

Bio News



No. 10 - April 1997

A newspaper for the appreciation and protection of the bio-environment, a shift from an anthropocentric to a biocentric vision

Bio-Peace for the Millennium

Bios may serve as a lever to lift the spirit of the world

Rising from the ashes a biocentric vision for Chernobyl



On the occasion of the 11th anniversary of the Chernobyl disaster, Ukraine has undertaken a series of initiatives to search for ways of overcoming current difficulties and securing a brighter future. In this crucial period of transition, decision-makers and government representatives have considered Biopolitics and the Biopolitics ideals as capable of providing Ukraine with the necessary models for change. As a result, the B.I.O. was called upon April 14-17, 1997 to elaborate on the implementation of biocentric concepts in Ukraine, in order to ensure economic and societal development that respect the environment and improve quality of life, on a long-term basis. In a series of discussions

with members of parliament, in Kiev, and at a conference held in Slavutich, with Biopolitics as the governing theme, it was possible to elaborate on an action plan that would enable Ukraine to exit the present crisis, through the pursuit of biocentric endeavours.

Slavutich, the city adjacent to the Chernobyl Power Plant, and, hence, most affected by a potential shutdown, is in dire need of attention. It is therefore essential to promote employment opportunities that will guarantee the development of the region and will also take advantage of the available infrastructure, in an effective manner. Within this framework, the initiative to turn Slavutich into a university town could not be

more timely. The B.I.O. International University for the Bio-Environment (I.U.B.E.) Visiting Scholars Programme would be a very good first step in this effort and could prepare the ground for more extensive academic development in the future. Furthermore, the evolution of Slavutich into a "biopolis" model, where every endeavour would be geared towards environmental appreciation, can help restore confidence in the population, and promote constructive and productive enterprise.

Chernobyl, a place of destruction, can serve as a powerful model to help society acknowledge the importance of embracing biocentric values and preserving bios on our planet. Like a phoenix rising from the ashes, Chernobyl can be reborn. A biocentric vision can help create a balanced society, with the appropriate legal framework to support both technological progress and environmental protection. On the wings of the phoenix, messages of hope can resonate across the entire planet.

World Referendum a new pathway for democracy

In the next millennium, the issue of bios will grow in complexity. More than just the appreciation and protection of the bio-environment, in all its varied manifestations, humankind will have to confront fundamental moral, legal and political dilemmas, resulting from cumulative advancements and changes. The urgent task ahead is to be aware of these challenges, and be morally and mentally prepared to face the uncertainties ahead.

For this crucial task to be successful, it is essential to have global participation. Presently, even in democratic regimes, citizens rarely speak out as a majority and are often overshadowed by the presumptuous attitudes of arrogant minorities. Current breakthroughs in the field of communication technology can provide the opportunity for the public to be actively involved in issues concerning our daily lives and be able to cast a vote, anytime, through computer networks and other communication link-ups, which can make immediate feedback possible from any corner of the globe. A *World Referendum* on the commitment to protect the bio-environment can be the manifestation of such an attempt, with many more dimensions to follow. These dimensions can open up new pathways for a *participatory democracy*, where opinions will be actively expressed and politicians will no longer be able to evade their responsibilities.

In order to avoid a robot-like, mechanistic society, human creativity needs to be channelled towards an inspired and productive "renaissance." Technology, coupled with a sound system of values, provides ample opportunities for growth and can lead to the blossoming of the human spirit. As we are traversing an electronic era, telecommunications will inevitably shape the future of our society. It is therefore imperative that we apply the full potential of these new tools to guarantee a society made up of responsible and affected citizens.

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Bios Olympiad

The B.I.O. is convinced that the future belongs to the young. The B.I.O. has also been among the first to point out the multilateral nature of environmental protection. In celebration of the new millennium and in the spirit of "bio-culture," a concept that stresses the complementarity between human culture and the bio-environment, the B.I.O. will be holding the First Bios Olympiad, in January 2000.

By bringing together all fields of human endeavour to rejoice in the gift of bios, the goal of the First Bios Olympiad will be to set the pace for a millennium of hope, peace and the harmonious co-existence of all forms of life.

Bios Prizes

We are on the threshold of a new millennium. In order to overcome the crisis of values in modern society, brought on by severe environmental deterioration, a new order of priorities is essential. Everyone has to take action if we are to reverse negative trends and ensure the harmonious coexistence of all forms of life. Humanity is wasting time. Solving environmental problems requires a dynamic approach, combining past experiences and present opportunities to establish new, enriched models for the future.

In October 1996, the B.I.O. awarded Commander Jacques-Yves Cousteau the First Bios Prize, in recognition of a millennium achievement in environmental protection. Commander Cousteau was not just the first, but also the only Bios Prize recipient for this century, emphasising the enormous impact of his work and his status as a pathfinder and a pioneer. On the eve of a new millennium, it is essential to start promoting environmental achievements, in every field of human endeavour, with the goal to award Bios Prizes on a regular basis, in as many fields as possible.

This has been one of the major B.I.O. aims, since 1992, when, the B.I.O. suggested the enrichment of the Olympic Games with biocentric values and proposed the award of Bios Prizes to individuals or institutions that have made a significant contribution to environmental appreciation and preservation. Furthermore, the B.I.O. has been making motions for global cease-fire during the Olympics, an initiative that was adopted as a UNA resolution, in 1994.

The International University for the Bio-Environment (I.U.B.E.)

To reach a new state of the world, education is key. An integrated biocentric education, that secures life-long environmental literacy for every citizen in the world, is a necessary vehicle for the successful furtherance of a global appreciation of bios. Bearing in mind that universities should be, by definition, "universal," the I.U.B.E., launched by the B.I.O. in 1990, promotes a model bio-education, by introducing environmental concepts to all academic disciplines. The I.U.B.E., which is primarily responsible for the global dissemination of the B.I.O. goals (p.2), is based on a Visiting Scholars Programme, whereby educators and decision-makers, from around the world (p.14-15), promote biocentric concepts in current educational curricula. The aim is for the I.U.B.E. to become a world-calibre initiative for the development of multidisciplinary environmental concepts, beyond the confines of conventional environmental science, leading to a revised educational system for the entire planet.

The I.U.B.E. in Budapest

To facilitate the above plans, the B.I.O. has recently established an I.U.B.E. branch in Budapest, Hungary. The purpose is to launch a pilot programme in "Bio-Diplomacy and Bio-Business" consisting of vocational training lectures and seminars, for public administrators and business executives. This programme will be officially launched in Budapest in August 1997, with the participation of the Fletcher School of Law and Diplomacy and other prestigious institutions. A separate lecture series for students is also being planned.

Goals of the B.I.O.

International co-operation for the better understanding and appreciation of bios (life) and the bio-environment. The bio-environment recognises no ideological or geographical boundaries, no East-West, North-South or developed-developing countries. Bios provides the unifying force for the harmonious co-existence of all forms of life, leading to a new era of bio-diplomacy.

International legislation on Bios Rights. It is important to protect all forms of life by enacting rules that prevent the deterioration of the bio-environment, and ensure the fundamental right to a clean environment and to a better quality of life.

Bio-culture - Bio-environment. Two essential dimensions for building new societal values for the next millennium.

Promotion of bio-education through the International University for the Bio-Environment. The International University for the Bio-Environment was launched in order to reform education world-wide, and promote a biocentric curriculum on every educational level.

Bio-assessment of technology. A diachronic search for new societal values that will channel technological progress in a direction that leads to a better quality of life through the appreciation of the bio-environment.

Raising public awareness of the ramifications of the biological sciences. in order for more people to realise that progress in the biological sciences relates to their own field of interest. This acknowledgement may lead to new fields of human endeavour, such as bio-legislation, bio-medicine, bio-ethics, bio-arts, bio-linguistics, bio-economics, bio-athletics, bio-communication, bio-history, bio-education and bio-diplomacy.

International Campaign for Environmental Olympics and Bios Prizes. The Biopolitics International Organisation has been proposing the introduction of cease-fire during the Olympic Games, a proposal which has recently been incorporated as a United Nations Resolution. In order to promote the bio-assessment of technology and a global bio-culture for the new millennium, B.I.O. proposes the establishment of international committees in every field of human endeavour, assigned with the responsibility to assess progress in their respective fields. Bios Prizes in every discipline will be awarded every four years, at the time the Olympic Flame is lit, to individuals or institutions that have contributed to the preservation and appreciation of the bio-environment.

Action is crucial in order to apply technological progress towards preserving the bio-environment. It is therefore essential to:

develop a **bio-syllabus** and new curricula for every level of education, as well as audio-visual materials on issues related to bios and the bio-environment

introduce a positive feeling of self-respect in the unemployed by paying a **Green Salary** instead of benefits, with the commitment to work for the protection of the bio-environment

encourage a **clearing-house** for individuals and organisations to provide, through the use of computer link-ups, a network of people wishing to co-operate on the promotion and appreciation of bios

generate **environmental action groups** drawing both from the enthusiasm of the young and the experience of senior citizens, to tackle local issues

encourage a **bios-supporting economic strategy** to replace destructive policies, and promote a world-wide interdisciplinary exchange of information on the appreciation of the bio-environment

promote the establishment of a computerised **Bank of Ideas** in which scientists, scholars and philosophers, as well as any interested party, may bequeath their thoughts and create a rich depository of information and reflections on bios

organise a **World Referendum** to allow for people throughout the world to express their willingness to preserve bios on our planet

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Progress

- * Television interview at WNYX, New York, USA
- * Biopolitics featured in the documentary "Morality as a basis for overcoming the crisis in Ukraine," a major Ukrainian production on the occasion of the 11th anniversary of the Chernobyl catastrophe
- * Opening address, conference on "Perspectives on sustainable ways of living," Olomouc, Czech Republic
- * Lecture, Hungarian Academy of Sciences, Budapest
- * Recipient of the Lions Club "Athena" award
- * Closing address, Second World Conference of the Centre for Hellenic-American Friendship, Athens
- * Weekly B.I.O. articles in the Athenian daily *Adesmeftos*
- * Weekly B.I.O. articles in the New York daily *National Herald*
- * Monthly B.I.O. articles in the *Greek Business Journal*
- * The B.I.O. President is appointed Corresponding Member of the Pontifical Academy of Life
- * Participation in the Pontifical Academy of Life Third General Assembly, The Vatican
- * Lecture, Aegean University, Chios, Greece
- * Lecture, Panhellenic Union of Biologists Conference, University of Athens
- * Biopolitics as the governing theme, conference on "Morality as a basis for overcoming the crisis in Ukraine," on the occasion of the 11th anniversary of the Chernobyl catastrophe, Ukraine
- * Series of meetings with Ukrainian members of parliament and discussions on biocentric initiatives for Ukraine
- * Lecture, WREMINSECO '97 Conference, Sofia, Bulgaria
- * The B.I.O. President is appointed "Doctor Honoris Causa" by the Council and Rector of D.I. Mendeleev University of Chemical Technology of Russia
- * "Danube River Bonds: Bio-Environment - Bio-Culture," conference organised in co-operation with City University Bratislava, Bratislava, Slovak Republic
- * Series of lectures on biodiversity and bio-culture, Skopelos, Greece
- * Quarterly publication of *BioNews*, the official B.I.O. newspaper
- * Bio-ethics, bio-economics, bio-legislation, bio-diplomacy, and bio-philosophy featured extensively on the B.I.O. Internet web site (<http://www.hol.gr/bio>)

EDITORIAL

Biopolitics: moving beyond sustainable development



Dr. Agni Vlavianos-Arvanitis,
B.I.O. President and
Founder

To sustain, according to the Oxford Universal Illustrated Dictionary, means to keep in being; to cause to continue in a certain state; to keep up; to maintain the status of. Sustainable development, therefore, implies the continuation, the keeping up and the maintenance of the status of the present situation. But is that what society needs, on the threshold of a new millennium?

