human intervention, we shall be unable to avoid long periods of drought in Europe, huge forest fires and faster soil erosion in the South and probably flood disasters in the North. The present ecosystems will shift and become fragmented, and sea levels will rise.

But the most catastrophic and most immediate ecological changes in Europe and the world could well be those resulting from economic disorders and worldwide geopolitical fractures. Do we seriously imagine that, in 30 years or so, the population of the underdeveloped world, more than 80% of the whole, will be content to watch the remainder, a mere 20%, taking land out of agriculture and reducing the surpluses of certain products, and not react vigorously, possibly resorting to uncontrollable mass migration in extreme cases?

The conclusion must be that it is essential to act quickly to save the European environment, but Europe's future environmental scenarios will depend still more (probably about 60%) on what happens in the rest of the world. Europe will have to throw its whole weight into a campaign for the adoption and application of wide-ranging international conventions (on climatic changes in the world, biological diversity, etc.) binding on all the countries of the world, and for the establishment of a form of sustainable development combined with a renewal of resources both in Europe and in the third world. ■

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Another project under the pollution component will examine the likely environmental impact of intensive agriculture. As East European countries try to raise the competitiveness of their agricultural sector, they will benefit from the experience of EC countries which have recognised the dangers of water and soil pollution from fertilisers and pesticides and from the physical transformation of habitat. Thus the main mechanism applied in the project is exchange of experience with EC experts and policy-makers.

Another initiative is an international meeting in Czechoslovakia in June 1990, to examine the management of protected areas under emissions impact.

Integrating environment in planning

Drawing on the principles of the World Conservation Strategy, IUCN acts on the premise that environment and economic development are two sides of the same coin. Task Force recommendations to find mechanisms for integrating environment into government planning thus find a strong echo, and a proposal to address the issue has been developed. Institutional restructuring and strengthening will be in the forefront of the project's analysis.

A sub-regional conservation strategy for the Danube is also being proposed as a complement to the work being done by the UN/ECE on transboundary water issues which has not integrated nature conservation strategies.

The growth and development of independent and organised citizens' groups are essential for transmitting citizens' concerns about their environment to government and to engendering the realisation, unusual in East European countries, that citizens can shape their own societies. Education of the public and awareness-raising about the environment are also crucial roles for citizen groups.

Apart from making efforts to promote membership of IUCN amongst citizen groups, the EEP is embarking on a number of projects aimed at strengthening NGOs. For example, it is hoped that funds will be obtained to bring a number of activists to Western Europe for three months' hands-on experience in NGOs. The focus will be on management, fund-raising, lobbying and networking. On their return to their own countries, the individuals will be supported financially for nine months so that they have a chance to apply what they have learned and raise funds for their future support.

Training

Although there are eminent scientists and excellent academic institutes in the environmental field in East Europe, there are some gaps. One of those is in database management. The EEP has received a Czechoslovak scientist at the World Conservation Monitoring Centre for database training and an expert from one of IUCN's member organisations in the UK, the Nature Conservancy Council, has made a return visit. The next exchanges will be with Poland and Bulgaria. Most of the projects in the programme incorporate a training element. The agriculture project, for example, envisages training in environmentally sensitive farming techniques.

Achievements

Although the Programme is at the beginning of the initial three-year phase, a number of products and other achievements have been possible.

National environmental status reports have been produced under the supervision of Task Force representatives. Three of these will be published early in 1990 (Czechoslovakia, Hungary and Poland) and the rest will follow later in the year. Training exchanges have been mentioned.

A series of other reports have been produced including one on identification of protected areas in Poland, Hungary and Czechoslovakia affected by aerial pollution (incorporating data from IIASA); a draft directory of protected areas in Eastern Europe and the USSR; constantly updated summaries of the environmental situation in all Eastern European countries and the USSR; a database of environmental expertise in the region, and short reports on specific issues such as Lake Baikal and the Danube. The Programme has recently been contracted by the World Bank to produce a background report on environmental issues in Hungary.

The EEP is actively advising the Polish government on environmental issues in relation to agreements and negotiations with Western European governments and the EC. The Programme was honoured to be invited to participate at the recent meeting on the environment of the Commission for Security and Cooperation in Europe.

The future

There is already talk of a three-tier European Community incorporating EFTA and the countries of Central and Eastern Europe. The IUCN EEP is preparing for the independent overall monitoring and action that will be required by linking East and West in all its projects and at the same time, assisting Eastern European countries to achieve environmental parity with Western European countries.

Although the EEP is now recognised as a major source of information, and forum for action, on environmental issues in Eastern Europe, its funding situation does not allow expansion to its full potential. The Programme staff will continue to appeal to Western governments and foundations for the support needed to bring about environmental improvement so that a healthy environment can be described as "common" to the European Home. ■

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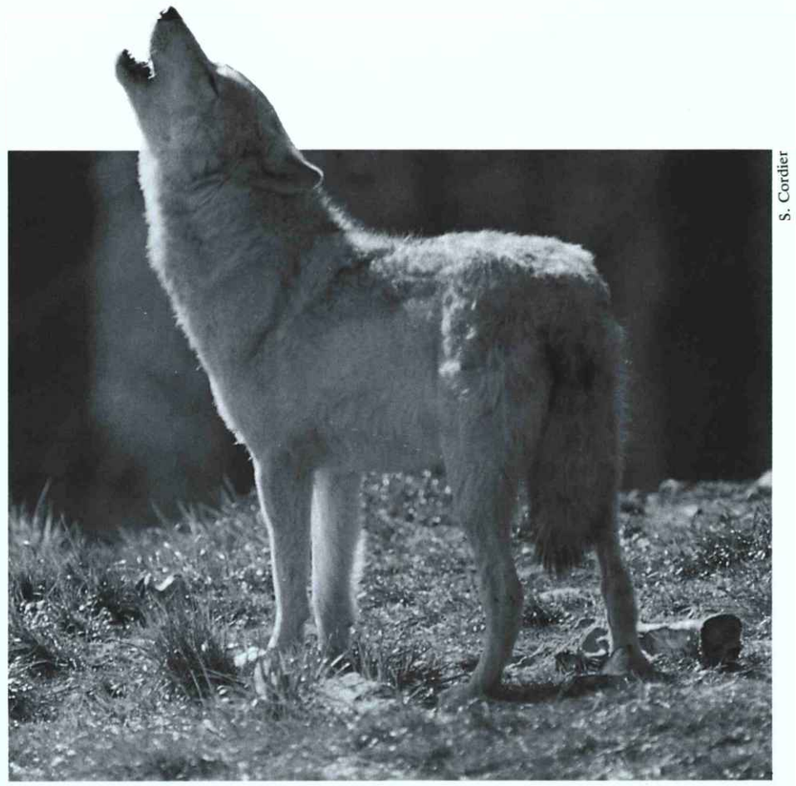
Cry wolf!

Europe's fauna

Luigi Boitani



S. Cordier

Even today, not far from Rome, and scarcely 20 or 30 km from the Coliseum, a few wild wolves can still be found roaming free.

There are between 250 and 300 left in the whole of Italy, and their numbers, which fell as low as 100 in the early 1970s, are now on the increase. The extraordinary fact that a large carnivore such as the wolf has been able to survive in an overpopulated country like Italy, where the average density of population exceeds 190/km^2, is the result of a whole series of ecological, historical and cultural factors that have characterised man's relationship with nature in Italy for the past 2,000 years. Unlike much of Europe, Italy has always had an ambivalent attitude towards the wolf, one of both aversion and respect, with the result that the species has never been relentlessly hunted with a view to its extermination.

Background

The historical and ecological explanations for this behaviour are to be found in the origins of the main forms of farming practised on the peninsula: sedentary agriculture for the most part, but also livestock farming. The crop-growing farmers have accustomed themselves to living alongside wolves and have been able to tolerate them; the stock-breeders, however, boldly attacked the species, which was capable of inflicting considerable losses on their herds.

In Central Europe, where livestock farming is the most common form of land use, the wolf has always been regarded as undesirable. In Scandinavian mythology, the legendary wolf Fenrir even kills Odin, father of all the gods: the wolf could hardly have been portrayed in a worse light! Extermination of wolves in Europe goes back a very long way. In many countries in medieval times, wolf-hunts were organised directly by the state and Charlemagne is said to have instituted the "louvetiers", the masters of the wolf hunt. The 17th century saw the start of the widespread systematic killing of wolves all over Europe. The species disappeared first of all from England then Scotland, the Netherlands, Germany, Switzerland, Austria and, lastly, France.

Despite the vast forests there, the wolf experienced a similar fate in Scandinavia and was exterminated in Norway and Sweden. A few still remain in Finland but only on account of a small, yet steady influx of wolves from the Soviet Union. A small pack of wolves recently re-emerged in a border area between Norway and Sweden. First sightings were of a pair of wolves which then bred; some of the animals subsequently scattered whereas others were killed but the small pack continues to survive, studied and closely monitored by biologists from both countries, despite the constant pressure from livestock farmers, hunters and the press. The wolf is therefore only to be found in numbers in Italy, Spain, Portugal and Greece. In Greece, the small wolf population remains in contact with the larger populations in the Balkans and Eastern Europe, but in Italy and the Iberian Peninsula the wolf is cut off from all contact with the other populations. This isolation already dates back a hundred years and explains the originality of these two populations which has earned them the scientific status of subspecies. It is clear that the Italian and Iberian wolves have adapted their behaviour and their habits to their environments, which differ greatly from the species' original habitat. Whereas wolves in North America and Central Asia prey on large herbivores, in Italy they have adjusted to a much more varied diet of small rodents, fruit and plants, the occasional hare, and, above all, food scraps and some domestic animals, while in Spain, they attack small wild boar and game, though their staple diet still often consists of scraps.

Compensation

Of course, the most spectacular feature of the wolf's behaviour is its attacks on domestic livestock. An entire flock of 200 or 300 sheep may be wiped out within the space of a few hours, resulting in serious financial losses for the shepherds. Specifically in order to tackle this situation, several regional governments in Italy have adopted a system of compensation for losses caused by wolves. In principle, the relevant legislation is extremely strict because it is designed to spread the financial

The bear population in Greece is still a viable one. The association "Friends of the Greek Bear" is working to ensure its protection.

burden entailed by the presence of wolves over the whole of society, thus relieving the livestock farmers. However, the strict application of the law is difficult to achieve as it may cover other causes of death. In Italy, for example, stray and feral dogs live in the wild and also scavenge for food, particularly butchers' scraps. The dogs wreak havoc amongst stocks of domestic animals, causing enormous damage, or attack the herds of grazing animals, whether in enclosures or roaming free. This damage is reported as having been caused by wolves in order to receive compensation, and the staff responsible for checking the claims are not always competent to recognise the offender. Despite these problems, the compensation laws play an essential role and should become national, applicable throughout the territory concerned.

Genetic threat

The existence of feral dogs (dogs which have returned to the wild) poses other problems for the wolf population, particularly the possibility of cross-breeding. The dog and the wolf belong to the same biological species and mutual fertilisation is possible. Although as a rule there is an impassable behavioural threshold, we have personally recorded several cases of mating between dogs and wolves in Central Italy. The numerical ratio is naturally crucial: if mating were rare and isolated, it would be harmless, whereas if it were a frequent occurrence, the wolf would risk rapid extinction. There have been stray dogs throughout the Mediterranean basin for a very long time. Zoological publications from the last century describe the notorious "dogs of Constantinople" as a separate species: the climate and available resources meant that ownerless dogs were able to survive all year round. There are presently an estimated 200,000 stray dogs in Italy and 80,000 feral dogs, figures vastly superior to the few hundred surviving wolves. Paradoxically, the problem of stray and feral dogs is one of the most difficult to resolve, because animal and dog protection bodies act to prevent their capture and slaughter.

Trial and error

The wolf situation in Italy and experiments carried out in the country to protect the species have for many years been regarded as a pilot project by the World Conservation Union, and Spain and Portugal, or other European countries wishing to launch a wolf protection campaign, can now study the Italian successes and failures. The project launched in 1987 has succeeded in doubling the number of wolves in Italy and has almost doubled their available habitat. The success is remarkable, but the danger is not yet over. We can certainly not regard a population of only a few hundred animals as safe, especially when they are distributed over a series of fragmented areas along the whole length of the Apennine range. Epizootic diseases such as rabies, as well as accidents, or clashes with dogs could well render them extinct very rapidly. That is why the protection project in Italy has entered its final phase, whereby wolves are being bred in captivity for their own protection. A small number of wolves will be bred with a view to safeguarding at least 95% of their genetic make-up for between 100 and 200 years. It is a long-term project that only a state can undertake. In Italy it is the Forestry Commission and its "Azienda di popoli" that are providing the premises, equipment and staff required to carry out the project. The fact that we are keeping the species in captivity does not mean we are no longer protecting the animals in the wild, but that we are giving ourselves a possible means of controlling their numbers. A reserve of wolves in captivity may be crucial for any future action, such as repopulation or reintroduction of the species.

European strategy

The other Mediterranean countries might consider a similar policy. At the Council of Europe, in the context of the Bern Convention, a group of experts on the wolf, representing all the member states, has for the first time pooled experience and adopted a common strategy. It is clear that it will not be possible to protect the wolf for long in Europe without a global strategy encompassing the entire continent. Otherwise, the future will be precarious for the small remnant populations which will ever verge on permanent extinction. The link with East European countries is therefore vital because in some of these countries the situation of the wolf populations is good, for example in Poland, where the species is regarded as *ferae naturae*, or Yugoslavia. However, there are also smaller wolf populations in Czechoslovakia, Romania and Bulgaria. The presence of the species goes hand in hand with a greater diversity of fauna in general in this area and perhaps also with the better health of the populations found there. Although no European nation can boast a larger deer population than Germany, there are other countries where species are more numerous and more typical.

Diversity in the South

The greatest diversity is to be found in the Mediterranean countries, but exploitation of fauna is least severe in East European countries. The following examples hold equally true for other species. The brown bear is still in existence in the Iberian Peninsula, Italy and the Balkans, but disappeared from Western Europe long ago. An assessment of mammals in Europe might define Central Europe as the area of large ungulates, with its many populations of red deer, roe-deer and wild boar and, in the Alps chamois and ibex. These species are less well represented in the Mediterranean countries, where, on the other hand, there is a greater diversity of species. For example, the porcupine, jackal, and genet are all to be found as far north as the Mediterranean countries. As a whole, the mammal population in Europe is stable, because of the stability of most habitats. The other hand, the mammal population in Italy has swelled considerably because farmland, especially mountainous terrain and grazing grounds, have all been abandoned. Vast areas that were used for pasture have been taken over by forests. Admittedly, statistics tell us that the number of domestic animals has increased but the most common form of stock farming nowadays involves keeping the animals in sheds all year round rather than turning them out to grass. When ecological rules change for man, they also change for wild animals. The wolf has nothing to fear from these changes, having lived alongside man for thousands of years and having adapted his diet from feeding on large wild herbivores, to sheep out to graze, then to scraps scavenged from refuse heaps, and now to horses let loose to feed in the Appenine mountains. The greatest danger for the wolf is the bad reputation given him by man. We must concentrate our efforts on this reputation, destroy it and replace it with the true natural history of the wolf. ■

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A practical example

Work on the atlas of reptiles and amphibians of Europe began in 1983 at the instigation of the Societas Europea Herpetologica. The cartographic data input is processed by the Fauna and Flora Secretariat (Natural History Museum, Paris). The inventory uses squares measuring 50 × 50 km (U.T.M. grid).

The 25 participating countries have already provided 40,000 items of information and provisional maps are produced regularly.

The final publication date is 1992.

For further information, please write to:

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Acting on its own initiative, the Fauna and Flora Secretariat has begun to compile an atlas of the mammals of Europe on the same model as the map of reptiles and amphibians. A Societas Europea Mammalogica was created for the purpose in June 1988. There are 15 participating countries at present (including the USSR, Czechoslovakia, the German Democratic Republic, Romania and Poland). However, the work of data collection and cartography has only just started.

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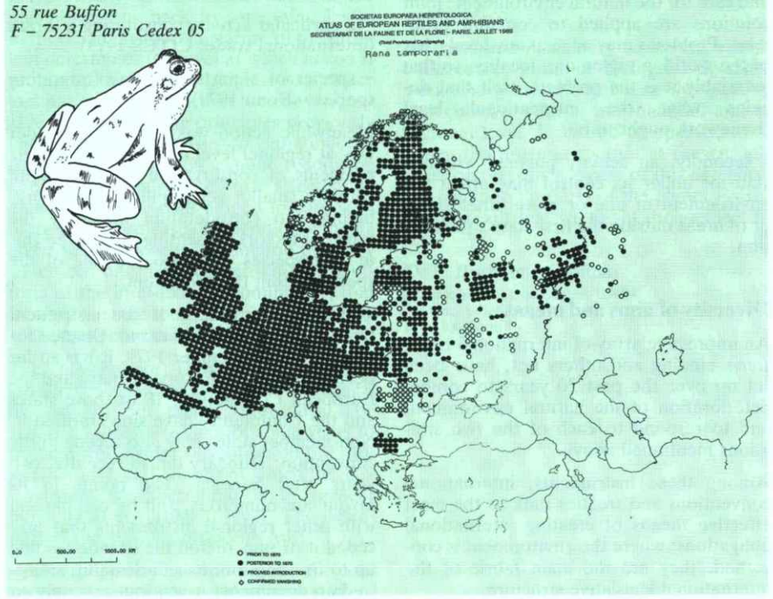

The legal armoury

Françoise Burhenne-Guilmin

As the World Conservation Strategy reminded us, there are limits to what a country can do on its own to safeguard its natural heritage: those limits are its frontiers, which nature does not recognise.

Undeniably, therefore, international law has an important role in conservation: inter-state machinery and international instruments provide the means, facilitate enforcement and create an obligation.

There are two aspects to this role:

– often it is a case of a number of states agreeing to adopt certain rules of conduct in the name of good resource management and care for the natural environment: joint solutions are applied to common problems. Problems may arise at any level, that of the world, a region or a locality, so that invariably it is the problem itself that decides what the international legal framework ought to be;

– secondly, an activity pursued within a state or under its control may affect the environment of one or more other states or of areas outside the first state's jurisdiction.

Diversity of aims and means

An impressive array of international rules, some binding and others not, have been set up over the past 20 years to combat deterioration of the natural environment and to respond to each of the two situations mentioned above.

Among these instruments, international conventions and treaties rank as the most effective means of creating international obligations; where the environment is concerned, they are the main fabric of the international legislative structure.

What form does this structure take in Europe at present?

A proper description would start with living matter as the essential component of the natural world, and the species as the "building blocks" of the biosphere.

All the treaties signed in the first half of this century are in fact concerned with protecting species against over-exploitation or the threat of extinction. The emphasis is regulations governing the taking of species, and the obligations take little or no account of relationships between those species and the ecosystems of which they are a part.

This phase was followed by a series of worldwide initiatives in which it was acknowledged for the first time that specific cases called for international measures; action was therefore selective and covered:

– a type of habitat under threat (Ramsar, 1971)

– sites and habitats of exceptional value (World Heritage, 1972)

– a particular activity constituting a threat (international trade: CITES 1973)

– species of a particular type (migratory species – Bonn 1979).

Meanwhile action was also getting under way at regional level in a bid to tackle the problems of conservation in more depth within a smaller geographical framework, taking into consideration not only the range of factors presenting a threat to this or that species, but also the role of the species within the ecosystem.

The Bern Convention is the instrument that best represents this trend. Opened for signature in September 1979, it has so far been signed by 20 European states and the European Community; 18 of those states and the Community have since ratified it. Non-member states may also accede to the convention: Hungary did so recently, two years after Senegal. The points in its favour are numerous, and by comparison with other regional instruments that preceded it or punctuated the decade leading up to its adoption, it is undeniably an up-to-date document: it sets out not only to provide strict protection for species whose status is unsatisfactory as far as conservation is concerned, but also to confer an appropriate degree of protection upon the large majority of European species occurring in the wild.

For this, the convention emphasises several key approaches: on the one hand, co-operation between the Parties, and on the other, the conservation of habitats; the convention also emphasises the need for Contracting Parties to have due regard for ecological considerations in their planning and development policies.

Need for follow-up

Such a programme cannot be put into effect without machinery for regular consultation and co-ordination. The Bern Convention provides for such machinery in the form of the Standing Committee which meets regularly; secretarial services are provided by the Council of Europe, which is known to have had a pioneering role in nature conservation in Europe and was the first European organisation to place nature, natural resources and – wherever necessary – conservation of the natural environment high on its list of priorities.

The Standing Committee of the Bern Convention has an imposing burden of responsibility. For a convention is an instrument that operates satisfactorily only if the signatory states give it their full support. In the case of the Bern Convention that support takes the form of a monitoring exercise on the part of the Standing Committee, mainly with regard to the provisions on natural habitats. In its endeavour to base the implementation of these provisions on effective joint action, the Standing Committee gives the convention the dynamic character of an instrument designed, like any other regional convention of this kind, to establish liaison between worldwide agreements and agreements of a sub-regional character such as the Protocol to the Barcelona Convention on Protected Areas in the Mediterranean, concluded in 1982.

To be successful in world-wide and regional action concerned specifically with species and habitats needs the backing of similar efforts to sustain the essential natural processes and keep the ecosystem in a generally sound condition.

A survey of international conventions on the natural environment would be incomplete if it failed to mention developments in the matter of pollution, not least sea and air pollution.

The otter, symbol of the Council of Europe's Bern Convention, is threatened in most of our countries.

A. Pons/BIOS

Air and water

Where the sea is concerned, one can name more than 50 international agreements that have been concluded since 1970. Some are world conventions with the emphasis on particular pollution sources (ships, for instance); then there are the regional conventions dealing first with specific problems such as marine pollution by dumping from ships and aircraft (Oslo, 1972) and from land-based sources (Paris, 1974) and later with all types of pollution, such as the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki, 1974) and the Convention on the Protection of the Mediterranean Sea (Barcelona, 1976).

Meanwhile, negotiations were in progress that were to lead to the conclusion of the Convention of the Law of the Sea at Montego Bay in 1982. Part XII establishes a codified series of rules which most states largely recognise as valid whether or not they are actually applying the convention. These include the obligation upon states to protect and preserve the marine environment, a clause which, however tame it may appear, in fact enshrines the concepts of joint and individual responsibility towards the marine environment in general.

It was only much later that protection of the atmosphere came to be considered as anything but a local problem: not until 1979 was the Geneva Convention on Long-range Transboundary Air Pollution concluded within the framework of the United Nations Economic Commission for Europe. Its entry into force in 1983 was followed by the adoption of Protocols, one on sulphur emissions and their transfrontier effects (1985) and another on nitric oxide emissions (1988).

The movement gathered pace with the conclusion in 1985 of the (worldwide) Convention on the Protection of the Ozone Layer, and its Protocol on CFCs two years later. Negotiations are under way with a view to bringing further measures into the compass of this convention.

The greenhouse effect is the latest phenomenon to command attention, and an outline convention on the subject is currently being negotiated.

Overall view

These developments, which show that the need for action on a world scale is now more readily acknowledged than in the past, brings us back to something I said earlier, namely that the nature of the problem determines the level at which action is required; this idea is gaining acceptance and has exploded much of the conventional legal wisdom. The principles previously laid down in response to situations of transfrontier pollution cannot readily be applied when all states are affected by damage they have all helped to cause. In more and more cases recognition is being given to the concept of common property which can only be safeguarded by the efforts of the international community, that is to say the sum total of all action taken by each state separately.