With new challenges constantly arising and with an increased awareness of the urgent need to take action against destructive trends, the time is ripe to find more comprehensive, long-term solutions to protect our planet and guarantee a balanced society for the future. A new vision, beyond sustainable development, can help place the situation in perspective, and provide the necessary incentives to move ahead and explore possibilities leading to more just and safe global management.

Immediate action is of the essence. By the time reforms and revisions are approved, they tend to be already outdated. Loss of biodiversity, destruction, war, exploitation of the poor, unequal distribution of resources and trade methods that increase the dept of developing nations require a prompt and radical solution. Long-term objectives for the implementation of global policies, such as fostering peace, developing human resources, curbing financial inequality and promoting strategies for eliminating world disparities have to become the number one priority in the 21st century.

Society resembles an inverted pyramid and is in danger of collapsing. Anthropocentric attitudes and oversight are seriously jeopardising the welfare of future generations. The time is ripe for society to acknowledge that, in addition to "human rights," there exists a series of "human obligations," and it is our common responsibility to preserve the environment and improve quality of life, on a global level.

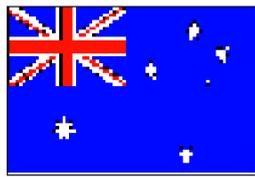
It is therefore essential for international legislation to make explicit reference to environmental protection and for current environmental acts to be expanded upon and re-evaluated. It is also essential for bios rights to function as a priority in the development of judicial codes, on issues involving the rights of future generations, and for our obligations and responsibilities as human beings on this planet to be emphasised. Bio-environmental considerations should become one of the determining, if not decisive, factors of decision making at every possible level. Being exclusively preoccupied with human rights, at the expense of the environment, is not a viable option. Once we acknowledge our responsibilities and assume appropriate action, securing our rights will follow as a direct consequence.



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Water resource conservation in Australia

The New South Wales Environmental Protection Agency

Water resources are of major environmental, social and economic value to NSW. If water quality is not maintained, it is not just the environment that will suffer - the commercial and recreational value of water resources will also diminish. A range of programmes to improve water quality is under way. The NSW Government participated in developing the National Water Quality Management Strategy (NWQMS). This strategy provides a framework for action and a series of guidelines and scientific criteria that will help improve water quality.

The NSW Government's water reform package among other things is establishing water quality objectives for each catchment in New South Wales. The objectives will use the method developed by the NWQMS. The NSW Government also has established other processes to co-ordinate water quality management programmes across all State Government agencies. The EPA is involved with the following key initiatives:

- ◆ providing information to the public on the quality of water through the Beachwatch, Harbourwatch and Hawkesbury-Nepean water quality programmes and the State of the Environment reports.
- ◆ developing environmental education programmes that help the community understand how their actions affect water quality
- ◆ supporting total catchment management programmes, as well as providing financial resources to communities through grant programmes such as the Environmental Trust
- ◆ developing pollution reduction programmes and regulating industrial activities, as well as controlling diffuse sources, to prevent water pollution
- ◆ working with the community to tackle difficult water quality problems such as stormwater pollution and urban runoff

Coastal zone pollution

The New South Wales coastline is a dynamic area of high sensitivity, 1900 kilometres long with about 700 beaches and 331 estuaries. Human intervention has modified natural processes along the coast and greatly influenced the stability of beaches, often with adverse long-term effects.

Coastal ecosystems, both fragile and vulnerable, are of major environmental and economic importance to NSW. They enhance a wide range of economic and recreational activities, and provide a necessary ecological balance. Protection of the coastal environment is critical to the State's continued productivity.

A large proportion of the pollutants which reach the marine environment originate on land. Coastal outfalls discharge directly to estuaries, inshore waters, bays and open coastal waters. Urban stormwaters is also a significant source of pollution and finds its way into coastal waters via drains. Studies have found that water quality declines after wet weather, and there is a dramatic increase in bacteria levels. In some cases rivers can be regarded as major sources of pollution of coastal waters, as they collect, carry and discharge wastewaters to the ocean from different sources within their drainage basins.

Coastal waterways are also affected by pollution from other areas which is difficult to pin-point. Sources can include surface run-off from urban and rural areas (which often contains pesticides, fertilisers, herbicides and soil particles), seepage from septic systems and boating activities. This type of pollution, which is largely dependent on management practices, cannot be linked to specific locations.

According to a recent study, there are about 200 stormwater outlets discharging to coastal waters between Palm Beach and Cronulla. The quality of the urban run-off from each catchment was poor. Faecal coliform counts in dry weather discharges from the Whale Beach, Greendale Creek and Bondi catchments exceeded the Clean Waters (CWA) Act Regulation 1972 limit in more than 98% of samples. The limit was exceeded in 44% of the dry weather samples from the Beach catchment and in 11% of those from Malabar. Because dry weather flows are low and total loads small, these poor quality discharges may not be apparent in nearby bathing water. During wet weather most pollutant concentrations were equal to or higher than those in dry weather. Faecal coliform counts were greater than the CWA limits in all samples from Whale Beach, Greendale Creek, Bondi and Malabar. At Shelly Beach, the median daily discharge of total phosphorus and ammonia increased while at the same time the discharge of total nitrogen decreased.

There are 31 ocean sewage outfalls along the NSW coastline. Eight of these discharge tertiary treated effluent, 16 discharge secondary treated effluent and seven discharge effluent that has received only primary treatment. The Sydney region is served by five major sewage treatment works with ocean outfalls at Malabar, North Head, Bondi, Cronulla and Warriewood.

Since 1993, untreated sewage sludge has

only been released onto the ocean when there has been a breakdown at a treatment works. At the Malabar treatment plant in Sydney and the Burwood Beach plant in Newcastle, sludge disposal to the ocean has been approved as an interim measure while alternative sludge management facilities are being constructed.

Industrial discharges

Industrial discharges to coastal waterways are licensed by the EPA and strict limits are set for concentrations of major contaminants, including arsenic, cadmium and lead.



Dredging

Dredging in estuaries affects the environment in a number of ways. These include alteration of tidal levels and the loss of fish nursery areas such as seagrass beds.

Dredging in Botany Bay has severely reduced the extent of seagrass beds. On the northern shores of the bay, seagrass

beds were overriden by dredge spoil during construction of the Foreshore Road. On the southern shores between 1977 and 1988, seagrass beds were eroded during severe storms. Channel dredging was believed to have caused an increase in the height of storm waves.

Dredging in estuaries often involves the disturbance or removal of chemically contaminated sediments. A study by the EPA during dredging of Port Kembla Harbour showed that concentrations of major contaminants, including zinc and cadmium, exceeded maximum levels recommended

for the protection of the aquatic environment. The study suggested that some filter- and deposit-feeding organisms might be bioaccumulating trace metals.

The ocean dumping of dredge spoil, whether contaminated or not, is licensed by the Commonwealth under the Environment Protection (Sea Dumping) Act 1981. In NSW almost all material approved for dumping at sea is dredged material. Spoil is analysed for contaminants before permission is granted. Between 1984 and 1991, approval was given for over eight million tonnes of dredged material to be dumped off the NSW coast. Maintenance dredging of the major harbours and work on the Sydney Harbour Tunnel accounted for almost 90% of this material.

Oil spills

Environmental monitoring by the State Pollution Control Commission in 1979 and 1980 indicated that ocean dumping near Five Islands of Port Kembla was adversely affecting an area of ecological and recreational importance. As a result of this finding, the spoil disposal site was moved to a new location. Between 1973 and 1980 this area received 13.4 million tonnes of dredge soil from Port Kembla Harbour. Disposal of spoil at the new site has minimised ecological impacts on the Five Islands area.

In NSW over the last decade there has been an average of over 150 oil spills in the coastal zone each year. However most of the spills have been minor, with only small volumes of oil involved. Between 1980 and 1992 there were two major oil spills in Sydney Harbour and Botany Bay, involving between 30,000 and 150,000 litres of oil.

Ballast water

The amount of crude oil transported in NSW waters has been increasing steadily and the potential for the occurrence of a major oil spill has been of concern. In view of this, the NSW Government, under a Commonwealth programme, has developed a series of atlases which provide guidance in dealing with the effects of a spill.

In NSW a number of studies have revealed that ballast waters, transported into and discharged in Australian ports and coastal environs, have probably been responsible for the introduction of exotic fish, invertebrates and toxic algae.

Boating

The Australian Quarantine Inspection Service routinely samples the ballast waters of vessels entering Australian ports. Action is primarily focused on prevention on a national programme basis, through quarantine action and restrictions on discharging.

A major contaminant used in marine paints to kill barnacles, algae and other organisms on boats is tributyltin (TBT). TBT is toxic to larval forms of marine life and causes shell thickening and studded growth in several species of marine vertebrates and invertebrates. Investigations in Sydney Harbour and the Georges River showed relatively high concentrations of TBT in areas of high boating activity. A 1989-90 study at 28 sites along the NSW coast showed high levels of abnormalities in two species of sea snails where boating was moderate to high. A 1988 study has also drawn an association between high TBT concentration and shell deformities and reduced tissue weights in Sydney rock oysters.

In March 1989, the NSW Government banned the use of TBT-based paints on vessels of less than 25 metres and placed stringent conditions on its use on longer boats.

Washing your car without polluting the environment

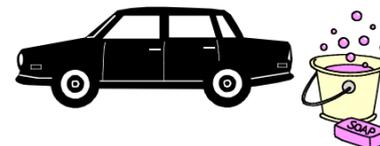
Some helpful tips provided by the New South Wales Environmental Protection Agency

Where to wash your car

1. Try to wash your car on a grassy area to minimise the runoff.
2. Wash your car in the driveway if it drains onto a lawn or garden area, but avoid using the driveway if the water runs into a street or drain.
3. Always ensure the area where you wash your car does not drain into the stormwater system, including the drains in the street.
4. If you have no suitable area to wash your car, look for an alternative location - perhaps your friends or neighbours have a suitable area you can use.
5. Some service stations provide an area for car washing, where runoff water is treated to remove pollutants before it goes into the sewer.

When you wash your car

1. Use a trigger hose - or even better, a bucket - to save water.
2. Use detergents and soaps sparingly.



Better still, just use plain water, a coarse sponge and a little elbow grease.

3. Dispose of waste water onto a garden or lawn.
4. Consider washing your car only once a month.

Commercial car wash premises treat waste water before disposing of it in the sewer. But remember, a commercial car wash uses far more hot water and soap than hand washing. There are also some newer commercial car washes which clean, recycle and reuse water in their 'do it yourself' car wash bays. These systems use much less water than standard car wash premises and all waste water is treated before disposal.