The atmosphere is a case in point. Another is the capital that the biological diversity of our planet represents. The IUCN has been working for some years to frame a worldwide convention on the subject, an idea and a concept which the UN Environment Programme is at present pursuing at government level. The essentials of the IUCN's proposals are:

– general principles applicable to the conservation of biological diversity as such;

– machinery for preparing a world plan of action;

– the establishment of a funding system in order to have the components of this plan put in place.

International machinery to ensure worldwide conservation of biological diversity would be a useful adjunct to the existing conventions, both at international and at regional level. Increased co-operation between the instruments that at present address one or other aspect of this diversity, the common property of the planet Earth, is one result that we might then expect to see. ■

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Near the Arctic Circle

Vladimir Kaliakine

For most of us, the Arctic is an icy wasteland, the home of polar bears and walruses, where civilisation is only just beginning to make itself felt. However, this impression is a far cry from reality. The Arctic provides us with coal, copper, nickel, fish, and marine animals; ice-breakers guide one ship after another into its seas; airlines from various countries operate over its territory; and the past few decades have seen a dramatic growth in oil production in neighbouring regions.

Subtle interactions

There is a particularly high level of human activity in the Barents and Norwegian Seas, which for the most part do not freeze, on account of the Gulf Stream; strong human presence. In the mid-1970s, fishing catches in the Barents Sea reached 3.2 million tons. Populations of the main species of fish caught for trading (herring, cod, capelin) have not survived this activity and fishing for them has now virtually come to a standstill. It did not take long for the reduction in fish numbers to be reflected in the bird and animal species linked to fish via food chains – the guillemot, ringed seal and Greenland seal. We are not yet able to assess the full extent and consequences of this ecological disaster nor do we know when the wound will heal or even if it can one day heal.

Few studies have been made of the process by which phytoplankton forms in the Arctic seas. It is recognised that its reproduction is closely linked to the zones of upwelling where autotrophs (microscopic algae) receive the mineral substances to be found in the upper layers of the seas. However, the mineral substances are not sufficient for the reproduction of phytoplankton. Birds play a very large part in the circulation of biogenetic substances in the Arctic seas and in preserving their balance. Most of the organic matter birds take from the sea is returned in another form, ready for consumption by plankton which, in turn, becomes food for zooplankton and alevin. Over-fishing thus causes a drop in the number of birds, which leads to reduction in the amount of plankton, which destroys the marine community's life-support system.

I have been working in the Arctic since 1959, when storms along the coast of the island of Vaigach and the Yurski Peninsula used to leave two-metre-high piles of little fish stranded on the shore. Now, however, the sea scarcely gives any fish at all. The Arctic seas are dying, though the extent of this process is still unknown.

In nature, every species has a clearly determined role. In the context of the Arctic's impoverished ecosystems, the disappearance of any species is irreparable: nature is unable to replace the broken link in the chain of functional ties. Our recent ancestors have wiped out the eiderduck, the cormorant, and Steller's sea cow, and whales, walruses, and seals are all threatened with extinction. As far as the 1970s, nearly one million small birds (especially guillemots) died in the floating nets used in the North Atlantic, bringing about considerable changes in the Arctic ecosystems.

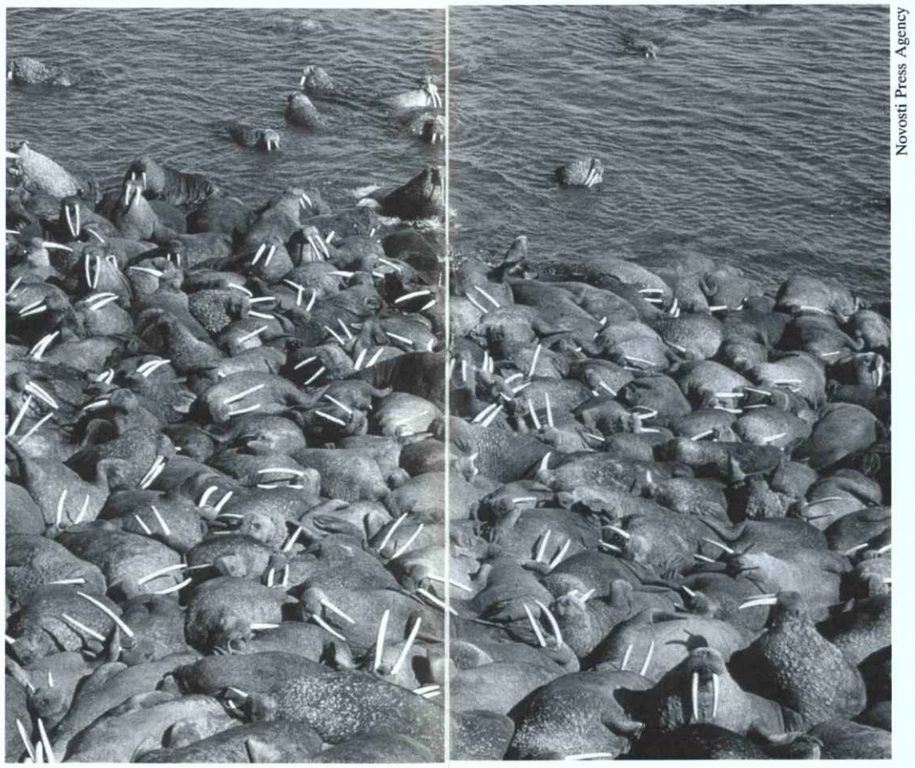
Impact of human activity

Until recently, man's behaviour towards the Arctic was one of gross expansion. Hunters have been replaced by geologists, miners, oil workers and builders. Many human factors are upsetting the natural biospheric processes and cycles, breaking the functional ties, and causing ecological anomalies.

The gravest problem is caused by the discharge into the Arctic seas of thousands of tons of pollutants (oil products, carbolic and other acids, heavy metal salts, pesticides, etc.). Pollution is particularly rife in the North Atlantic and in the adjoining western sector of the Arctic.

The first distress signals came in the North Atlantic in the late 1960s. One of the symptoms was a deterioration in the wrack grass through being attacked by Labyrinthula spores, a phenomenon that can only have been caused by pollution. The fact that this plant was diseased led to a sharp reduction in the numbers of Brent geese, the smallest of the Arctic geese, whose main source of food in the winter months is wrack grass. The geese have managed to survive by changing their winter feeding habits, unlike many other inhabitants of the Arctic seas. A number of fish species which lay their eggs on blades of grass have been unable to adapt to the new conditions. It so happens that the wrack grass concerned is beginning to re-establish itself, but too slowly, and not everywhere.

Walruses (Odobenus rosmarus)



Novosti Press Agency

The spread of pollutants in the Arctic sea depends on many factors: sea and air currents, the way the pollutants are discharged, the patterns of the coastline, the relief of the seabed etc. Many substances are transmitted through the foodchain and are to be found in the tissues of fish, birds and animals thousands of miles from the sources of the pollution. Because biological processes in the Arctic are so slow, nature has no inherent defence mechanism against most types of pollutant. For example petroleum and its derivatives are not broken up in the Arctic. Ecologists are at present devoting particular attention to the North Atlantic where oil is extracted directly on the continental shelf. However, the situation, is also deteriorating alarmingly in the eastern sector of the Arctic, particularly in the Kara Sea.

The Kara Sea receives water from the Ob River Basin where the USSR's main oil reserves are concentrated and where vast quantities of oil have been produced for a quarter of a century. The oil has polluted many lakes in the area and enormous concentrations of it have settled in the underwater silt, the mud and the peat, whence it is starting to work its way into major rivers that flow into the ocean. In other words, a powerful ecological bomb is forming in the Ob Basin, and represents a threat to the whole of the Arctic and the Arctic Ocean.

To the east of the Kara Sea, between the Taimyr and the Bering Strait – in the Laptev, East Siberian and Chuckchee Seas – the ecological situation is still relatively good because the territories bordering on the Arctic Ocean have not yet been exploited financially. There, the ecosystems suffer the impact of the barbaric hunting for marine animals that has prevailed up until recently.

Many unknown factors

Owing to the extremely difficult conditions affecting Arctic ecosystems, their slight recovery potential and the lack of compensatory mechanisms, nature is acutely sensitive to all human intervention in the region. At the same time, we still do not know the precise threshold limits. Everything leads us to believe that these limits have already been reached, not to say exceeded. We still have no hard-and-fast theory that might serve as a basis for environmental policy in the sub-Arctic states.

In the context of the growing specialisation and divergence of various branches of science, the development of systemic and interdisciplinary approaches to studying the Arctic as part of the terrestrial biosphere is gaining in importance. The following are examples of the main directions such a research programme might take:

– the role played by the Arctic in the Earth's climatic balance;

– the stability of the Arctic's climatic balance, especially in the sub-Atlantic and Kara Sea sectors;

– study of effluent discharge into the Arctic Ocean;

– the role of biotic factors in the life of the Arctic ecosystems;

– Arctic ecosystems, their natural development and their recuperative capacity;

– the dependence of ecosystems and their components in relation to temporary and accumulatory processes and to the different forms of the submarine and terrestrial relief;

– the comparative characteristics of various sectors of the Arctic and sub-Arctic regions;

– the impact of various forms of industrial exploitation of natural resources in the Arctic; the effect of different types of pollutants on the ecosystems;

– the historical development of Arctic ecosystems, scientific reconstruction of their lost components, methods of practical restoration;

– indigenous forms of exploiting nature and their impact on the local ecosystems;

– protection of the aboriginal ethnic groups living in the Far North from the economic, social, demographic, medical points of view.

Clearly a programme of this kind can only be implemented at international level, in the form of close co-operation between scientists from many countries. The concept of "sub-Arctic state" needs to be given wider scope.

We must bear in mind that the ecological situation in the Arctic is critical to the extent that there remains little time in which to stabilise and readjust it. Drastic concrete measures must be taken immediately. Among the measures urgently required are:

– total demilitarisation of the Arctic, transforming it into a nuclear-free zone;

– the setting-up of a single international system for monitoring the environment in the Arctic and sub-Arctic regions;

– renunciation by states of oil production on the Arctic continental shelf (at least, given the present technological situation, until the year 2000 at the earliest);

– the introduction of strict international quotas regarding the exploitation of all the Arctic's biological resources, in the Northern Atlantic and North Pacific;

– restrictions on economic activity in the Arctic, except for transport purposes. ■

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In ancient times the crane was the symbol of democracy. What better present-day symbol of environment protection in our "European home"?

J. Chevallier 1990

NGOs – a force to be reckoned with

Raymond Van Ermen

The present upheavals in Eastern Europe are like a groundswell. However bright or however gloomy the aftermath, it is certain that nothing will ever be quite the same again.

Where the environment is concerned, the effects will be felt on several different levels.

Economic development and public finance

When the Trabant motor-cars began to invade West Berlin, public opinion in the Federal Republic of Germany had to face the fact that standards must either be levelled upwards, in which case there would be a price to pay, or be rendered compatible with the resources of the weakest economies and so allow the environment to deteriorate still more rapidly.

The problem would not be serious if aid were needed by only a small number of countries. But in Europe alone, it is clear that financial needs are colossal. The state of the environment in countries like Czechoslovakia and Poland is nothing short of catastrophic. But other countries also need assistance in particular those of Southern Europe. In other words, neither conventional nor even exceptional resources will ever suffice, even if assistance could be confined to Europe, which of course is inconceivable.

We must, then, prepare for a very wide-ranging debate on what type of economic development we want and how the budgets of our public authorities are to be restructured. Such changes cannot be accomplished without the constant involvement and effort of the NGOs, for even if industrial redeployment has its advocates, even on the inside, both it and budgetary reform conflict with so many short-term interests that public pressure must be exerted constantly and from all sides.

Natural and cultural heritage

The diversity of Europe's countries has both shaped and enriched our cultural heritage. Efforts are being made today throughout Europe to save, recover and restore the heritage that is the envy of the whole world.

Voluntary organisations continue, as always, to have a decisive role in this respect. The heritage of whole towns has been preserved, thanks to the devoted and persistent endeavours of hundreds of citizens' associations. Within the European Community, transfrontier cultural routes are being opened up such as the Santiago Way and the Sarre-Lux-Lorraine trail. Others will soon cross what used to be the iron curtain.

Similarly, the natural heritage is today being defended by hundreds of voluntary organisations. Decades of campaigning are magnificently symbolised by the free flight of a migrating bird which knows no frontiers. Nature reserves and regional nature parks are Europe's basic instruments of conservation. All this would have been away by industrial development, but for the determined efforts of millions of citizens.

It is essential now that networks of areas of natural or cultural interest be constituted and their European importance recognised by governments, as in the case of the European Community's action to safeguard wild birds and their habitats. Specific conditions should then be laid down for their protection.

Future of democracy

Developments in Eastern Europe represent a major victory for democracy, but this should not conceal another aspect of the truth: where democracy is concerned, there is still considerable room for improvement within the European Community!

From this standpoint, the present debates of the European Council of Ministers of the Environment are very instructive. Two of the agenda items give occasion to assess one's position vis-à-vis public opinion on the theme of democracy in the European community: one is the draft directive on freedom of access to information on environmental matters; the other is the proposed European Environment Agency.

For environmental groups within the Community, these two themes must be linked. Free access to information must be guaranteed – this is already the case in the USA, whereas Europe still has a long way to go – and the European Environment Agency must be approachable and accountable.

It is the intention of the NGOs to conduct their campaign for sustainable development consistent with the need to safeguard the natural and cultural heritage as part of a movement for transfrontier co-operation and greater democracy. This explains the close links that have developed between them over the years. Hence the significance of their East/West meeting on the Danube – planned for March 1990 – where the NGOs will prepare their contribution to the conferences on the Brundtland report. ■

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Lady's slipper (Cypripedium calceolus)

H. Wenzel

W. Lapinski

A continent of forests

Jürgen Huss

Europe, the second smallest continent, nonetheless presents a great variety of landscapes. On the one hand, there are the almost tropical climates of southern Spain and Crete and the cold tundra regions of northern Scandinavia, and on the other, maritime regions which are cool and humid throughout the year, such as Ireland, and distinctly continental regions, such as Russia, with cold, dry winters and hot summers.

Furthermore, this extremely wide spectrum of climates is, over small stretches, moulded by a deep indentation of the coastlines and by a wide variety of mountain ranges and hills of very different geological origin.

That explains why Europe offers – more markedly than any other continent – a great diversity of landscapes within the smallest possible space.

The forest as an ubiquitous form of vegetation

In this respect too, Europe is unique: the amount of rainfall and its distribution, as well as the temperatures, encourage the growth of forests almost everywhere. Scarcely more than 10% of the territory are an exception to this: high mountain areas, some bogland regions, windswept stretches along the coasts, small areas of tundra in the north, and finally the steppes of the Ukraine in the south-east of the continent.

In harmony with this variety of landscapes, the forests offered an extremely diversified spectacle, before man intervened to modify it. This is however inconsistent with the fact that the greater part of the continent lying to the north of the mountain ranges of the Pyrenees, Alps and Carpathians running from east to west, was overlaid and formed by several glacial periods. In contrast with North America, for example, the orientation of those mountain ranges prevented a great many varieties of plants from escaping to the salutary regions in the south; consequently they died out. From the botanical point of view, central and northern Europe accordingly became impoverished. That is apparent from the number of species of trees: the forests of North America today give shelter to more than 800, including 70 species of oak, whereas the forests of central Europe contain only 50 species of tree, and three types of oak.

The main areas of vegetation

In highly simplified terms, Europe can be sub-divided into three regions:

1. The mediterranean broadleaved hardwood region

Along the coastal strips and in the plains of all the countries adjacent to the Mediterranean, there is a predominance of heterogeneous forests with evergreen hardwood species (especially oaks) mixed with pines. The mountain forests, on the other hand, are characterised by conifers such as black pine, cedar and various types of fir. Their composition and structure often vary abruptly as a result of the already mentioned fluctuation in biological conditions, the unevenness of the relief and marked ecological differences between slopes exposed to the sun and those exposed to the shade.

2. The region of forests of deciduous trees

Despite all the differences between western Europe influenced by the Atlantic and eastern Europe with distinctly continental features, both regions share a lack of variety of species, as a result of the glacial periods, and a predominance of deciduous trees. To the west, we find primarily beech, oak and ash, whereas towards the east, these species are superseded by oak and pine, which are more drought-resistant. In southern Russia, nothing but steppes can subsist, with their typical long grass.

It was only in the numerous mountainous areas in this territory that conifers such as fir, spruce, mountain pine and larch, mixed with deciduous trees, were able to hold their own.

3. The northern European coniferous region

Northern Europe forms part of the huge boreal belt of conifers which stretches from Alaska – spanning the northern hemisphere – as far as north-east Asia. In northern Europe it only consists of a small number of species: pine, spruce and silver birch, together with a few miniature shrubs, which then constitute the sole form of vegetation after the transition to the polar tundra.

Human influence

The cradle of humanity was constituted by the sub-tropical and temperate regions of the earth. That was where the first great civilisations developed. Later on, as in Asia – some 5,000 years ago – the light, thin forests in the Mediterranean region were gradually pushed back to the higher mountain altitudes. Thus it was man who wanted to make room for the planting of crops, fruit trees and vineyards, for towns and roads, for trade and commerce. Some forests were only cut down later on, for example that in the north of Spain, when Philip II used its timber to build the Armada launched against England in 1588.

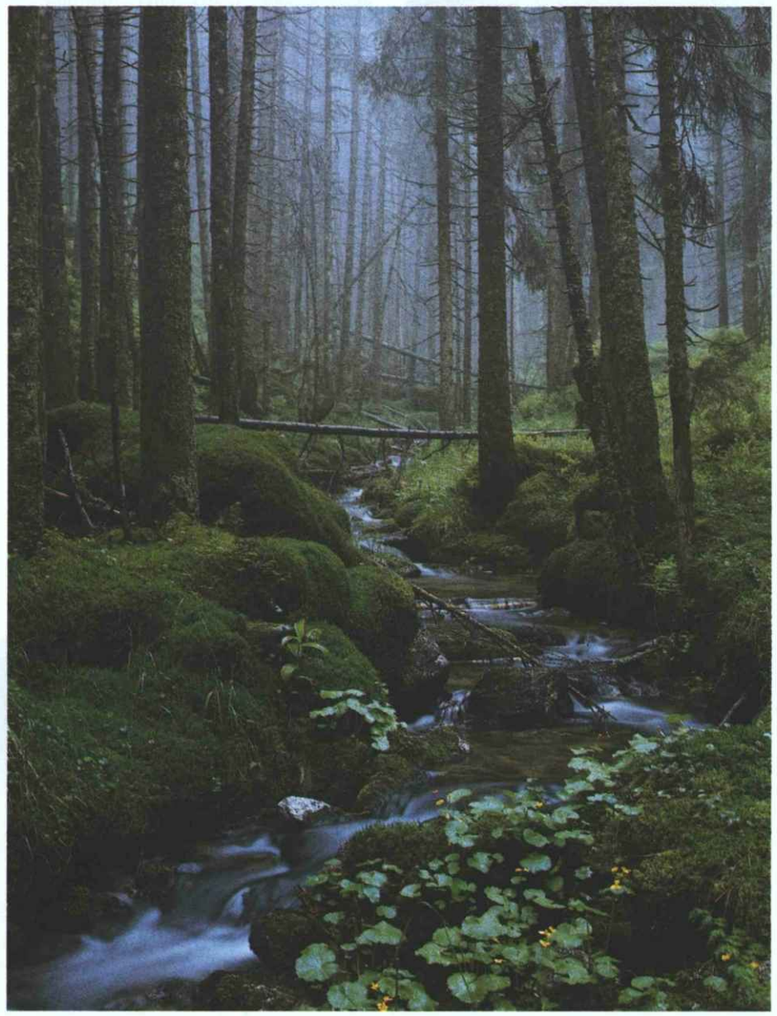
An undisturbed regeneration of the forests was prevented for centuries, and in some areas for thousands of years, by the droves of cattle, horses, goats and sheep. As the forests were continually being gnawed down, they degenerated over large areas into the shrub and thorn bush growths of the maquis and scrubland. The careless use of fire contributed in the past, as it still does today, to the natural selection of deciduous species in the sun-parched Mediterranean areas and continuously calls in question the success of well-intentioned reforestation efforts.

In western, central and eastern Europe, the great clearance periods began much later. But by the end of the Middle Ages, in the 15th century, the present stage of the division between forest and cultivated lands had already to a large extent been reached. Any land which could be used for agriculture was cleared. Only about a third of the wooded areas remained: in the west (Ireland, Great Britain, Holland) considerably less, and more in mountainous areas. For centuries, the remaining forests were the primary source of energy for households and industry. A special form of forest was created for the production of soft firewood which was consequently easy to transport, the so-called coppices, where advantage was taken of the fact that a large number of species of deciduous tree sprout easily from the base. Millions of hectares in France and Italy are still covered with them today. Apart from the fact that timber was the most important building material in the south, the forests also had to provide forage for countless hungry herds of cattle. Furthermore, the dead leaves and needles mixed with the animals' dung were for centuries the only source of manure for fields. That was why the woods which had not initially been cleared gradually also became desertified and, in certain regions, erosion by wind and water became a serious threat.

Towards 1800, there was a gradual change in attitudes, particularly in central Europe. People began to replant areas lying fallow with conifers and to manage forests systematically. Such reforestation and transformation of deciduous forests into plantations of conifers only became really important and made an impact on the landscapes of western and southern Europe from the mid-20th century onwards.

The clearing of woodland in Scandinavia is a still more recent phenomenon. However, owing to the inferior quality of the soil, it was never on the same scale as in the areas further south. Furthermore, the huge forest areas which remained were never as rigorously exploited by being converted into grazing land and used for the other purposes already mentioned above.

Nonetheless, it can in short be said for Europe as a whole that there is virtually not one single square metre of forest left on this continent which has not been touched by the hand of man. In fact, it is only in barely accessible mountainous regions in the south-east and in remote areas of Scandinavia and Russia that paltry remnants of the original natural forest have managed to survive.



W. Lapinski

The same is, however, also true of the unwooded natural areas. Thus, the marshes which at one time were very widespread in central Europe have almost entirely disappeared, and already in the 19th century the steppes of southern Russia were largely converted into farmland areas; those which still remain today are to be found only in nature reserves.

Dangers

Forests have always been subject to numerous biotic and abiotic pressures, which have a decisive impact on their dynamic force. In areas close to the sea, the influence of storms is predominant. In the boreal forests of the north, the forests of a continental type in the east and the dry forests in the south, the main danger is that of large forest fires.

The extensive planting of conifers in regions which were previously covered with deciduous trees and also, to a certain extent, the use of inappropriate seeds and plants have certainly contributed to a considerable growth in overall output, but there has also been a drastic increase in the risks. Unnatural forest ecosystems generally prove to be more vulnerable, particularly as the number of potential man-made risks has increased substantially. The damage to forests only became a major problem as a result of large-scale reforestation, and it has since then been necessary to take extensive measures to protect the forest environment.

For some time, the effects of substantial regional concentrations of industry and the widespread use of fossil energies have constituted new and extremely threatening factors, which are, however, highly contentious.

Hence the emissions of sulphur dioxide, which damage vegetation and amount to several million tons per year, particularly in eastern Europe, have resulted in the death of tens of thousands of hectares of forest, particularly in mountain areas, and elsewhere, in a reduction in their vitality. Nitrogen oxide, a product of combustion processes in industry and motor vehicles, does indeed increase the problems of acidification but it also provides forest soil with nitrogen, a nutritional element, thereby improving the forest productivity. There is at present considerable uncertainty about the dangers which may result from changes in climate caused by the pollution of the earth's atmosphere. The forecast for the coming decades predicts alarming increases in average temperatures and increasingly frequent drought years. This development would particularly affect the species which are well-adapted to a maritime climate such as beech, but also fir and even spruce. On the other hand the species which are more resistant to drought such as pine, oak and also Douglas fir might profit from it.