PROGRAMME

OPENING CEREMONY

• The Honourable **Peter Kresanek**, Mayor of Bratislava, Slovak Republic • The Honourable **Ladislav Cingel**, Mayor of Dunajska Luzna, Slovak Republic • The Honourable **Rudolf Schuster**, Mayor of Kosice, Slovak Republic • **Dr. Agni Vlavianos-Arvanitis**, President and Founder, Biopolitics International Organisation, Greece • The Honourable **Alexei Paladi**, Deputy Mayor of Chisnau, Moldova • **Ambassador Kai Falkman**, Ministry of Foreign Affairs, Sweden • **George Zavvos**, Ambassador of the European Union to the Slovak Republic

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BIO-DIPLOMACY AND BIO-ETHICS: LESSONS FROM HISTORY

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EVOLUTION OF A RIVER: BIODIVERSITY, HISTORY AND CULTURE

• *Agro-environmental policies in Germany*, **Professor Klaus Frohberg**, Director, Institute of Agricultural Development in Central and Eastern Europe, Germany • *The importance of the Danube in Slavonic history*, **Valery Evorovsky**, Research Fellow, Belarus Academy of Science • *The role of historical rivers in human civilisation*, **Mykola Sappa**, Kharkiv State University, Ukraine • *Human settlements in the Danube basin and the environment*, **Professor Alexander Reteyum**, Moscow State University, Russia • *The communicative differentiation of natural and cultural diversity in the Danube area*, **Zlatica Plasienkova**, Faculty of Philosophy, Comenius University of Bratislava, Slovak Republic • *The stream of evolution and the evolution of rivers*, **Dr. Igor N. Malakhov**, Head of Council, National Ecological Centre of Ukraine • *Fauna and flora biodiversity in the Bulgarian sector of the Danube*, **Dr. Svetoslav Gerasimov** and **Ivan Yanchev**, Institute of Ecology, Bulgarian Academy of Science, Bulgaria • *Rivers versus urban development - front or back orientation?* **Dr. Wojciech Kosinski**, University of Krakow, Poland • *Danube forest ecosystems: biodiversity changes in the 20th century*, **Julius Oszlanyi**, SAV, Slovak Republic • *Biodiversity in the Yugoslav sector of the Danube*, **Professor Ivica Radovic**, Faculty of Biology, University of Belgrade, Yugoslavia • *Water resources and the development of human civilisation*, **Zoran M. Radic**, Faculty of Political Sciences, University of Belgrade, Yugoslavia • **Dr. Vitalij Gulca**, Department for Environmental Protection, Moldova

BIO-EDUCATION AND ACADEMIC POLICY

• *Research education centre: a new level of bio-education in Russia*, **Rector Pavel J. Sarkisov** and **Professor Michael N. Manakov**, Mendeleev University of Chemical Technology, Russia • *Environmental science and policy: a new step in environmental education in Ukraine*, **Dr. Pavel Zamostian**, National University "Kiev-Mohyla" Academy, Ukraine • *The symbolism of water in the borderline analysis of philosophical anthropology and aesthetics*, **Professor Maria Golaszewska**, Jagiellonian University in Krakow, Poland • *Environmental education on the way to new thinking*, **Olga Musikhina**, Director, Business Technical Assistance Centre, Russia • *Biodiversity and quality of life: a philosophical approach*, **Alexandra I. Szewczyk**, Poland • *Interdisciplinary environmental education as a complex science for the next millennium: experience and visions*, **Dr. Alexander Lutsko**, Rector, International Sakharov College on Radioecology, Belarus

DANUBE RIVER BONDS
BIO-ENVIRONMENT - BIO-CULTURE

Past, Present and Future

CITY
UNIVERSITY
BRATISLAVABIOPOLITICS
INTERNATIONAL
ORGANISATIONJune 3-6, 1997
Bratislava, Slovak Republic

The common heritage of mankind and the new concepts of responsibility

Professor **Rusen Keles**
Director
Centre for Environmental Studies
Ankara University, Turkey

The common heritage of mankind is one of the most pronounced concepts of modern environmentalism. Its scope has been steadily widening and its protection is gradually becoming the subject of environmental ethics and international environmental law, at the same time. However, depending upon its definition and different ethical approaches, the importance attributed to the concept of common heritage changes. The variable character of the concept is further complicated by the nature of the

responsibility towards its protection and development.

International Environmental Law is still far from having concrete rules to ensure the proper defence of the common heritage of mankind. The protection and utilisation of transboundary watercourses is one of the most important tasks in our community.

International Environmental Law is still far from having concrete rules to ensure the proper defence of the common heritage of mankind. The protection and utilisation of transboundary watercourses is one of the most important tasks in our community.

Upper riparian States often interfere with the flow of watercourses in various ways and distort the environmental balance through pollution, thus disregarding their international responsibilities. It is therefore essential to review the concepts of common heritage and responsibility, and to

emphasise the need for bilateral and multilateral efforts to protect the common heritage of mankind.

Environmental governance for
Management of transboundary freshwater bodies in a manner
and politically acceptable poses a

Dr. **Juha I Uitto**
Academic Officer
The United Nations University, Tokyo, Japan

There are numerous rivers, such as the Danube, that are shared by two or more countries. Management of transboundary freshwater bodies in a manner that is environmentally sound, as well as socially, economically and politically acceptable poses, a challenge to the international community. The issues involved are complex and cover both quantity and quality of water for competing uses, including water supply, industry, agriculture, energy production, navigation, recreation, and ecosystem needs.

Governance refers to the complex set of values,

norms, processes, and institutions by which society manages its development and resolves conflict, formally or informally. It involves the State, but also civil society at the local, national, regional and global levels. For environmental governance, it is necessary to develop international legal instruments and mechanisms that set the rules for dealing with the various issues. In Chapter 39, the UN Agenda 21 called for the

review and development of international environmental law in order to evaluate and to promote the efficacy of that law, and to promote the integration of environment and development policies through effective international agreements or instruments taking into account both universal principles and the particular and differentiated needs and con-

Water resources have been essential to the evolution of life and human civilisation and have played a crucial role in socio-economic developments. The Danube, one of the largest European rivers, traverses 10 nations (Germany, Austria, Slovak Republic, Hungary, Croatia, Yugoslavia, Romania, Bulgaria, Ukraine and Moldova) and influences the lives and livelihood of millions of people.

In view of the recent political transition most of these nations have experienced, the time is ripe to re-examine prospects for co-operation (based on the potential expansion of the European Union) and focus on the growth of commercial and cultural relations, using the Danube as a common point of reference. As the river itself has suffered serious deterioration due to environmental pollution, the development of long-term multilateral initiatives for its restoration and protection, as well as for a more thorough appreciation of bios, can bring all these nations together in a common cause.

The bio-environment has been the single most important correlation in human history and can successfully promote international co-operation and understanding. With the construction of a network for collaboration, the "Danube Countries" can come together in celebration of their culture and heritage. As the Danube flows from the Black Forest to the Black Sea, it carries messages of peace, hope and co-operation. Applying these messages to every endeavour can improve our quality of life and lead to a brighter future.

This conference will serve as a forum for the exchange of ideas on the importance of drawing lessons from history, with regard to the interactions among people living near the Danube, and using these lessons to build a harmonious future. With the implementation of biocentric principles as a governing theme, leaders in the fields of politics, diplomacy, science, academia and business will discuss the contributions their respective disciplines can make, and will propose models for new thinking and action.

Business co-operation among Ukraine and other Danube countries: environmental aspects

Dr. Stanislav Sokolenko

Chairman of the board

UKRIMPEX Joint Stock Company, Ukraine

On the threshold of a new millennium, humanity is faced with an environmental crisis. Human activity and technologies developed in the rush for instant profit have not always been constructive, and, more often than not, have been destructive, leading to changes in the biosphere and threatening bios on our planet. Safeguarding water resources is a vital task, not only of one nation, but of the entire world community. Ukraine, facing many severe environmental problems like air and water pollution, the after-effects of the Chernobyl disaster, etc., has become aware of their global consequences. In 1987, at the 42nd UN General Session, together with the former Czechoslovakia, Ukraine initiated a discussion on the development of a global ecological security system.

It is essential to develop new ways for Ukraine to exit the economic and environmental crisis. Bio-business and the introduction of clean and environmentally compatible technologies is, therefore, a priority.

Environmental awareness is an integral part of the development of bio-culture, bio-education, bio-policy, bio-management, and other bio-concepts, which are important for the establishment of mutually beneficial international co-operation among the "Danube countries." Much attention is given to biolaw, legislation, water and environmental management, and waste processing and utilisation problems. Environmental factors are extremely important for the future development of the agricultural potential of Ukraine. The Danube is the main source of water supply to southern Ukrainian fields, currently suffering from water deficiency. It is essential to develop new ways for Ukraine to exit the economic and environmental crisis. Bio-business and the introduction of clean and environmentally compatible technologies is, therefore, a priority.

transboundary water resources

that is environmentally sound, as well associatively, economically challenge to the international community.

cerns of all countries.

Considerable work has gone into developing international governance mechanisms and legal instruments for the management of transboundary water resources for non-navigational uses. A global water convention is still not finalised. The reasons for this are both technical and political. A basic question concerns the sovereignty of countries over their natural resources. Another main issue, especially in developing and newly industrialised countries, is the right to development vs. environmental protection. Several fairly successful cases of basin-wide treaties and agreements of co-operation can nevertheless be found in the world, ranging from the Danube, through the Nile, to the Mekong. These can be utilised as a basis for seeking broader understanding of the global governance mechanisms.

The United Nations University project on Hydropolitics and Eco-political Decision-making aims at a comprehensive and objective study of water as a limiting factor for regions sharing major international water bodies, in view of providing bases for sustainable environmental and political management of critical resources. The project aims to identify the issues in dispute concerning water resources, select alternative scenarios that could lead to the solution of complex problems related to water and the environment, and recommend processes through which the concerned countries are likely to agree on mutually satisfactory solutions to the problems, by sharing resources and benefits. One of the studies under the project is concerned with the disputed case of the Gabčíkovo-Nagymaros Barrier System in the Danube, between the Slovak Republic and Hungary.

PROGRAMME, cont.

WATERWAYS AND WATERWORKS:

INTERNATIONAL CO-OPERATION AND CONFLICT RESOLUTION

- *Hydropolitics and conflict resolution: lessons from the Colorado, Indus, Nile, Jordan, Euphrates, and Danube*, **Professor Masahiro Murakami**, Department of Infrastructure System Engineering, Kochi University of Technology, Japan
- *Conflicts of interest*, **Vladimir Holcik**, Research Institute, Slovak Republic
- *The Gabčíkovo-Nagymaros dam: social, political and cultural conflicts*, **Miklos Sukosd**, Department of Political Science Central European University, Hungary
- *Environmental governance for transboundary water resources*, **Dr. Juha I. Uitto**, The United Nations University, Tokyo, Japan
- *Philosophy of river problems: local to regional, static to mobile*, **Libor Jansky**, Comenius University of Bratislava, Slovak Republic
- *Waterworks of Danube tributaries*, **Jan Hummel**, Department of Government Commissioners, Slovak Republic
- *Possibilities for an optimised operation of the Gabčíkovo-Nagymaros hydropower system*, **Professor Imre Nagy**, Hungary
- *Monitoring the Gabčíkovo waterworks*, **Jan Vincent**, Department of Government Commissioners for the Slovak Republic
- *The fifth dimension of the Gabčíkovo waterworks*, **Julius Binder**, Department of Government Commissioners, Slovak Republic
- *Autonomous environmental policy in the Carpathian Basin*, **Dr. Gyula Bora**, Budapest University of Economic Sciences, Department of Economic Geography, Hungary
- *Monitoring the Gabčíkovo waterworks region*, **Dr. Gabriel Niznansky** and **Dr. Milan Matuska**, Ministry of Environment and Slovak Hydrometeorological Institute Bratislava, Slovak Republic
- *Implementation of the Danube environmental programme in the Slovak Republic*, **Dr. Ivan Zavadsky** and **Dr. Milan Matuska**, Ministry of Environment of the Slovak Republic
- *Present activities of the Danube environmental programme*, **Professor Teun Botterweg** and **Jozef Turcan**, Danube PCU Vienna, Austria
- *Daugava: hydroenergy and ecology*, **Dr. Dainis Ivans**, Latvian Academy of Culture, Latvia
- *Environmentally sound hydro-electric power projects*, **Tibor Harosi**, Renewable Energy Club, Hungary