The importance of forests and their future appearance

There are only a few areas in the world where forests have such varied functions to fulfil as in Europe – and mostly simultaneously, all over the place. Generally speaking, the production of raw materials for a highly developed timber industry still plays a significant role. At the regional level, as in northern and increasingly also in western Europe, it continues to be very important. But to an increasing extent, the forests now take on protective functions. That is particularly true in regard to the protection of water catchment areas. It seem likely that, in the coming decades, this task will be a priority consideration. Similarly, protection from erosion is becoming increasingly important in many mountain areas made more vulnerable by population growth. The forest situated near countless large and small towns, centres of industrial concentration or tourism are becoming popular leisure areas. Lastly forests are increasingly used as a retreat by a number of threatened animal and plant species which no longer find anything but hostile living conditions in the open country.

These different objectives accordingly lead to various consequences in regard to the composition and structure of the forests.

In regions where timber production has priority, in northern but also in western Europe, reforestation over large areas predominates. Highly productive, "exotic" species, particularly from North America, play a decisive role in this context: Sitka pines and *Picea contorta* in the maritime west, Douglas firs and cedars in the warmer transitional climate, *Picea radiata* and Aleppo pines in the Mediterranean region. In the regions further south, one only occasionally finds broadleaved species, for example poplars and eucalyptus trees in river valleys. However, in the Mediterranean area too, reforestation with conifers is predominant, often at the expense of unnatural shrubs. For the time being, although projects are still being discussed rather than implemented, the planting of fast-growing species on uneconomic agricultural land which is beginning to lie fallow is likely to be used for the production of biomass energy. Generally speaking, that ought to result in a slow but continual growth in wooded areas. As a result of intensified forestry, the average European woods are becoming younger and less diversified and – as we have already said – their vulnerability to a number of dangers is increasing.

In view of the multi-functional nature of forests mentioned above, and in particular their protective capacity, the idea is increasingly gaining ground – at least in central Europe – that mixed, natural forests adapted to local circumstances are less threatened, and in the long term are more successful in performing protective functions. Consequently in some areas a "return" to "natural" types of forest is taking place, thereby inaugurating a period more favourable to the deciduous species. However, those are merely preliminary steps, and it will be decades before a substantial change in the situation can be expected. Similarly the aesthetic qualities of forests in leisure areas, which are continually on the increase, are attracting more and more attention. But here too, the changes arising out of the measures which have been set in motion will only come about gradually.

Nowhere are the forecasts on the evolution of forests so favourable as in Europe, but here too, for the time being, they are accompanied by a great many misgivings and uncertainties. ■

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Foto GRILL KG

From the source at Donaueschingen …

The Danube

A noble cause

János Zákonyi

If the son of today travels as a tourist along the most international river of our planet, the Danube, he is in for a great many surprises. During his voyage, beautiful sceneries follow one after the other, green forests and fertile plain lands, the remnants of a rich historical past and the most recent results of civilisation. Those who have made this journey several times may have experienced that at the borders the time allocated to passport control has decreased, while politeness has increased, and the atmosphere surrounding the foreigner has become significantly "milder".

At the same time the surprise is frequently transformed into shock. The observant eye discovers a reduction in the number of people bathing in the river in the summer, large masses of sewage entering the river, heaps of wastes lying along the banks, traces of human "interference" in the flora and fauna crying for help.

Awareness

Both symbolically and in reality, the voyage described above is made by an increasing number of politicians, scientists, experts and environmental activists. A whole host of international conferences indicate the tasks to be performed in the present and in the future, smaller communities, towns, cities and governments declare their standpoints related to the desirable relationship between nature and man. The present new phase of European development seems to be opening new vistas for the co-operation of the countries concerned, including the one among the countries along the Danube river.

This co-operation, or the intention of co-operation in this region, looks back over a long past. In the 19th century as well as in the first half of the 20th century, a number of multilateral co-operation plans were put forward, the majority of which were attached to the idea of federalism. However, the potential partners were unable to harmonise their own national interests with the system of common interests. Enthusiasm was generally short-lived, the initiatives lacked the support of the peoples of the countries concerned. Those making propositions had no power to support their ideas, and in those days the great powers had no trust in the future image of the Danube region outlined in the plans.

Man's technology

However, in the second half of our century the socio-economic development of the countries along the Danube has accelerated. The increased production and consumption of the population devoured at a rapid pace the natural resources which seemed to be "riches of free access", the air, the soil, the waters, exploiting the living world and making it the recipient of their wastes. The impact of human interference, having existed for centuries but having been relatively negligible from the point of view of the ecological balance earlier, came to be enhanced by modern technology to an unprecedented degree and "man" did make good use of his potentials. Each man-made influence on the river and its environment aimed at improving the population's living conditions has hidden within it the danger of known and unknown disadvantageous consequences.

The Danube is the second longest river of our continent, covering 1,900 km from the Black Forest to the Black Sea. Its catchment area is 817,000 km^2, one-twelfth of the territory of Europe. It concerns eight countries directly, but its catchment area extends to another four countries as well. It has 21 affluents which are longer than 200 km and 171 affluents whose length exceeds 20 km. On the yearly average, it transports 200 billion m^3 of water to the Black Sea, which is equivalent to a current of 6,500 m^3/sec. Its delta region exceeds 5,500 km^2.

The 12 countries whose waters are wholly or partially collected by the Danube have more than 450 million inhabitants. There are nine cities with a population of 100,000 situated along the river bank and their water supply, as well as that of a number of other smaller settlements, is mainly furnished by the Danube. It also caters for aquifers under the surface of enormous significance, principally from the point of view of satisfying water requirements in the future. All that – for example Hungary receives 94–96% of its surface waters via the Danube and Tisza rivers from abroad, constituting the drinking water of more than 20% of the population – is provided by the Danube. More than 60% of industry's freshwater utilisation originates also from this river.

A number of natural habitats have survived along the Danube in Hungary up to the present day. The natural scenery has preserved flood plain forests arranged in a ribbon-like configuration along the river. These are woodlands of softwood trees, containing our characteristic indigenous species, *Populus nigra, P. canescens* and *Salix alba*. In places where the flooded area has widened, on the plateaux lying somewhat higher, groves of hardwood trees have been formulated with a dominance of *Quercus robur*. These forests of larger dimensions have preserved a valuable fauna.

The Danube's water is extensively used for irrigation purposes and fishing is significant, carried out both directly and in the fishponds as well as in the delta region. The industrial activities performed on the Danube require especially large quantities of cool water, crudely purified to eliminate the suspended matter. These industries include steam power plants, refineries, iron and steel, chemicals, dockyards, sugar production and mines, as well as paper and cellulose.

International sewer

The river offers a great number of benefits to the population exceeding 70 million living in its drainage area which, in turn, jeopardises desired living conditions. The Danube has become the sewer of eight countries, upsetting the biological and chemical balance of 1the river. Extensive dams used for generating energy have altered the natural regime, reducing or terminating the continuous supply of bedload, bringing about undesired changes in the ecological status. Structures of flow regulation, water transport as well as the utilisation of large quantities of water, together with man-made influences, have created the present disadvantageous situation. Waste water is generally discharged into the Danube after a certain degree of purification. Industries requiring water of a higher quality use ground water taken from the nearby river bank. Growing pollution increases the costs of water purification and, consequently, the expenses of industrial production.

The pollution of the Danube as well as its tributaries caused by domestic sewage is significant. As referred to already, 70 million people live in the drainage area, and only a part of the sewage is purified. In some cases, even the larger towns and cities on the Danube lack sewage plants equipped with biological purification facilities.

The concentration of plant nutrients – organic and inorganic nitrogen compounds, phosphorus formations – in the water of the Danube still displays a tendency of increase, though its rate of increase has slowed down. This is an extremely important issue since, in the opinion of experts, the water quality of the Danube is determined by the processes of eutrophication taking place in it.

At the same time, we consider it important that the level of concentration of the so-called micropollutants is relatively favourable in the Danube; there has been no need to reduce the utilisation of water on account of such components so far. It is quite unfortunate, however, that the bacterial contamination of the Danube is increasing almost parallel to eutrophication.

Increasing international co-operation

In summary: it is a highly important task to reduce the load of the Danube (especially its eutrophical load). The harmonisation of comprehensive national efforts including several sectors of the economy, striving for identical purposes, may constitute its basis.

As can also be seen from the above, the question of restoring the deteriorated relationship between man and his natural environment appears elementary among the multifarious problems of the Danube region. The solution of this task may only be possible among the countries situated in this region in the field of environment protection and nature conservation, aiming at finding common interests.

First and foremost, it is necessary to continue and intensify joint efforts to reveal the causes of contamination and carry out a scientific appraisal of the environmental state of the Danube basin. Scientific and administrative bodies, their groups of experts and social organisations have laid down the basis of further steps within the framework of bilateral and multilateral co-operation. Inestimable contributions to this noble cause have been made by the different stations of the Conference on Security and Co-operation in Europe process, the different UN and other intergovernmental organisations, with special regard to the European Economic Communities, World Health Organisation, Unesco, and from another side, by the Council of Europe, Organisation for Economic Co-operation and Development, and others.

For example, on the issue of water contamination crossing borders, several principles and recommendations have been formulated which have undoubtedly contributed to protecting the freshwater reserves of Europe, reducing the contamination of rivers, as well as enhancing international co-operation in this matter.

However, the efforts so far have not been able to stop the contamination process and bring about a meaningful improvement in this field. A number of countries are contaminating other countries even today. The questions of responsibility and compensation have not yet been settled. Economic and law science have not yet penetrated the technical-professional questions of protecting water quality to the desired degree. Harmonised indices and standards related to water quality have only been partially established and the evaluation methods frequently differ. The facilities and equipment available are deficient, the number of automatic monitoring systems is insufficient. It is inevitably necessary that the rights, obligations and responsibility of the countries situated in the same catchment area be formulated unequivocally, and that the national environmental protection and water management policies as well as planning processes be better coordinated. Limiting and prohibiting measures are to be introduced related to emptying contaminants into the water currents and rules harmonised at an international level must be set up in order to prevent and eliminate contaminations.

The multifarious and highly active work, full of valuable initiatives, performed by the non-governmental scientific organisations deserves unqualified recognition. At the same time, the situation today requires more systematised and purposeful co-operation from all the participants. A good basis for that is provided by the Declaration on the co-operation of the Danube countries on water management and especially water pollution control issues of the river Danube (accepted in Bucharest), signed by the governments of the countries along the Danube in 1985.

Simultaneously with the above, it is inevitably necessary to accelerate practical steps in order to improve the ecological state of the Danube region. It is highly justified to pay greater attention to sustainable development, and a restructuring in that direction not only in the Danube's surroundings, but also in the whole of the basin.

"Common European Home"

The complexity of the ecological tasks also requires the development of mechanisms and international co-operation. It is their obligation to ensure to a greater degree the more extensive manifestation of the ecological interests of the Danube countries in international fora as well as in the co-operation of these countries and the smaller communities. The strengthening of international relations in the Danube region countries must promote the intensification of the results of common European co-operation in the field of environment protection. In this way, the Danube region may become the central staircase to the "Common European Home" to be erected, its strong supporting pillar, serving its own development as well as the development of the whole continent.