CURRENT CONCEPTS IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

- *Water resource model: environmental management and future biopolitics principles*, **Professor Alexander Shishkin**, Department of Ecological Standardisation, St. Petersburg State Technological University for Plant Polymers, Russia
- *Environmentally sustainable hydropower developments for the 21st century*, **Professor Emil Mosonyi**, President, International Hydropower Association, Germany
- *Benefits and risks of today's science and technology: how is the Danube affected?* **Dr. Ivana Djujic** and **Dr. Borivoje Djujic**, Centre of Chemistry, Belgrade, Yugoslavia
- *Nuclear power stations on river banks: economic profit or deadly hazard?*, **Irina Proskina**, Centre of Nuclear Ecology and Energy Policy for Socio-Ecological Union, Russia
- *Eutrophication in the Cunovo reservoir*, **Dr. Jarmila Makovinska**, Water Research Institute, Slovak Republic
- *Reducing phosphorus loading in the Danube Basin*, **Professor Istvan Ijjas**, Department of Water Resources Engineering, Budapest University of Technology, Hungary
- *Pollution sources and groundwater quality in the coastal region of the Yugoslav part of the Danube*, **Dr. Snezana Komatina**, Geophysical Institute Belgrade, Yugoslavia
- *Fish biodiversity of the Gabčíkovo waterworks*, **Anton Kirka**, Department of Government Commissioners, Slovak Republic
- *Implementation of the IUCN-Steppe-Project in Ukraine*, **Oleg Derkach**, Deputy Director, Institute of Ecology, South Branch of the National Ecological Centre, Ukraine
- *Danube river quality along the Bulgarian stretch*, **Christina Mateva-Dontcheva**, Assoc. Professor, "EKOMAT" Consulting Co, Bulgaria
- *Free radicals in biology and environmental science*, **Professor Alexander Tkac**, Faculty of Chemical Technology, Institute of Physical Chemistry, Slovak Technical University, Slovak Republic
- *Environmental pollution: a psychologist's standpoint*, **Dr. Svetlana E. Gabidulina**, Moscow Linguistic University, Russia
- *Bio-culture and nature protection in Hungary*, **Dr. Istvan Major** and **Dr. Karoly Szoke**, Institute for Environment Management Service for Nature Conservation, Budapest, Hungary
- *Restoration of the Morava river continuum*, **Professor Otakar Sterba** and **Dr. Borivoj Sarapatka**, Department of Ecology, Palacky University Olomouc, Czech Republic
- *Biopolitical problems of large-scale hydrotechnical construction*, **Professor Victor D. Romanenko**, Director, Institute of Hydrobiology, National Academy of Sciences, Ukraine

FOREST ECOSYSTEMS AND SOIL PRESERVATION

- *Functional assessment of forests as recreational resources*, **Professor Edvardas Riepsas**, Agricultural Academy, Lithuania
- *Organic farming in the Baltic countries - social aspects of development*, **Dr. Aija Zobena**, Assistant Professor, Latvia University of Agriculture
- *Protecting soil resources in the Danube countries*, **Terezia Davidova**, Slovak Agency for the Environment
- *Soil protection working group of the Danube countries: tasks and results*, **Michal Dzatko**, Soil Fertility Research Institute Bratislava, Slovak Republic
- *Environmental importance of the forest ecosystems of the Danube*, **Ferdinand Kubicek**, Comenius University, Slovak Republic
- *Synecologic specialities for the natural revitalisation of forests*, **Professor Ladislav Somsak**, Comenius University, Slovak Republic
- *Quality of surface waters - the importance of maintaining stability in meadow ecosystems*, **Professor E. Bublinc** and **M. Dubova**, Slovak Academy of Science, Slovak Republic
- *The upper Danube national park*, **Dr. Hans-Christian Dosedla**, Germany

LEGISLATIVE NORMS IN WATER MANAGEMENT

- *Environmental NGO law*, **Alexei Shumilo**, "Eco Pravo-Kharkiv" Public Organisation, Ukraine
- *Blue alternatives for a blue Danube*, **Michal Kravcik**, "People and Water" Organisation, Slovak Republic
- *New trends in water protection and management*, **Jerrod L. Davis**, "People and Water" Organisation, Slovak Republic
- *Integrated ecosystems: a recent strategy for water management*, **Dr. Pavel Punochar**, T.G. Masaryk Water Institute, Czech Republic

PATHS TO BUILDING A CIVIC SOCIETY

DEMOCRACY AND CIVILISATION

- *Man in nature and the limits of sustainable development*, **Juraj Hrasko**, Soil Fertility Research Institute Bratislava, Slovak Republic
- *Quality of life and biopolitics*, **Dimitris Papanthassiou**, Chairman of the Board, Ippocrateion General Hospital, Greece
- *Global policy for the bio-environment*, **Professor Mihaly Simai**, Honorary President WFUNA, Hungary
- *Quality of life - what does it mean and is it improving or deteriorating in our time?* **Dr. Konrad Waloszczyk**, Technical University of Lodz, Poland
- *Biopolitics - beyond sustainability*, **Christos Efthimiopoulos**, Physicist, Biopolitics International Organisation, Greece
- *Peace and stability is connected directly with environment policy*, **Dr. Alfred Meiaiu**, Albanian Atlantic Association
- *Professor Leszek Kuznicki*, President, Polish Academy of Sciences
- *Bio-culture: non-violence and future quality of life*, **Professor Dragan Simeunovic**, Political Science Faculty, University of Belgrade, Yugoslavia

Forest ecosystems and soil preservation

Organic farming in the Baltic countries: social aspects of development

Dr. **Aija Zobena**
Assistant Professor
Department of Social Sciences
Latvia University of Agriculture

Along with structural changes, new farming practices have developed in the Baltic countries during the last few years. Ideas of organic farming* were introduced in the late 1980s. Today, in Latvia, about 200 farmers have converted their farms - a total of 1080 ha. - to organic or biodynamic farms. Moreover, the first "green labels" were just recently established. Estonia has approximately 119 ecological farms and, in Lithuania, organic farmers control 1117 ha. of land.

The aim of this study is to analyse the social aspects of development of organic farming and to evaluate the future prospects of such farming practices. First, the understanding of the concept of organic farming in the Baltic countries has been analysed and the position of organic farming among other alternative agriculture practices has been looked upon. Secondly, connections between organic farming and the agro-food chain have been addressed. Thirdly, the future prospects of the development of organic farming in the Baltic States have been discussed.

Analysis of organic farming as a farming style allows to draw some conclusions about its development and future prospects in the Baltic countries:

1. Organic farming, as a sustainable agricultural practice, offers the most radical solution to environmental problems in agriculture.

2. Organic farmers are very active in forming voluntary organisations.

3. State support for the development of organic farming in the Baltic countries is insufficient.

4. The support of organic farming from research and educational institutions is based on the enthusiasm of interested individuals.

5. Farmers' attitudes to organic farming in the Baltic countries in

Wide-spread organic farming practices in the Baltic countries could be beneficial to the further advancement of the agricultural sector and rural development in general. They could help produce high quality environmentally-friendly products, maintain traditional rural lifestyles and landscapes, and provide conditions for the development of eco-tourism in the Baltic region.

general are positive, but due to poor financial conditions some are unable to take up the practice.

6. Organic farmers have serious problems in marketing their products.

7. Wide-spread organic farming practices in the Baltic countries could be beneficial to the further advancement of the agricultural sector and rural development in general. They could help produce high quality environmentally-friendly products, maintain traditional rural life-styles and landscapes, and provide conditions for the development of *eco-tourism* in the Baltic region.

* The term "organic farming" is used as a synonym for organic as well as biodynamic farming. This does not ignore some conceptual and technological differences between these two agricultural practices, but focuses on their common objectives and common problems in marketing their products. In Latvia, the general term "biological farming" is used as a synonym for organic, as well as biodynamic farming. In Estonia the term "ecological farming" is used to express the same concept.

Functional assessment of recreational forest resources

Professor **Edvardas Riepsas**
Lithuanian Agricultural Academy
Kaunas region, Lithuania

Management methods in the forested coastlines, where forests

mainly have recreational functions (though water protection and anti-erosion functions are also important), could be

properly balanced using the evaluation methods prepared by the model presented here.

The four most important qualities for assessing recreational potential have been singled out: 1) aesthetic relevance 2) climate and environmental quality

3) topography 4) exploitation reliability. The key factors, determining aesthetic relevance, are spatial structure and diversity. Climate and environmental quality are determined by the qualitative and quantitative parameters of air and water, the ability of

Riparian forests mostly serve a recreational function, although their water protection and anti-erosion functions are also important.

plants to produce oxygen and ions, as well as by the presence of disturbing insects and the degree of pollution and environmental deterioration. The topography is used to determine forest accessibility, practicability and recreational infrastructure. Forest stability in the presence of recreational pressures, can be assessed using criteria of maximally allowable load.

Waterways and waterworks

International co-operation and conflict resolution

International rivers, hydropolitics and conflict resolution

Professor **Masahiro Murakami**
Department of Infrastructure System Engineering, Kochi University of Technology Japan

There were 214 international rivers and lake basins covering 47% of the land area in the world, in 1978. After the end of cold war in 1989, there are more international rivers in the regions of

Eastern and Central Europe, with some fears of increasing potential conflicts among the riparian States. Intensive river development had significant influence and/or adverse effects on the water and ecosystem balance, not only along the rivers, but, also in the inland and/or coastal deltas. Not much attention was paid to solving the increasing potential conflicts over international waters and the creeping environmental problems, and time is fast running out.

Not much attention was paid to solving the increasing potential conflicts over international waters, or the creeping environmental problems, and time is fast running out.

The study of hydropolitics and conflict resolution of international rivers aims to identify the issues in dispute, concerning water resources and the environment, select alternative scenarios, and recommend processes by which the countries concerned are likely to agree on mutually satisfactory solutions to the problems and proceed to sharing resources and benefits. In view of the advent of the 21st century, the study will also provide a comprehensive and objective environmental man-

agement setting for sustainable development, with or without international co-operation, by reviewing some lessons from the past. Riparian questions, concerning the Danube, would be compared with other major international rivers including the Colorado, the Indus, the Nile, the Jordan and the Euphrates, of which the cases could either successfully or unsuccessfully resolve the conflicts on hydropolitics and decision-making along the rivers crossing national boundaries.

Integrated ecosystems a recent strategy for water management

Dr. **Pavel Punochar**
T.G. Masaryk Water Institute, Czech Republic

"There is no life without water." The first article of the European Water Charter (Strasbourg, 1968) clearly states the basic importance of water, not only for economic and social development, but, also, for sustainability of life on the Earth. The principles of the Charter are continuously implemented, through environmental policy, by all developed countries. Later, the Rio de Janeiro Conference (1992) declared the urgent protection of water resources as an essential condition for the development of future generations. The integrated protection of water resources within the natural (hydrological) river basins represents the recent strategy for water management. This implies, *inter*

Restoration of biodiversity, as close as possible to the natural situation, is one of the main goals of watershed rehabilitation. Because of this, environmental research and programmes for protection and improvement of watercourse habitats form and integral element of water management action plans.

Based on the evaluation of river ecosystems, conservation, as well as other relevant improvement measures, are proposed.

alia, the application of environmental approaches, taking into account the fact that the state of and changes in water quality result from interactions between water quantity, biotic and abiotic factors, and habitat structure in the streams and flood-

plains. Accordingly, restoration of biodiversity, as close as possible to the natural situation, is one of the main goals of watershed rehabilitation. Because of this, environmental research and programmes for protection and improvement of watercourse habitats form and integral element of water management action plans. As an example, the experience from the environmental programme of the International Commission for the Elbe River Protection will be illustrated.

Based on the evaluation of river ecosystems, conservation, as well as other relevant improvement measures, are proposed.

The philosophy of river problems local to regional, static to mobile

Libor Jansky
Comenius University
Faculty of Natural Sciences
Bratislava, Slovak Republic

According to the statistics, thirteen of the twenty-five major river basins in Europe are transboundary river basins. The Danube river basin is the largest transboundary river basin in Europe. As a result, several local and regional problems arise, including division of fishing rights (or rights on river beds), rights to claim tolls on navigation, questions on how to adjust boundaries if the channel moves, rights to claim duty on crossing the river, building bridges, embankments, etc. On a larger scale, the above problems also include rights on non-contiguous lands (i.e. not fronting on the river), using the river for navigation and passage of migrating fish, and exploiting the river (e.g. bed sediments) with or without damage to

The Danube river basin is the largest transboundary river basin in Europe. As a result, several local and regional problems arise and are exacerbated by their superimposition on other non-river problems, e.g. religion, politics, historical issues, regional conflicts, relative prosperity issues, etc.

other countries. Similarly, pollution and large-scale removals of water cause problems on regional or national levels. Disputes arising from these problems are more or less exacerbated by their superimposition on other non-river problems, e.g. religion, politics, historical issues, regional conflicts, relative prosperity issues, etc. The dispute over the Gabčíkovo waterworks between Slovakia and Hungary is one such example.



Biopolitics in action: visions and projects of hope cornerstones for a positive future

Most solutions offered to our unprecedented but manmade global crisis are either inadequate or lack a strategy of implementation. A realistic response must at the same time think big (problem-adequate) and build on/link the wide diversity of local/regional solutions already available, leading to a shift in the public perception of what is possible and the experiment of new strategies. This requires inter alia new international institutions which both democratise the global level (globalisation) and install a bioethical framework for this process by promoting a new hierarchy of values.

Jacob von Uexkull

Chairman, The Right Livelihood Award

Environmentally-sound hydroelectric power projects

Tibor Harosi
*Renewable Energy Club
Budapest, Hungary*

Rivers running on their own alluvial cones form inland deltas, with numerous branches and islands, and large floodplains with wetland ecosystems. Alluvial cones are used to accommodate large potable water stocks. These river sections generally cause considerable shipping problems. The "classical" hydropower plant construction elements i.e., transverse dams, reservoirs, river canalisation, diversion of the majority of the water to artificial canals, series of drops in the original river bed, etc., generally cause unacceptable changes in the environment and especially in the wetland ecosystems. My innovation and proposal is a new approach: planning hydroelectric power plant systems with environmentalist principles; planning for maximisation of nature protection and conservation instead of maximisation of electric power production.

The new approach entails planning hydroelectric power plant systems with environmentalist principles; planning for maximisation of nature protection and conservation instead of maximisation of electric power production.

duction; planning hydroelectric power projects without reservoirs, transverse dams, and cascades to the floodplain

The environmentally sound hydroelectric power project for rivers running on alluvial cones is a self-regulating system, which can produce electricity without using the potential energy of the entire river, but only of certain "free" parts, which are not necessary for transporting the sediment. It can maintain the original dynamics of water level changes in the main river bed and in the tributaries, as well as the original dynamics of groundwater level changes below the floodplains and neighbouring terrains, because it will involve the construction of transverse dams only in the insulated shipping canals and not in the main river bed. It can save and restore the original wetland ecosystems and can save the quality of groundwater stocks in the alluvial cone. Moreover, it can support the normal shipping route for the whole year.

Building a civic society: democracy and civilisation

River power politics and bio-diplomacy

Ambassador Kai Falkman
Ministry of Foreign Affairs, Sweden

The mythical power of rivers, their healing capacity, consequences of respect and disrespect for "living water," river water as a political instrument and the role of diplomacy for international allocation of water resources, in order to prevent conflicts, are discussed. Bio-diplomacy is the new dimension in future river power politics.

Biopolitics versus sustainable development

Christos Efthymiopoulos
*Physicist
Biopolitics International Organisation, Greece*

Sustainability introduces new development models. Biopolitics introduces new value models for society. Sustainability is an anthropocentric concept. Biopolitics is a biocentric concept; it gives priority to the protection of bios rights and to the promotion of bio-culture. Sustainability is a one-generation approach to human development. The bios theory is a millennium approach to bio-environmental development. Sustainability provides practical guidelines for policy. Biopolitics provides sound ethical and educational foundations for society. Sustainability is an intermediate step towards Biopolitics.

Biopolitics provides sound ethical and educational foundations for society.

Quality of life: improving or deteriorating with time?

Dr. Konrad Waloszczyk
Technical University of Lodz, Poland

A basic contention among environmental thinkers is that the present, dominant techno-economic system causes a deterioration in quality of life, even in developed countries. This process has been particularly evident during the last two or three decades.

How can we establish the real indicators of quality of life? Is it improving or deteriorating in our time?

There are arguments to this view, however,

that do not focus as much on environmental degradation, but on other indicators of quality of life: a better education, health care, protection of civil rights, new means of communication etc. How can we establish the real indicators of quality of life? Is it improving or deteriorating in our time?

Biocentrism: new thinking

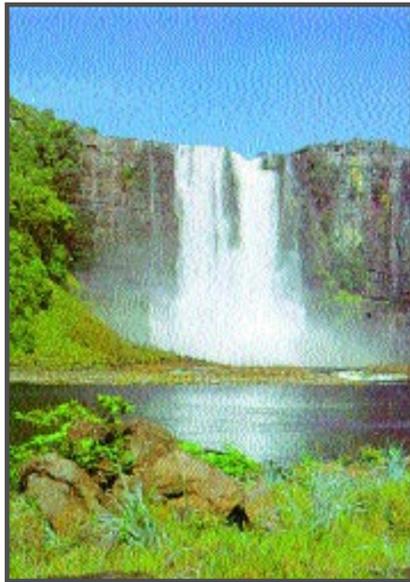
Professor Zdzislaw Piątek
*Head of the Institute of Philosophy of Natural Science,
Jagiellonian University, Krakow, Poland*

Biocentrism requires a radical revision of the position of man in nature and a certain detachment from our moral intuitions, that are shaped by anthropocentric traditional ethics. To comprehend the place of humans in nature, from a biocentric standpoint, a profound change in the widely accepted points of view is needed.

To comprehend the place of humans in nature, from a biocentric standpoint, a profound change in the widely accepted points of view is needed.

The idea of human superiority, so deeply rooted in Western European culture, is to be abandoned, along with the conviction that the biosphere was created for man and therefore all non-human living beings are of instrumental value only. Moreover, the conviction that man is the measure of all things, should also be abandoned.

Continued on page 12



The state of the environment in Venezuela

Ministry on the Environment and Natural Renewable Resources Caracas, Venezuela

The need for environmental monitoring is especially important in countries like Venezuela that enjoy an extraordinary variety of ecosystems, and a wide range of soils and climates. The conservation, protection and improvement of the environment in Venezuela is a strategic objective of the nation's development plans. The Ministry of the Environment and Natural Renewable Resources (MARNR) was set up in 1977, with the specific remit to reconcile the physical effects of economic development with the sustainable use of renewable natural resources. MARNR is responsible for the generation, compilation, analysis and dissemination of baseline information on the environment and renewable natural resources. In 1993, MARNR set up a National Centre for Environmental Statistics to provide reliable information on the scale of environmental problems in Venezuela, and on the successes and failures of environmental policy in dealing with them. What follows, is a series of reports on the state, quality and quantity of Venezuelan water resources, and an analysis of environmental problems linked to pollution from agricultural, industrial and urban activities.

Water resources are vital, and are intimately linked to climate, which can in turn be affected by human activity. Modern technology can affect not only the quantity and quality of water resources, but also alter the chemical composition of the atmosphere and background radiation. One of the principal concerns of the scientific community, and politicians, is the possibility of a global climate change.

Water resources

The surface waters in Venezuela can be divided into 5 principal watersheds. These are: the Orinoco river, Lake Maracaibo (connected to the Caribbean), the Caribbean itself, the Cuyuni river and Lake Valencia (linked to the Orinoco).

These basins have a total volume of 1,248 billion cubic metres (m³) a year. The Orinoco accounts for 94% of this.

Colombian rivers contribute significantly to the total volume in Venezuela (446 billion m³). The Orinoco (through its Casiquiare tributary) and the Cuyuni in turn contribute to the Amazon in Brazil and Guyana (85 billion m³).

Groundwater is more difficult to quantify, because the geological structures of underground water reservoirs are different. On the assumption that groundwater volumes are 3,800 times greater than surface water, the total volume of fresh ground water could be 3.05 million km³.

From inventories undertaken in Venezuela, aquifers can be classified as:

Aquifers with major potential: the Guanipa table, south Monagas, the Guarico river system, the Barinas and Portuguesa plains, the Apure plains.

Aquifers with medium potential: Barlovento, Caracas valley.

Partially depleted aquifers: Quibor valley, Coro.

(WMO) recommends densities of stations according to geographical circumstance. Venezuela currently has an ample network of rainfall stations, but insufficient hydrological and particularly weather stations (ranging from 24-94% below recommended densities).

Rainfall: Data collected at 39 stations for the period of 1968-91 showed that an average annual figure for Venezuela is 1,705 mm. Rainfall for 1993 was 1,874 mm, almost 10% higher.

Evapotranspiration: the average for 1968-91 was 1,105, while in 1993 it was 1,040 mm, some 6% lower.

River flow: measurements were taken at Musinacio near the Orinoco delta and at Caruachi, on the Caroni, from 1970-1992. The average flow was 37,385 cubic metres per second (m³/s). In 1993, it averaged 41,787 m³/s, some 11.7% higher.

Average water table levels have been monitored in ten aquifers (looking at average levels in four or more wells in each). From the 1970s to 1992, water levels in 8 of the aquifers fell by an average of 0.14 metres a year (m/y). Water levels rose in 2 aquifers, by an average of 0.13 m/y. In 1993, levels fell in 6 out of 9 aquifers by 0.36 metres. They rose in 3 aquifers by 0.27 metres. Figure 1 illustrates these trends.

Water supply

From 1943, the National Institute of Sanitary Works (INOS) was responsible for drinking water supply and waste water treatment for the vast majority of the population.

In 1989, a major restructuring of central government services saw the decentralisation of public water supply, creating HIDROVEN (the Venezuelan Hydrological Company) and ten regional water enterprises (EHRs), which started in mid-1991. After a period of transition, the EHRs are expected to become self-financing by charging for water supply.

The cost of a cubic metre of water is roughly 23 Bs (In late 1993, there were approximately 100 Bolivars to the US Dollar), and uses 11.6 kgs of chlorine and 38.7 kgs of aluminium sulphate.