The probable answer to the question "Can we be optimistic?" is that we cannot entertain illusions in today's ecological situation. Instead of being either optimistic or pessimistic, let us be realistic. We should, however, be realistic in the way we watch and understand the requirements of the new era, and, first and foremost, we must do our utmost to take initiatives, be active, and work hard in order to foster the realisation of those requirements. ■

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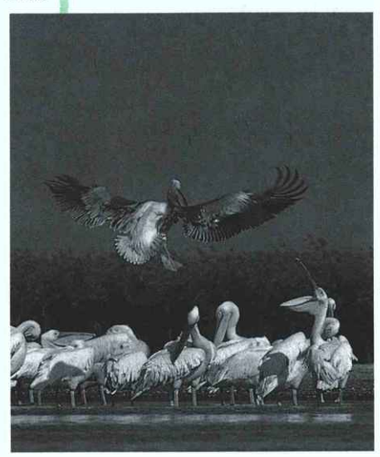
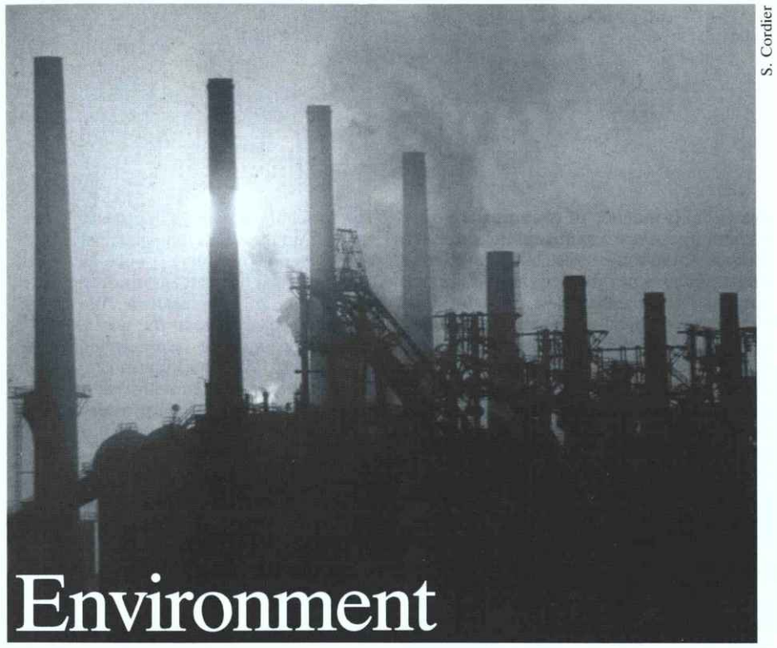
… to the delta where the Romanian authorities have just decided to create a national park. Let us render homage to this radical change of attitude in the environmental policies of Romania, which can only be favourable to the largest European delta!



D. Robert Association "le Danube Vert"



S. Cordier

Environment and health

Stanislaw Tarkowski
Colin J. Macfarlane

We all seem to agree that our European environment is a lot less than perfect. But we cannot capture the apt word that catches our dissatisfaction with the present, or expresses our uneasiness for the future. We sense rather than know something is very wrong. Dr. H. Nakajima, Director General of the World Health Organisation told the 42nd World Health Assembly that the "world is heading for an environmental crisis and the final price will be paid in terms of human health".

The Conference on the environment, held in Stockholm in 1972, dramatically raised public awareness, concentrating on the natural environment, its flora and fauna, and on land-use and control of pollution. Although the health implications of what was being discussed were profound, they were not spelled out clearly in sufficient detail. While damage to the land and the impoverishment of species come as a result of policies neglecting environmental needs, the effects on human health have been much less considered. So far, more engineers and natural scientists, as opposed to medical professionals, have concerned themselves with environmental problems.

Well-known problems

This is in contrast to the deep concern and anxiety felt by Europeans and people in other regions of the world regarding the impact of changes in the environment on human health. It is also in contrast to the growing knowledge on serious public health dimensions of the degrading environment. In the past 40 years we occassionally have counted our casualties – the human toll during the London winter smog in 1952; the health and psycho-social implications of the Seveso incident in 1976; the massive poisoning in Spain in 1981 as a result of consumption of contaminated edible oil. In April 1986 a nuclear reactor at Chernobyl was damaged following a major accident at the plant, and large areas of Europe were contaminated by radioactive fall-out. Although there only was a relatively small number of casualties as a result of the accident, several hundred thousand people were put in potential danger and thousands in parts of the Soviet Union will have a shortened life-span.

Increased mechanisation, irrigation, drainage and use of fertilisers and pesticides have led to soil erosion, land, air, water and food pollution resulting in major health ramifications. The nitrate content has, for example, greatly increased in many ground water supply sources due to the use of fertilisers in agriculture. The observed result of such practice has, among others, been methaemoglobinaemia in infants due to contaminated drinking-water, and a potential increase in the incidence of gastric cancer.

During the last decade there has been increased awareness of links between housing and health. The urban environment is frequently a source of all major environmental and social problems affecting human health. Polluted outdoor and indoor environments are a source of complex human exposures to chemicals and physical health hazards. Urban environment is greatly determining mental health. Psychiatric disorders and drug addiction, in their initial stages, are essentially to be found in neglected urban areas.

The bigger, world-scale, enemy whose dimensions remain only dimly discerned is shaping up around acid rain, ozone depletion in the stratosphere and the "greenhouse" effect – all leading to climatic changes. These three are deeply interlinked. They stem from the good life of cars, abundant energy and chemical aids, which are the possessions of the rich and the envy of the poor.

Difficult choices

The dilemma is this: If the poor majority of the world get richer – and who can deny them an escape from poverty? – their addition to the world's cars, energy and chemicals can only hasten and worsen a looming environmental disaster.

Will the climate really change? Maybe. The best guess at the moment suggests an even chance of a coming marked climatic change – not good odds to take a chance on a wrong guess. What will a rapid climate change mean? We really are not quite sure but the average increase of temperature over the world by the year 2030 is likely to be about 3°C, with a maximum increase of about 8°C or 10°C in the high latitudes of the northern hemisphere.

If the predictions are correct, by the mid-21st century, sea levels could rise in the range of 0.2 to 1.4 metres; heat waves, storms and drought are likely to occur more frequently; and biologically important ultraviolet radiation may increase by a maximum of 25%. It is still too early to predict the chances in regional rainfall or wind patterns with any confidence.

The direct effects to health are likely to be most noticeable among the very young, the poor and the sick in terms of increased heat stress and illness in populations unaccustomed to elevated temperatures. The effects of ozone depletion are truly difficult to foretell but the chances are that the incidence of non-melanoma skin cancers will increase in the range 6–35% in the latter half of the next century. Most of the effects will be upon the light-skinned population, and the incidence in the southern hemisphere is likely to be considerably higher than in the northern hemisphere.

Other direct effects, such as increased incidence in malignant melanoma skin cancer and alterations in immune response seem probable, but it is still too soon to make any but the crudest estimates.

The essential problem is that we cannot predict events with sufficient clarity to give enough cogency to a contingency plan for the future. Events have been moving too quickly for us. Nevertheless, predictions of the more far-sighted scientists are becoming articles of faith for surprisingly far-sighted politicians throughout the world.

Prevention rather than cure

Fortunately, many of the more important human instincts for the righting of wrongs strike a responsive chord in the public before the full dimensions of possible consequences are revealed. This now seems to be the case with Europe's environment.

Europe is in a green mood – it may not be quite sure why – but it is quite sure that its instincts are well directed. The politicians, too, have caught the mood. How generous the discussions now devoted to the environmental view of each issue – how remarkable the sharpening of interest wrought in a few brief years! The Council of Europe seems to say – "if you want to be European, show a proper regard towards man and nature. Without a willingness to attain environmental decency, you are an outcast from our society."

Member States of the European Region of the World Health Organisation recognised the need to include prevention of environmental health hazards in the Regional Strategy of WHO "Health for All by the Year 2000". In 1984 they adopted regional targets specific to environmental health.

The WHO Charter for Health Promotion adopted in Ottawa in 1986 emphasised that "inextricable links between people and their environment constitute a basis for socio-ecological approach to health", and it went further to say that "the protection of the natural and built environments, and the conservation of natural resources must be addressed in any health promotion strategy".

A strong political expression of the need to prevent environmental health hazards and to create environments supportive to human health has been the main component of the European Charter on Environment and Health, submitted by the WHO Regional Office for Europe to, and endorsed by the Ministers of Health and Ministers of Environment of 29 European member States, and by the Commission of European Communities at the Conference on Environment and Health, held in Frankfurt 7 to 8 December 1989. The Charter recognised the dependence of human health on a wide range of crucial environmental factors and stresses the vital importance of preventing health hazards by protecting the environment. By adopting the Charter the governments have agreed upon the principles and strategies laid down as a firm commitment to action and cooperation in connection with identified regional priorities related to health and the environment. ■

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and politics

Otto von Habsburg

Politicians tend to react somewhat belatedly to topical issues. What they do is to a large extent determined by public opinion which takes its cue, with some hesitation, from the insights of an elite. This was the case in the 19th century when social issues loomed large, and it is so again today with the problems of our environment. Not so very long ago, only one European in a thousand knew the meaning of the word "ecology".

There are very good reasons for seeking a political solution. After the alarm was first raised by leading intellects, extremist groups began to take up the issue. They had no sensible solution to offer, but their cries were sufficiently shrill to rouse the masses. The idea was then relayed by the more traditional pressure groups and movements; later, as people learnt the truth the hard way, some progress was made towards a solution. Today, however, as the pace of events accelerates, time is quickly running out.

The new challenge also serves as a catalyst. One can see this particularly in the countries of the Eastern bloc where conservation has become an emotive subject, if only because that part of the world is probably a generation ahead of the rest in the process of destruction. The reason is twofold: production targets are incompatible with environmental protection; and where there is no free speech, protest is generally stifled until it is too late (think of Chernobyl).

The Hungarian liberation movement started in and around Nagymaros; the destruction of the Baltic landscape had the same effect. The death of the Bohemian forests and the demise of the natural environment in Saxony and Thuringia also started a political movement both within and beyond the country's borders, affecting the displaced persons who to this day retain a spiritual attachment to the land of their ancestors.

This intrinsic connection between freedom and environmental protection gives grounds for optimism. It would, of course, be madness to minimise the terrible danger that awaits humanity. But there is no cause for sombre pessimism: it is unhelpful and creates only apathy. Environmental problems are very largely of our own making; we can solve them too, if we would only apply the appropriate policies.

In earlier times all the talk was about water, and some judicious measures have been taken as a result. The fact that salmon can once again be caught in the upper reaches of the Thames gives an idea of what can be achieved. The forces of nature are still immense; it would be enough for mankind to give them free rein, and occasionally help them along.