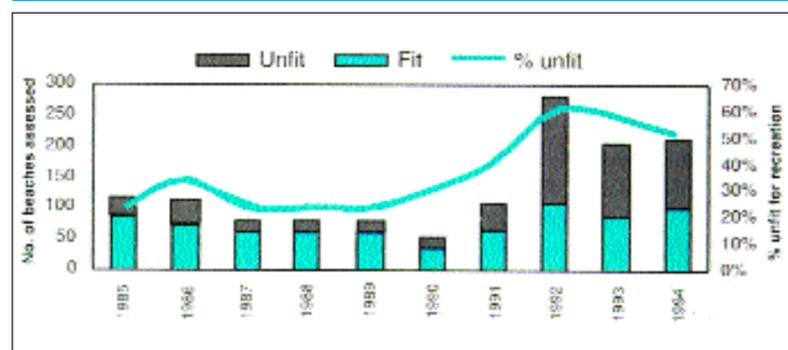
Water quality

Water quality requirements are determined by end use. In Venezuela, there are

water bodies.

A major data gathering exercise on water quality has been undertaken by the Hydrology Department across a national network of 205 stations on 172 rivers since 1986. This has yet to be analysed for systematic data on water quality. Prior to periods when there is an influx of holiday-makers

Figure 2: Beaches and seashore fit for recreation, 1985-94



7 such categories: domestic use, agriculture, shellfish farming, recreation, industry, navigation and energy generation.

Quality is assessed by organic matter content (Biochemical Oxygen Demand or BOD), suspended solids, dissolved oxygen, temperature, colour, smell, nitrogen and dissolved minerals.

Regulation 4 of the Environment Act lays down water quality standards that water bodies must meet depending on use.

Currently, the classified bodies of water are: Lake Valencia (for recreational use) and Lake Maracaibo (for recreational use, shellfish farming, navigation and energy generation).

Pollution

Venezuela's main pollution hotspots are in the north. Deterioration arises from intense agricultural, industrial and urban pressure on water, air and soil resources. Rivers, lakes and coastal waters are affected by different pollutants, such as partially treated or untreated sewage from industrial and urban centres, and from agricultural and cattle farming activities.

Recently, rivers in the south-eastern region have registered contaminants arising from gold mining and the extraction and processing of iron and aluminium.

The water bodies most affected by pollution are Lakes Maracaibo and Valencia, the Manzanares, Neveri, Tocuyo, Turbio, Tuy and Yaracou rivers in the south-east.

The Venezuelan government has promulgated a series of laws to control effluent discharges. A recently enacted Environmental Penal Act lays down a range of environmental offences and sets out the penalties for committing them.

Information

MARNR has developed information-gathering programmes for Lakes Maracaibo and Valencia, and the rivers Tuy, Neveri, Yaracou and Manzanares, as well as beaches and coastal waters which are heavily used for recreation and tourism. Water quality standards have been set for discharges to

ers (carnival, Easter and school holidays), a sampling programme is required by law on popular beaches to determine their suitability for recreational use.

In general, the percentage of unfit beaches increased from 1985 to 1992, and has been falling steadily in 1993/94.

The Directorate General for Environmental Quality of MARNR maintains a register of pollutant activities, covering aqueous, atmospheric and solid waste emissions.

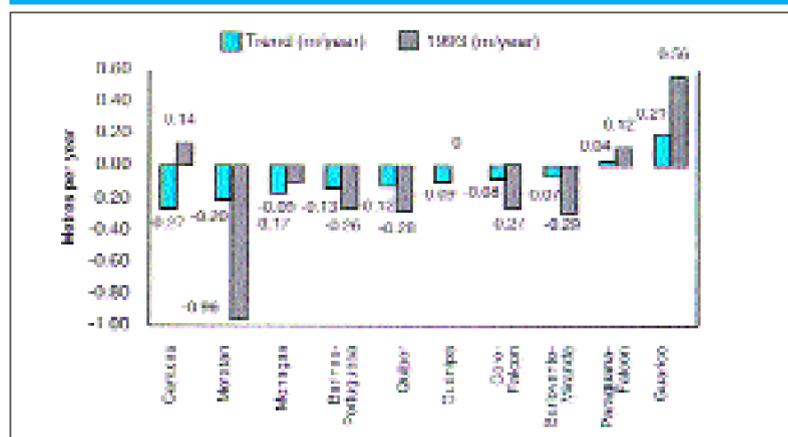
There are 2,426 sources of water pollution in the country, with 11,528 industries on the register. Of these, 374 (32%) have waste water treatment systems.

Industries can be required to report on up to 33 different parameters for effluent quality. MARNR requires water samples to be analysed at the expense of industry by one of 50 registered laboratories.

The Pan-American Health Organisation's rapid evaluation methodology for pollution sources gives emission factors to a range of industrial processes and domestic sources.

The Caribbean receives a pollution load corresponding to almost 69% of national industrial activity.

Figure 1: Trends in water levels in selected aquifers 1970s-93



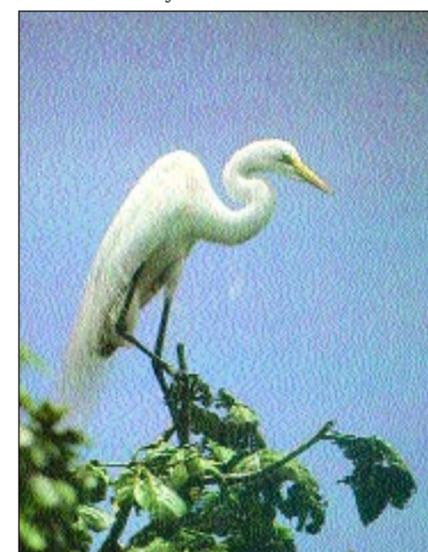
Monitoring

The Ministry of the Environment and Natural Renewable Resources (MARNR) is in charge of monitoring climate and water resources. It has an extensive network of The Venezuelan Air Force, Navy and various other organisations also undertake climate and water monitoring.

The World Meteorological Organisation

In 1994, HIDROVEN and the EHRs produced 2,854.4 million m³ water, supplying 83% of the population.

Some 62% of the population are connected to waste water and rainwater collection systems. Domestic users account for 31% of abstracted water; industry for 4%. Nearly 55% of abstracted water was not invoiced.



“Archipelagic Sense” asserts the essential unity of land and water in Indonesia, and their complimentarity with the air and sky above. It affirms that all four are vital components of the country called Indonesia, and its people are, therefore, called upon to defend, protect and foster, not only the individual components, but also the unity that sustains their existence.

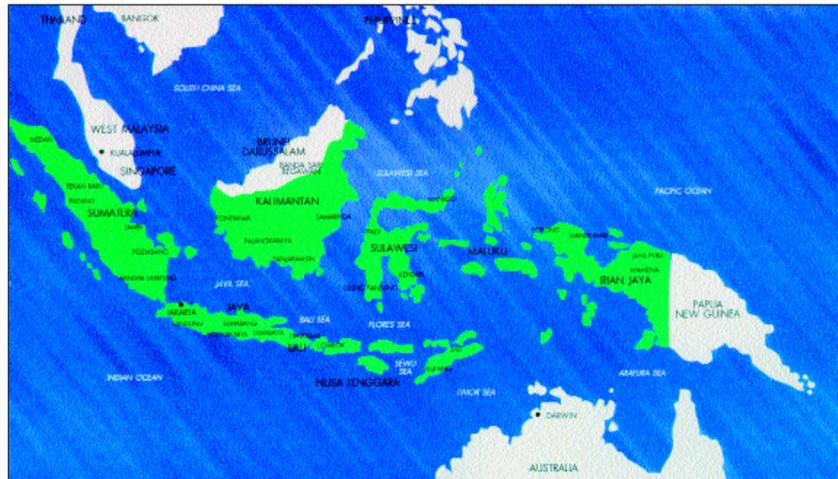
“Wawasan Nusantara” The Archipelagic Sense

Irawan Abidin

Ambassador of the Republic of Indonesia to the Holy See

It is of great significance that the Indonesian word for country is not just *tanah*, but *tanah air* meaning “land water.” The reference, of course, is to the fact that Indonesia, being the world's largest archipelago, has notably more marine territory than land.

There is also a good historical reason behind this. We Indonesians are of Malay stock - just like the Malaysians, Brunei's and Filipinos. Tens of thousands of years ago, our common ancestors lived in Southern China but with the explosion of the population of the Han people, they were pushed southward. By moving south, they



powers carved up the area among themselves and denied the people of the region the use of their own sealandes. It is, therefore, no wonder that after regaining their independence in

and foster, not only the individual components, but also the unity that sustains their existence.

This concept has had a great impact on Indonesia's stance on security issues. Knowing that Indonesia will never have sufficient man-power or military resources to be able to defend its vast land and marine territories against a determined invader, or invaders with vast resources, the Government has called upon every individual citizen - every man, woman and child - to exert his or her best efforts to protect the integrity of the components of the Fatherland.

The concept of Wawasan Nusantara was also the guiding consideration behind Indonesia's diplomatic initiatives, that helped bring about the successful conclusion of the 1982 United

The concept of Wawasan Nusantara was the guiding consideration behind Indonesia's diplomatic initiatives, that helped bring about the successful conclusion of the 1982 United Nations Convention on the Law of the Sea (UNCLOS).

Nations Convention on the Law of the Sea (UNCLOS). Together with the Philippines, another Southeast Asian country that is made up of thousands of islands, Indonesia ardently advocated for the adoption of the Archipelagic Principle in the Convention, and succeeded. Thus, the UN Convention on the Law of the Sea devotes its entire Part IV to defining the archipelagic State. The provisions of Part IV ensure, not only the protection of the territorial integrity and sovereignty of the archipelagic State, and its right to make use of its extraordinary marine resources, but also the safety and convenience of vessels or aircraft belong-

ing to other states that may find it necessary to make use of its archipelagic waters. Since its conclusion in 1982, the Convention has proven itself to be an important instrument for ensuring peaceful and co-operative relations between countries with common marine borders.

In this era of high technology and global interdependence, and as we learn more about the biological processes on this planet of ours, we in Indonesia find the concept of Wawasan Nusantara growing even more relevant. The concept has ever increasing applications, as it now represents a broader unity. Not just the unity of Indonesians with their land, marine territories, air and sky, but also their unity with all the life forms that

The people of Indonesia must serve as conscientious trustees of the environment and of all the creatures therein.

are sustained in the land, air and water environment.

We now have to be more conscious of the fact that all living things - human beings, animals, insects, plants and, even microscopic creatures, are united in a symbolic relationship, as they are also united in a reciprocal relationship with their environment. The Government of Indonesia has not yet issued a Declaration on the new context of Wawasan Nusantara, but I believe that Indonesian people are beginning to realise that, in the long run, they cannot survive by overly exploiting their God-given environment. They must also serve as conscientious trustees of that environment and of all the other creatures therein - particularly the biological diversity of their land and water resources. This entails the policy and practice of sustainable development, to which the Government of Indonesia happens to be already deeply committed.



always oriented towards the sea. That is how peoples of Malay stock came to occupy much of the coastal part of mainland Southeast Asia and virtually all of insular Southeast Asia. Sumatra, Indonesia's largest island, gave rise to the Sriwijaya empire, the greatest naval power that Southeast Asia has ever known.