The fact that it is in every politician's interests to be seen as nature's friend and not as its enemy, is proof that attitudes have changed. True, many men and women do not yet fully realise what must be done to ensure human survival. But whereas only a few decades ago they were complacent about it, today the opposite is the case. Therein lies the best hope of success. ■

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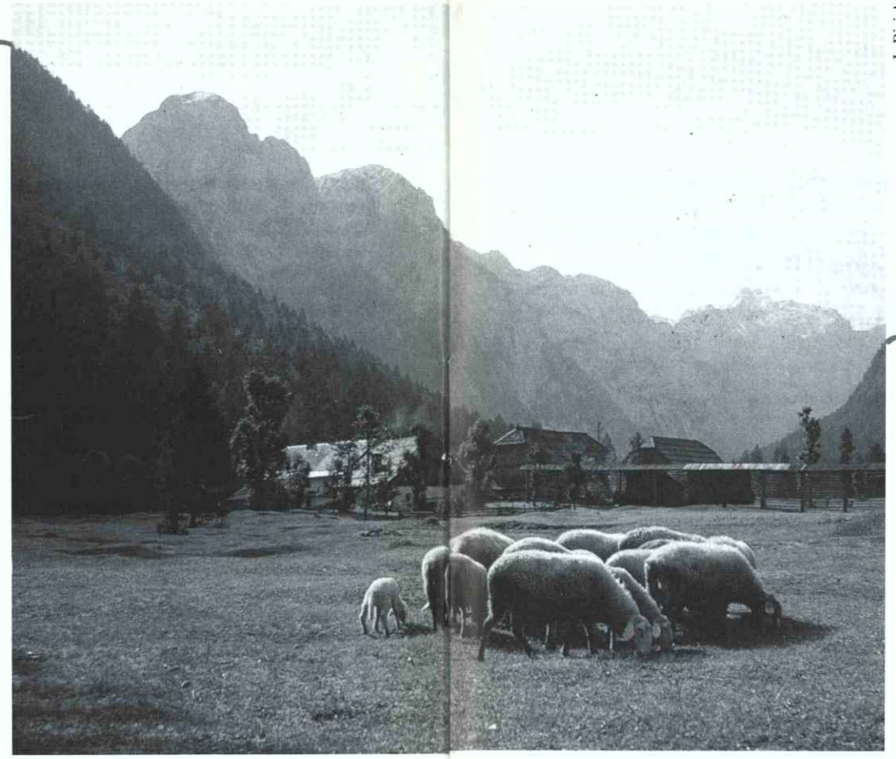
Ups – and downs



J. Bizjak

Janez Bizjak

Diversity dating from the times when the geology was formed, characteristic geographical and climatic features, myriad animal and plant species, a varied cultural heritage, picturesque and breathtaking landscapes – such are the basic characteristics common to Europe's mountain regions: an inexhaustible wealth in natural diversity, and a wealth that is enhanced by the very extent of the diversity. Such is our common natural and cultural heritage. We have not inherited it from our parents, but borrowed it from our children – to use an expression that has proved true time and time again. Every mountain range has its own characteristic features, offering up its sublime splendour to our gaze. We must provide the protection it deserves. There are precious gems hidden everywhere, their characteristic feature bestowing the reflection and personal image of each country, while, at the same time, enriching the memory and culture of the population living there.

A typical example

I can only refer here to a few details of the rich diversity of Europe's mountains, and shall confine myself to the Eastern Alps, in which I also have a professional interest, paying particular attention to the Slovenian Alpine region (Julian Alps, Karawanken and lower Limestone Alps).

The relief of the Eastern Alps is especially marked in Slovenia, where the valleys are wedged between deep escarpments, carved out by glaciers, and where the ground is covered in vestiges from the Ice Age and the Post Ice Age. The picturesque cirques and sheer scree slopes that surround these Alpine valleys on either side give the landscape its charm. The Alps themselves are dominated by limestone rock, and over the ages a special kind of karst has formed, together with a mysterious and unexplored underground network of chasms, potholes and caves. Characteristic of the Eastern Alps are the vertical rock faces in the North and the grassy meadows in the sunny South. On the edge of the Karawanken range, the end of the Alpine arc coincides with the outer edge of the oldest primary rock, which explains the special features of the limestone rock and the primary rocks found in this small area and the differences between them. The limestone rock has very little surface water, whereas the primary rock has an extraordinarily rich supply – not necessarily beneficial to the vegetation. The limestone rock, however, is a paradise for Alpine flora.

As regards the architectural traditions, the visible differences are easy to comprehend. In the Limestone Alps the principal building material is wood, whereas in the granitic Alps stone and slate are most commonly used.

A special environment for flora and fauna

The sight of flowers in full bloom growing without soil amongst nature's hardest rocks, or of a larch growing in a vast moraine is truly magnificent.

The distribution of species at the higher levels is conditioned by differences in altitude, temperature, humidity and precipitation. The high valley, sub-Alpine, Alpine and upper-Alpine regions each have their own characteristic vegetation to the extent that European mountain experts have devised a classic table: prominently deciduous trees at the lower alpine levels, followed higher up by coniferous forests of spruce and larch. Dwarf pines are to be found growing above the timber line, and higher still, plant communities are found growing in clumps on meadows and scree, in crevices and on snow-covered ground. For the sake of convenience, a distinction is made between species found growing above the timber line and those typical of the forests and alpine pastures, there being a quite marked difference between north-facing and south-facing slopes. This is especially apparent at Zgornje Posocje, where a beech forest grows on one side of the valley and a spruce forest on the other side. The sudden changes in vegetation make for very interesting strolls along the mountain passes.

The vegetation endemic to the region is particularly beautiful, and from June to mid-August the limestone rock is a veritable paradise for flowers – an enchanting world and unique experience for amateur botanists, experts and researchers.

In mountain regions animal species, like plant species, are classified according to altitude. Red deer, roe deer, foxes, badgers, martens, hares and hedgehogs are among the species living in wooded areas. The birds most commonly found here are the eagle owl, capercaillie and black grouse.

Above the timber line, among the rocks, live animal species whose symbolic significance has made them synonymous with the high mountains: chamois, ibex and marmot. Among the birds the golden eagle, vulture and buzzard are the best known. Eight couples of eagle are nesting in the Julian Alps and are heavily protected under the statutory provisions in force in Triglav National Park. Numerous ptarmigan (*Lagopus mutus*) are also to be found and – according to the experts – a relic of the Ice Age.

The organisms living in the water and wetlands – particularly those that are endemic to the region – are very important for the range of animal species.

The Slovenian part of the Alps is known for its many reptiles: most common at medium and high alpine altitudes here are the asp (*Vipera aspis*) and the adder (*V. berus*). Among the butterflies, the Apollo (*Parnassius apollo*) has pride of place.

The natural balance between herbivores and their natural enemies, carnivores, is upset when man, encroaching upon nature, forgets or declines to heed the fact that every animal species occupies an important place in the natural order. The imbalance affecting the European Alps and the ensuing conflicts are the result of unsolved problems in connection with hunters and the hunting lobby.

Rare animals

The bear (*Ursus arctos*) is rare in the Alpine region of Slovenia, and one of Europe's severely endangered animal species. Although not a year goes by without sightings of the bear in the forests of the Julian Alps and in the Karawanken, it is not certain that this region is its "home". Its basic territory lies in the vast and undisturbed forests of southern Slovenia (in the area around Kocevje and the river Kolpa), where 300 bears have been recorded. Migration takes the bear northwards and eastwards, and some experts believe bears will eventually settle on a long-term basis in Carinthia.

The region around Triglav National Park (Julian Alps) has always been favoured by the bear, a fact that is mentioned fairly frequently in folk tradition, legends, songs and representational art (ancient engravings). Further proof of the animal's presence is provided by old place names such as Bear Valley, Bear Head, Bear Forest, Bear Hole, Bear Field, Bear Chasm. Under an agreement between Slovenia, Carinthia and Venezia-Giulia, the bear is a protected species in the area around Triglav National Park, essentially because, it is hoped, the paths taken by the bears in the direction of Austria and Italy could develop into established migration routes. However, it must also be said that these protection measures are not taken seriously by some hunting associations.

The re-introduction of the lynx (*Lynx lynx*) in the Alps faces similar difficulties. The species' principal territory is also southern Slovenia, from where it has already spread throughout the entire province, and is moving towards Austria and Italy via the forests of the Julian Alps and the Karawanken. The federal province of Lower Austria is also attempting to reintroduce the lynx. Unfortunately, there are no protection measures to safeguard this species. At the moment the influence of hunting associations is still too strong, but the question of compensation (especially for sheep killed in the Alpine pastures) has not been settled.

The biosphere and Europe's cultural heritage

Agriculture and forestry make a very significant contribution to the diversity enriching the mountain landscapes. The Alps have their own distinctive man-made landscape. The human settlements present a range of characteristic features, those on the northern slopes of the Alps being immediately distinguishable from those on the southern side. The difference is due to architecture traditions and the characteristic construction methods for houses and outbuildings in the valleys and on the upland pastures. Picturesque details such as the intricate patchwork of fields and meadows, and the hamlets perched high up in the mountains are also part of the Alpine diversity.

Human activity in the mountains has always been subject to the balance of nature, and was never harmful as long as man saw himself as an integral part of the natural system rather than as a dominant and powerful force, there to exploit it. Economic activity in the mountains is not just another form of economic activity; it is also a particular form of culture. This human-scale economic structure in the Alps has used the experience of centuries to create a self-contained entity encompassing the settlements in the valleys and the summer farming high up in the mountains.

The landscape of the Alps is an example of man's harmony with nature. The main condition for survival was, and remains, harmony between ecology and economy. The combination of all the different populations who have settled in the Alps have created the Alpine landscape by the fact of living in it: many Germanic and Romanic peoples, as well as the other, smaller populations, each with their own characteristics, have added to the richness of this culture.

The legend of Zlatorog – a symbol of the future

Several hundred years ago, there grew up in the Julian Alps, the legend of Zlatorog, a mysterious white ram with golden horns. His wonderful garden high up in the mountains was a floral paradise and it was there that he guarded a hidden treasure. One day, however, a man came: he took Zlatorog's treasure and shot him, not realising that Zlatorog had magic powers. A flower grew up out of the blood of the wounded animal, and on eating this flower, Zlatorog was immediately healed. Moved by a holy wrath, he hurled the greedy hunter into the abyss, destroyed his Alpine paradise and disappeared forever. His treasure still lies buried somewhere in the mountains.

The legend projects the worries of the past into the future, speaking of nature's revenge on man, who dares to violate natural laws, ignores natural order and, by his arrogant interventions, destroys the natural balance. The damage is incalculable. By destroying natural beauty, man slowly destroys himself. It is time that nature ultimately creates new life and the process repeats itself except that man will no longer be there. Nature will have punished him. ■

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2030 is just round the corner

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Although it is quite impossible to predict the future, it is nevertheless useful to hypothesize about the nature of the environmental problems that might emerge in Europe in the next decades, and how those problems could be influenced by various trajectories of European socio-economic development, and associated environmental policies. This paper is a short summary highlighting these aspects.

Time-delayed, cumulative environmental effects

Because the response of the environment may not be linearly proportional to chemical inputs, nor synchronous with the time over which the inputs occur, effects that are not currently fully manifested may become increasingly serious in the future. The acidification of Europe's environment poignantly illustrates this fact. The pH of waters passing through non-calcareous soils is regulated by the soil's "cation exchange" buffering capacity. Essentially the acid (H^+) is exchanged in the soil by base cations Ca^{++}, Mg^{++}, or K^+). High acidic inputs occurring over decades gradually deplete a soil's supply of base cations. When 90 to 95% of the bases are depleted (which we shall call time ***t***), the soil's pH drops to the "aluminium" buffering capacity range with a pH of about 4.2 or lower. At this stage the soil becomes highly degraded owing to the loss of nutrient ions (Ca, Mg and K) and the release of aluminium ions, the latter of which are highly toxic.

Soils in various European regions have different buffering capacities. They are generally low in Scandianvian soils and relatively high in central Europe (ie Federal Republic of Germany, German Democatic Republic, Poland, Czechoslovakia, Hungary and Austria). Thus, many acid-sensitive soils in southern Scandinavia have already passed the point ***t***, beginning in the early decades of the 20th century. In contrast, most soils in central Europe have not yet reached the time ***t***. Model simulations conducted at IIASA (International Institute for Applied Systems Analysis) suggest in fact that the percentage of forest soils in central Europe with pH <4.0 will continue to increase from about 5% in 1980 to 45% by the year 2040 despite reductions in sulphur emission of at least 30% by 1993 (relative to 1980 levels), agreed upon by most European countries in the Helsinki Protocol of 1985.

Impact of global environmental change

It is virtually certain that, unlike European environmental problems in the past, the emerging problems will be increasingly linked to global-scale problems. The world's population is expected to reach eight billion in 30 years (currently it is five billion). About 90% of that increase is expected to occur in the third world. Over this time period the world economy could grow five or ten-fold, and energy use could easily double or triple. Most of this development will occur outside of Europe, particularly in the giant, rapidly industrialising nations (such as China, India and Brazil). Thus, the next generation of Europeans will be the first for whom environmental quality in Europe will depend largely on human activities generated outside Europe. Some of the most important changes are expected to be climate change, depletion of the ozone layer, and the disappearance of much of the world's tropical forests.