But things changed radically when, starting in the 16th century, the countries of Southeast Asia were successively colonised by Western powers. The ocean which once united the countries of Southeast Asia, in trade and migratory movements, now became a barrier to their interaction, as the Western

the wake of the Second World War, the Southeast Asian countries, especially Indonesia, would become exceptionally zealous in guarding, not only their land territories, but, their marine territories, as well.

Thus, on December 13, 1957, the Government of Indonesia issued a Declaration spelling out a policy on “Wawasan Nusantara” which may be roughly translated as “the Archipelagic Sense.” It asserted the essential unity of land and water in Indonesia, and their complimentarity with the air and sky above. It affirmed that all four are vital components of the country called Indonesia, and its people are, therefore, called upon to defend, protect



Sustainable soil, water and air quality

The ultimate challenge and opportunity in the 21st century

J. Patrick Nicholson
Chief Executive Officer
N-Viro International Corporation, USA

In the historic novel *A Tale of Two Cities*, the author, Charles Dickens, tells us "It was the best of times and it was the worst of times." As time runs out on the 20th Century, no words better describe the 20th Century's historic impact on civilisation.

In the 20th Century, we witnessed unparalleled advances in science and technology, in the quality of life, in education, in communication, in medicine, and indeed in the very seeds of democracy. Yet, in the 20th Century we also witnessed more bloodshed of man by man, more terror and the development of the tools of terror, more destruction of family life and human discipline, more crime, more drugs of all kinds, and finally, in the end, more greed and avarice than ever before. Most importantly, we witnessed the unparalleled destruction by man of man's very home and environment. We witnessed man's greed and power allowing man to pollute and harm the air we breathe and the soil and water so essential to our survival. We began in this century to recognise the insanity of our actions, but these calls to action have been blunted and delayed and deliberately confused by the power of special interests to maintain the status quo which is so profitable to so few and so destructive to so many.

At the Fifth Biopolitics International Conference, held in Istanbul, in May 1992, Deonanan Oodit and Udo Simonis proclaimed that the hope for the future is conditional on decisive political action to begin managing environmental resources to ensure both sustainable human progress and human survival. "We are not forecasting a future; we are serving a notice - an urgent notice based on the latest and best scientific evidence - that the time has come to take the decisions needed to secure the resources to sustain this and coming generations."

In today's society can any world leader build that bridge to the 21st Century? Can any Chief of State the independent political leadership and courage to do what is critically necessary to sustain this planet Earth for our children, our children's children and their children? This indeed is the ultimate challenge and opportunity in the 21st Century.

Today, we are not providing sufficient food for the world's population and today, in providing what we do provide, civilisation is destroying the quality of earth's soils, waters, and air. Let's spend a few minutes to seek the truth. First of all, let's look at the problem. Mankind does not need to look to the future to see the folly of its actions, or more precisely, its inaction. The World Health Organisation, and other respected public health institutions, are dedicated to forcing so-called intelligent industrial nations to recognise the terrible Third World devastation caused primarily by food shortages. Is society responding to

this terrible human tragedy? Malnutrition is the major contributing cause in the deaths of over 14,000 children per day.

The degradation of worldwide farmland has been an escalating crisis for many years. Erosion, acidification, loss of organics and minerals, and overuse of chemicals and pesticides are causing great damage. Soil conservation efforts for the development of no-till farming are major efforts to stem the tide of farmland destruction. Today, most Third World countries do not have the soil to sustain agricultural production so necessary for their current food requirements and economic development. With a worldwide need for organics and minerals to sustain soil fertility, the wanton disposal of such resources in incinerators and landfills or in the oceans of the world is an international disgrace.



Concurrently, overuse and mismanagement of organic wastes such as cattle, hog and chicken manures, bio-solids, and some industrial wastes have caused great environmental damage to worldwide waterways and watersheds, through non-point source discharge pollution. The terrible damage to the Chesapeake Bay and the Florida Everglades are two well publicised cases in point. Proper use and treatment of organic and mineral waste can solve the sustainable soil fertility crisis and help protect watersheds.

The Worldwatch Institute, in their 1994 State of the World report, said: "It may be the ultimate irony that in our efforts to make the earth yield more for ourselves, we are diminishing its ability to sustain life of all kinds, human included. Signs of environmental constraints are now pervasive. Cropland is scarcely expanding any more and a good portion of existing land is losing fertility. ... Much of the land we continue to farm is losing its inherent productivity because of unsound agricultural practices and overuse. ... More than 550 million hectares (one third of all farmland) are losing topsoil or undergoing other forms of degradation as a direct result of poor agricultural methods."

Beneficial utilisation of bio-solids makes total sense. However, solving one problem by creating another does not. Organic land application programmes, whether they be bio-solids, manures, or industrial wastes, must not contribute to water pollution. Today most land application programmes contribute significantly to the problem of water pollution, particularly where seasonal restrictions are absent, where site restrictions and management practices are not adequately enforced, and where organic and mineral wastes have large concentrations. Soil and water quality demand seasonal restrictions, coupled with immobilisation technologies, to ensure slow release of organics and nutrients to provide sustain-

"The results of the present profligacy are rapidly closing the options for future generations. Most of today's decision makers will be dead before the planet feels the heavier effects of acid precipitation, global warming, ozone depletion, widespread desertification or species loss. Most of the young voters of today will still be alive. In the Commission's hearing, it was the young, those who have the most to lose, who were the harshest critics of the planet's present management."

**Deonanan Oodit, Senior Economics Affairs Officer, United Nations, and Professor Udo Simonis, Science Centre Berlin
Fifth Biopolitics International Conference, May 1992**

able soil conservation and fertility without destroying water quality. The management practices and the technologies needed to achieve this vision are now available. We only need the willpower and the leadership to act.

In 1993, the US Department of Agriculture

have been well defined by other international authorities besides the US Department of Agriculture. For example, the National Research Council's 1993 report on Soil and Water Quality: An Agenda for Agriculture, stated that: "Erosion, compaction, acidification, and loss of biological activity reduce the nutrient and water chemicals, slow the rate of waste or chemical degradation, and can increase the likelihood of loss of nutrients, pesticides, and salts from farming systems to both surface water and groundwater. Manure supplies nitrogen, phosphorus, and other nutrients for crop growth; adds organic matter and improves soil structure and tilt; and increases the soil's ability to hold water and nutrients and to resist compaction and crusting. Disposal of manure as a waste often leads to both surface water and groundwater degradation. Improved manure management can effectively capture the benefits of manure as an input to crop production and can reduce the environmental problems associated with manure disposal."

Let's summarise:

1. Our soils world-wide are losing their sustainability due to many factors, including an over dependence on chemical fertilisers and pesticides, soil erosion, mismanagement, and diminishing organic and mineral content.
2. A great opportunity exists through proven established technology to utilise the huge quantities of organic and mineral wastes generated annually to complement, not supplement, chemical fertilisers and pesticides, and to ensure world-wide sustainable soil fertility. However, the current uncontrolled use of such waste materials, creates immense water quality, sociological, and public health concerns and problems. Land application regulations of bio-solids and manures must require safe and inaccessible storage, pathogen reduction until time of use, responsible odour controls, and management practices and technologies that control leaching to ground water and runoff to surface waters. Today's regulations have no such requirements. Moreover, all regulations, particularly management practices and site restrictions must be enforced. Today there is little, if any, enforcement. When the government sets regulations that are predicated on off-site contractor compliance, then that government must provide funds to enforce those regulations. Without enforcement there is no compliance. Without compliance, public health, social responsibility, and environmental protection are all seriously endangered with current land application practices.
3. Current disposal practices for organic

developed an excellent report titled "Agricultural Utilisation of Municipal, Industrial and Animal Waste." In that report, the USDA stated that "annual animal manure production exceeds 2.2 billion tons." This is 40-50 times more than human sludge or bio-solids waste. Moreover, the report showed that BOD levels from such wastes were 10-100 times higher than from treated bio-solids. In other words, manures are 500-5,000 times a bigger problem or opportunity than bio-solids. However, in all reality, manure management is no-existent because non-point source water pollution regulation is non-existent. We have spent billions on point source pollution prevention. And yet we have done practically nothing on non-point source water pollution. Why not? What special interests are preventing sound and scientific environmental and agricultural policies and practices? Why are these issues being ignored? All we seek is the truth!

Waste utilisation problems present a challenge and an opportunity for agriculture. We are currently confronted with the long-term goal of developing crop production practices that promote sustainability. Animal wastes and many municipal and industrial wastes have substantial potential value for agricultural utilisation. The development of methods to optimally integrate waste utilisation into sustainable agricultural practices could provide a major part of the solution to urban and industrial waste disposal problems.

The challenge and the opportunity



and mineral by-products, such as ocean dumping, incineration, landfills, and lagoons, cause immense land, sea and air pollution problems. They can not be justified in any rational society. Tragically, if not scandalously, the USEPA now has regulations which encourage disposal practices in lieu of utilisation in spite of the clear intent of Congress to ensure resource recovery in lieu of disposal (RCRA 1976). EPA regulations for landfill disposal of sludges (40CFR258) are minimal as compared to their sludge utilisation regulations (40CFR503). They have no requirements for disinfection, stabilisation, and metal levels standards. In light of the intent of Congress, how does this make any sense? How can it be justified? The problems of airborne pollutants and odours from raw sludge in landfills alone, make such practices unsafe and unacceptable!

In 1992, the nations of the world met at the Earth Summit in Rio de Janeiro to address the critical ecological and environmental problems facing our planet Earth. The reduction of carbon dioxide to constrain global warming was the #1 priority issue. Do our current disposal practices even begin to consider or remedy this critical problem? The answer is an unqualified NO! Why not?

The dumping of raw sludge in landfills (as allowed in 40CFR258) clearly creates an immense addition to CO₂ emissions. Sludge incineration creates an immense addition to CO₂ emissions. Yet, today, our



USEPA condones and supports such actions. Simply, this is wrong! "Anybody there? Anybody care?" Again, all we seek is the truth!

The challenge is clear. Now let's emphasise the opportunities.

1. Most, but not all, nations generate sufficient organic and mineral wastes to provide sustainable soil fertility and to reduce dramatically their countries' overdependence on chemical fertilisers and pesticides. Sustainable agriculture is a critical component of sustainable economic development in most industrial countries and in all Third World countries. Third World countries must be able to feed themselves in order to provide agricultural jobs for their people!
2. In order for organic and mineral wastes to be utilised so as to not pollute either the water, the land, or the air, two requirements are absolutely necessary.
 - a. Sound soil nutrient management practices, including seasonal application, no till, zoning, crop rotation, etc., must be developed and implemented.
 - b. Technologies, such as compost and N-Viro Soil™, that immobilise and stabilise organics and nutrients so that they provide "slow release" soil fertility through controlled mineralisation, must be recognised and implemented. In seeking solutions it is important to remember the words of Pope John Paul II: "We are involved in a quest along with our fellow men ... let us avoid moralising or suggesting that we have a monopoly on the truth." Indeed, we welcome and encourage the development of alternative concepts or technologies that ensure results comparable to compost or N-Viro Soil™ and their ability to increase soil fertility while concurrently improving soil and water quality.
3. Technology transfer must be an essential component of that mag-



"Fields of vision"
Unloved sludge can be "beautiful" when blended with alkaline admixtures to form a bio-organic aglime product.

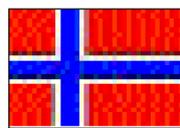
nificent visionary bridge into the 21st Century. That bridge must be wide enough to allow the environmental, agricultural and public communities to work together to do what is right. Political courage and leadership, together with scientific truth, are the absolutely vital components of that bridge structure.