Political actions and environmental problems

Within the next 50 years, Europe's environment will be seriously threatened by increased acidification and toxification, ozone depletion, climate change, shortfalls in wood supply and numerous other problems. If these effects are to be mitigated, European actions must be taken in a time period that is rapid with respect to the time scales over which environmental effects are expected to occur. Also, the actions must match the spatial dimensions of the problem.

The figure 1 illustrates this necessity with respect to acid deposition, ozone depletion and climate change. Acid deposition is continental in scale and occur over decades to a century. Political actions, from the time the problem is first recognised at the national level, must occur over a few decades and must be implemented on a continental spatial scale. There is already some limited success in achieving effective actions through the 1985 Helsinki Protocol. (This action occurred approximately two decades after the first recognition of the problem in Scandinavia.) However, as we have seen for the case of central Europe, even stricter reductions will be needed in the future. The forest soils in this region are rapidly approaching time ***t*** and thus there is little time remaining for reversing the trend towards acidification.

With regard to ozone depletion, the Montreal Protocol, signed by all the major CFC-producing countries, calls for a 50% reduction in CFC production by 1999. The Protocol, although pointing in the right direction, has been criticised for not going far enough to reduce production. Similar to the case of acid deposition, further actions must be taken within the next few years in order to effectively mitigate the problem.

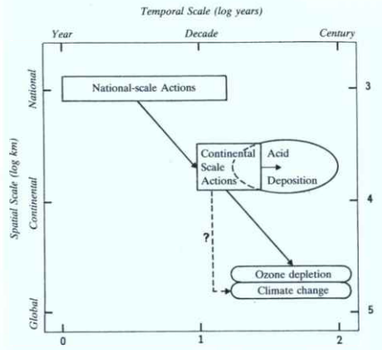

Fig. 1: Time-Space dimensions of environmental changes and political actions required to mitigate the changes

Because the bulk of CFCs is produced by a limited number of countries, a CFC convention is far simpler to undertake than is political action on control of CO_2. For the latter, co-operation from every continent will be required on a time scale comparable to that for enacting policies for reducing acid deposition and CFC emissions. Such action on a global scale is unprecedented. As described below, however, the environment of Europe in the future will be greatly influenced by the degree to which climate change can be slowed down, if not reversed.

Europe in 2030

The ultimate state of Europe's environment in the middle of the 21st century depends on fundamental societal choices that will have to be made in the next several decades. A recent IIASA study analysed the environmental implications of four alternative socio-economic development pathways with respect to 11 environmental issues (termed policy dilemmas) that could become major problems in the future. The policy dilemmas included:

– managing water resources in an era of climate change;

– acidification of soils and lakes in Europe;

– long-term forestry management and the possibility of a future shortfall in wood supply;

– areas of Europe marginalised by mainstream economic and agricultural development;

– sea level rise;

– chemical pollution of coastal waters;

– toxic materials build-up and the potential for chemical time-bombs;

– non-point-source emissions of potentially toxic substances;

– transportation growth versus air quality;

– decreasing multi-functionality of land owing to urban and suburban land development:

– increasing summer demand for electricity and the impact on air quality.

The four alternative socio-economic development pathways analysed were:

1) Present trends continuing in Europe and elsewhere, ie slow economic growth and modest success in slowing down environmental change, implying a moderate climate warming by the year 2030.

2) High-growth economy in Europe and elsewhere, with only lip service being paid to the environment, implying a strong climate warming by the year 2030.

3) Environmentally friendly economy in Europe and elsewhere, with only slight climate change by the year 2030.

4) Environmentally friendly economy in Europe but not elsewhere, where there is high economic growth without adequate environmental protection, implying a strong climate warming (as in pathway 2)).

The table shows the big picture derived from the analysis. Each of the dilemmas are coded by a circle, a triangle or a square and ranked according to development pathway:

- ● not serious
- ▲ moderately serious
- ■ very serious

In the first column the dilemmas are ranked relative to the 1980s. In the remaining columns they are ranked according to development pathway for the year 2030.

One may observe that relative to the 1980s, pathway 1) would lead to a somewhat more degraded environment in 2030, since all of the dilemmas except urbanisation and summer oxidant episodes would become more serious. The dilemmas are somewhat tempered by only moderate European climate change.

Pathway 2) would lead to strong deterioration with respect to all dilemmas. Broad-scale, strong climatic change creates problems specifically related to water management, sea level rise, and summer oxidant episodes, and global deforestation affects forestry wood supply.

Pathway 3) is the only one for which the dilemmas are largely solved, although the problem of transport growth would remain owing to the rapid increase in demand for transport, particularly in air and road travel.

Pathway 4) is particularly interesting because it addresses the important question of the linkages of the European environment to the global environment. It thus represents the optimal degree to which Europe can protect its environment when high-growth, non-sustainable development is occurring in the rest of the world. One may observe the direct effects of strong climate change and deforestation exemplified by the ■ rankings, and the indirect effects of strong climate change exemplified by the ▲ rankings.

Dilemmas	*1980s*	*Pathway (1) Present trends continuing Europe and elsewhere*	*Pathway (2) High-growth economy/low env. concern Europe and elsewhere*	*Pathway (3) Environmentally friendly economy Europe and elsewhere*	*Pathway (4) Environmentally friendly economy Europe but not elsewhere*
Water management	●	▲	■	●	■
Soil acidification	▲	■	■	●	●
Forestry wood supply	●	▲	■	●	■
Marginalised land	●	▲	▲	●	▲
Coastal issues • Sea level • Pollution	● ●	▲ ▲	■ ▲	● ●	■ ●
Chemical time bombs	●	▲	■	●	▲
Non-point toxics	●	▲	■	●	●
Transport growth	▲	■	■	▲	▲
Urbanisation	●	●	▲	●	▲
Summer oxidant episodes	▲	▲	■	●	▲

And tomorrow?

In summary, the major findings of the analysis are:

– the continuation of present trends in economic development and environmental protection in Europe and elsewhere is not sufficient to prevent further deterioration of the European environment;
– high economic growth in Europe and elsewhere without adequate environmental protection accompanying such growth will lead to even more severe environmental problems;
– environmentally friendly development in Europe offers the hope of mitigating local- and regional-scale problems specific to Europe.

But these actions, in and of themselves, cannot solve problems within Europe stemming from global-scale changes. To accomplish the latter, the rest of the world must also follow environmentally friendly pathways. Thus, European nations should do all in their power to enact environmentally friendly development both in Europe and in the rest of the world. As we have seen, however, actions must be taken within the next few decades in order to work effectively. ■

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At the Council of Europe

Nature knows no frontiers. Acknowledging this concept, the Council of Europe invited in 1969 almost all of Europe's countries to convene in Strasbourg for the launching ceremonies of European Conservation Year 1970.

This initiative was avidly followed by the Centre Naturopa which as of 1971 started sending its material not only to the Council of Europe's member States, but also to various interested non-member countries. Thus, all of the Centre's periodicals and the environmental material of the entire Council of Europe reach the administrators, researchers, naturalists, practically all over Europe. At the same time and parallel to the Centre's network of National Agencies in the member States, correspondents were established in most other European countries – as well as in for example the USA, Canada and Israel. The role of the Centre's (official) correspondents is to use its material at national level, and to inform and document the Centre on their national environmental issues such as legislation, creation of parks and reserves, red lists, and so forth.

In today's changing climate, with parliamentarians from, among others, the Soviet Union, Hungary, Poland and Yugoslavia participating in the Council of Europe's parliamentary sessions, the Centre welcomes the fact that Hungary has nominated a high official of the Ministry for Environment and Water Management as the Centre's official correspondent for this country. May other countries follow.

As the Council of Europe's "loudspeaker" for the state of the environment, the Centre Naturopa counts on continuing to do everything in its power as a catalyst, source of information, distributor of documentation, to help improve our environment. ■

"Energy policy can no longer be developed without deep consideration of the implications for the environment. This applies at all stages of the energy chain from the time energy is produced, through transportation and use, to waste disposal. Such environment threats as acid rain, the depletion of the ozone layer, the safe removal of toxic waste and above all, global climate warming will from now on help determine the shape of future Community energy policy." This quote from a recent EEC policy paper represents a straight appeal to the public and private sectors to seriously tackle the problem of energy saving and safe disposal of waste.

Local and regional authorities build and manage, directly or indirectly, a large number of buildings. They operate services such as street lighting, domestic refuse collection and disposal, water supply, cleaning, urban transport, etc. All of these involve them in heavy energy costs. Accordingly, they have an important part to play in policies concerning self-sufficiency in energy, insofar as this also affects town planning, management of services and exploitation of local energy services. Improvement or better use of existing equipment has been early recognised as a priority objective in town planning activities.

Although remarkable progress has been achieved in reducing energy consumption in towns, there still remains a further potential for cost-effective energy savings. There is a need for sustainable urban energy systems with a view to providing the required quality of life with the minimum of private and social costs and frictions.

With regard to urban transport, local authorities are fully aware of the need to give priorities to such policies which reduce operating costs to a minimum while preserving the desired air quality in towns. The conclusions of a Europe-wide enquiry among middle-sized European towns initiated by the CLRAE indicate that, in spite of the efforts undertaken by a number of towns with in part notable success, the present situation has to be described as highly unsatisfactory. In most instances, there exists an untapped and significant potential of possibilities concerning emission-reducing measures. The short- and medium-term development of the pollution of the air is particularly worrying as regards emissions of nitrogen oxides (NOx) and of hydrocarbons (Hc).

The interface transport-environment will remain on the CLRAE agenda for 1990, when the environmental consequences of transalpine traffic and of urban road traffic will be discussed at two conferences to be held in Innsbruck and Göteborg respectively. ■

A pan-European dialogue on agricultural policies and practices, involving farmers and politicians, is urgently needed for the strengthening of an environmentally friendly European agriculture. This is why the Committee on Agriculture of the Parliamentary Assembly has taken the initiative to organise together with the European Confederation of Agriculture (CEA) a pan-European debate on new ecosocial, agricultural policies in the Council of Europe member States and in the reform-minded countries of Central and Eastern Europe. The event will take place in Strasbourg from 3 to 5 May 1990. Special emphasis will be given to the inter-relationship between agricultural policies and practices and the environment.

A survey has already been carried out by the Committee in member States on optimal relations between animal husbandry and the quality of the environment. Water and soil pollution by nitrates and phosphates appeared to be the main problems but nuisances from odour and air pollution caused by methane emissions from animal manure also gave rise to major concern. The Committee is now preparing a policy framework for the solution of pollution in agriculture to be proposed to European governments and the Community.

A new initiative has been taken by members for the conservation of healthy fish stocks in European rivers and lakes. Many species are today threatened with extinction because of human interaction with their habitats. The main cause is water pollution. The construction of dams has also had a negative effect on fish fauna by interrupting the life-cycle of migratory species.

Forests play an important role in binding carbon dioxide from the atmosphere. In Resolution 919 (1989) the Assembly called on European governments to do more for forestry development. The use of wood in well-preserved constructions will reduce carbon dioxide in the air. At the same time more forests offer a larger habitat for European wildlife. ■

Since the 1960s, the Committee on the Environment, Regional Planning and Local Authorities has been the driving force behind most of the measures taken in the Council of Europe area to protect the natural heritage and combat pollution. In 1989 the committee gave an undertaking favourable to the continuation – in appropriate forms – of the campaign for the countryside. It expressed, among other ideas, its wish that the problems addressed by the campaign would remain on the agenda of its competent sub-committees.

In the course of the May session, one of the committee's reports described the current state of European policy with regard to the environment. It discussed both the development of national policies and the activities of the European and international organisations. There was a special chapter on environmental problems in Central and Eastern Europe. In the autumn of 1990 it is planned to organise a pan-European parliamentary conference to discuss the major ecological problems and their implications for East-West European co-operation. Preparations for this conference are going forward with the active participation of the members of the delegations from the countries of Central and Eastern Europe having special guest status with the Parliamentary Assembly. ■

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