In closing, let me ask you to consider the words of President Kennedy, "In the final analysis, our most basic common link is that we all inhabit this small planet. We all breathe the same air. We all cherish our children's future, and we are all mortal." We must, therefore open the windows so truth can overcome special interest political pressure. The time is ripe to take the decisions needed to secure the resources to sustain this and coming generations.

Waste management in Scandinavian countries

Waste is creating major problems, especially in large cities. New ways of waste management must be implemented in order to handle the problem. Landfills take up a lot of space, pollute the air and the ground water, and waste precious energy, as recyclable material is treated as garbage. In the search for new ways of reducing the waste problem, and creating new forms of energy - *bio-energy*, several methods of treating waste have been developed.

Bio-energy from sewage treatment in Stange, Norway



Norway

Stange county in Hedmark, Norway has introduced a new system for sewage treatment. The sewage is heated in a tank, under high pressure, and is vapourised. 55% of the sewage entering the treatment plant is treated in this way. The vapour is used to run the operation, but as the treatment process itself uses only 30% of the energy created, the remaining 70% is used for electricity production and heating of the treatment plant.

The technology has been developed by Cambi AS, who in 1992 received government subsidies for their pilot project of this kind of sewage treatment. Four years later they presented the fully developed treatment system which is now also introduced in Sweden, Denmark and Germany. Administrative Director of Cambi AS, Mr. Kjell Fredriksen, says that it was crucial for the company to receive support from Ekspomil, a governmental programme for the promotion of biotechnology and biotechnology exports.

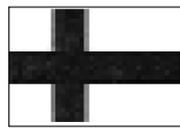
Cambi AS is now building a plant for treatment of organic food waste in Lillehammer. This plant will produce an extract by heating the raw material. The extract will be delivered to the communal sewage treatment plant in Lillehammer, which needs a fuel source to keep the process going. Up to now, they have been using alcohols as fuel.

The EU/EEC area produces more than 40 million tons of waste annually, and it is expected that the governments will enforce tough restrictions and tolls on waste disposals at landfills. This gives Cambi AS high expectations about the possibilities for plants such as the one in Lillehammer. The market for organic waste treatment will increase tremendously in the coming years.

This technology is also applied at Vestmarka, in Eidskog. The raw material utilised is wood shavings and the resulting product is fuel pellets. While conventional pellets have a loose consistency, fuel pellets produced by Cambi Bioenergy AS are harder and burn longer. These pellets can then be used, instead of coal, to power central heating systems.

Source: *Forskning 7/96 (Norges Forskningsrad)*

The Waasa process



Finland

In Finland, mesophilic and thermophilic waste treatment methods have been in operation since 1989, when the biogas plant outside Waasa was built. The technology developed for the digestion of different wastes has given the plant a wide-ranging digestion experience. The treatment plant creates biogas and compost from waste. Modern methods of digestion, such as the Waasa process, can also treat combined and mixed wastes.

The Waasa Process combines the following elements:

Mechanical pre-treatment: Mechanical pre-treatment, such as the shredding and separation of waste, is an essential step before the waste can be fed into the system for digestion. Pre-treatment methods depend on the type of waste used, as well as on how it was separated at source.

Mixseparator: One of the vital components in the Waasa digestion system is the Mixseparator. It has several functions in the process, such as: mixing the in-flow, homogenising the waste, separating and removing inert material, heating the waste, adjusting total solid content, weighing the waste, ventilating air/gas, intermediate storing.

Each one of these functions is required for achieving a controlled treatment of household waste. The Mixseparator was developed in close co-operation with the operator at the full scale plant. Frequency-controlled motors in combination with efficient screw-mixers guarantee that the result of the separation and mixing phases meets the require-

ments set for household waste.

Twin reactor: One of the unique patented advantages of the Waasa Process is its main reactor, which is divided into various, clear-cut, zones. The first zone is made up of a pre-chamber inside the reactor which has been tested in the digestion of household waste over many years. The unique advantages of the Twin Reactor are: (a) no risk for short-circuits due to the use of the pre-chamber, which gives a guaranteed hygienic retention time for all material fed in; (b) natural and efficient flow through the reactor; (c) efficient mixing, achieved through compartmentalisation; (d) efficient collection and emptying of sediments; (e) the process is not affected by possible temperature fluctuations of the injected batch

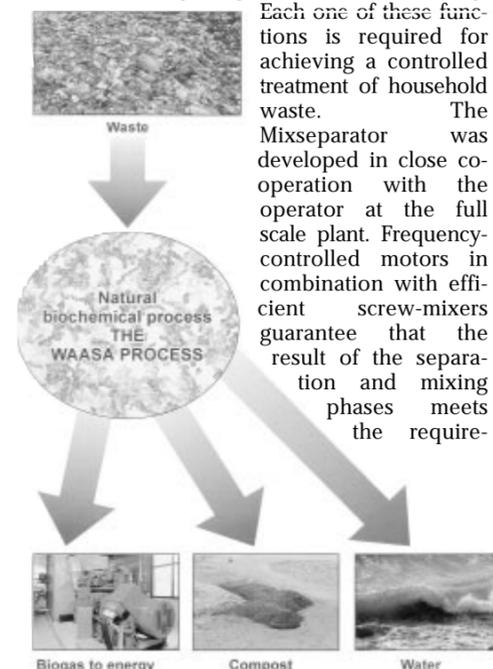
Bacteria injection system: By injecting bacteria through a pump and a set of nozzles, a small part of the active digestate is spread into the newly fed bio waste. Bacteria injection is an uncomplicated, well proven system. Its advantages are: shorter retention time and avoidance of phase separation in the reactor

3C system: CITEC has been testing a computerised consistence control system for measuring and controlling the most basic functions of the digestion process, namely loading and temperature. This procedure is carried out by means of loading cells built into the Mixseparator in combination with the monitoring of various parameters. The 3C-system uses special algorithms to optimise its operation, and unnecessary breakdowns can be avoided.

Bio Expert System: CITEC's Bio Expert System can learn by gathering experience from other Waasa Process plants, monitoring different operational parameters and obtaining information from the operator. The Bio Expert System can be used by the operator, in the same way a patient consults their doctor on the diagnosis of an ailment and suggestions for treatment.

Biogas and Energy production: Biogas production can be optimised by use of a modern control and monitoring system in combination with well trained operators. Alternative biogas uses include electrical energy and heat generation, automotive fuel, and the connection to natural gas pipelines.

Compost production: After a retention time of 10-20 days in the digester, the end product, called the compost, is extracted. The quality of the compost at the end of the process depends on several factors: the purity of the material fed in, the process type and also the post-treatment refining process. Effective control and monitoring of the digestion process results in a higher compost quality.



Evolution of a river: biodiversity, history and culture

The evolution of rivers

Dr. Igor N. Malakhov

Head of Council, National Ecological Centre of Ukraine

A river is a beautiful image of everlasting and mysterious evolution. When we look at water flowing in a river we never know where it is going or what its goal is. However we know for certain that the result of evolution is irreversible. The role of a river changes during the evolution of a society. Rivers were one of the most important channels of communication at the beginning of civilisation, because the process of "ethnogenesis" is particularly pronounced at the point where a river crosses the line between forest and steppe. Presently, rivers have been transformed by industrial and post-industrial societies to anthropogenic objects, consisting of several systems of water regulation. Sometimes a river can be nothing more than a chain of artificial lakes or a channel of pollution. So, in fact, rivers, as a rule, have irreversibly gone from being a natural channel of communication and information, to being an anthropogenic channel

A river is a beautiful image of everlasting and mysterious evolution. Presently, however, rivers have irreversibly gone from being a natural channel of communication and information, to being an anthropogenic channel of trans-border pollution.

of trans-border pollution. We must recognise, however, that this is a natural evolutionary development.

Many of us believe, that sustainable development is the process of limiting and optimising natural resource consumption. I hope that future society will evolve further and cease being a civilisation of consumption of natural resources, by transforming the question of "how" to "what for." Following this path entails changing the system of appreciation of the environment. It is necessary to consider the issue of *Quality of Life*, which is not the same as the *Standard of Living*, an indicator used in economics. Quality of Life is a combination of life expectancy and leisure time. Life expectancy is closely related to environmental quality and nutrition, and involves our biological needs, while leisure time involves our spiritual needs and our quest for self-realisation. Quality of Life is reflected in the harmony between man and the environment. The stream of evolution will be skewed, if harmony does not exist. That is why Quality of Life is a priority for achieving harmony between man and nature.

The role of historical rivers in human civilisation

Dr. Mykola M. Sappa

Khariv State University
Environmental Sociological Group
Ukraine

Historical rivers are those that cradled the first human civilisations. Specific conditions made people of different ethnic groups unite and join forces to combat hunger and natural catastrophes. This taught people solidarity and helped them form complex societies. In recent years, rivers as a means for communication, have contributed to the spreading of

Rivers can unite people again, just as the Danube has united us at this conference.

civilisation and to the cultural exchange among peoples. On the eve of post-industrial society, the environmental movement has put forward a new system of values, based on the harmonious development of nature and society. Its goal is to preserve the biosphere for the future.

It is interesting to note that saving rivers can be viewed as a concrete embodiment of this task. This concerns large rivers, such as the Danube, the Order and the Dnieper, but also several small rivers, that are usually taken care of by local NGO's. Rivers can unite people again, just as united us at this conference.

Rivers versus towns: front or back orientation?

Dr. Wojciech Kosinski

University of Krakow, Poland

Scholars have often stressed the fact that, in the history of our continent, rivers have played a considerable cultural role, shaped human settlements, intertwined with the history of States, towns and nations, and became one of the main features determining the fitness of architectural and urban projects. A crucial role in the history of Poland, and in its social and cultural development, was played by the largest Polish river, the Vistula.

Scholars have often stressed the fact that, in the history of our continent, rivers have played a considerable cultural role, shaped human settlements, intertwined with the history of States, towns and nations, and became one of the main features determining the fitness of architectural and urban projects.

For many centuries, most Polish towns developed in close harmony with rivers, which were not only essential to their social and economic progress, but also an important element of their landscape, immortalised by painters and photographers. The growing degradation of many rivers, the establishment of towns further and further away from their main-streams, and the gradual loss of their previous importance for agglomerations, have been responsible for the disappearance of rivers from modern art and from the consciousness of town inhabitants and local authorities. This is why a large part of our towns turned their backs to their rivers.

The importance of the Danube in Slavonic history

Dr. Valery Evorovsky

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Rivers have been cardinal to the history of most nations and have made the evolution of human civilisation possible. When man became a social creature, he started struggling with nature in an attempt to socialise. In this way he has been creating a parallel world, where reality has turned into a product of human activity and human thinking.

Different cultures regard rivers in different ways. Mongols, the children of the steppes, considered rivers a serious barrier to their expansion. For Egyptians, the Nile was a symbol of

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life, that guaranteed their welfare by supplying them with water. The North European and East Slavonic cultures have another image of the river. The Dniepr, Danube and Western Dvina, by virtue of their channel system, were attributed bonding characteristics.

Rivers flowing through particular lands influence the images of local civilisations, and their material and cultural configuration. The symbolism of rivers is otherwise very flexible and lacks complicated historical dynamics. However, the Danube has played a very special part in the creation of the modern picture of the European World. Settlements and ancient migrations have historically been connected to the Danube. The fight for a gateway to the Danube has always been a weighty strategic and diplomatic aim.



Settlement evolution in the Danube basin

Professor Alexander Reteyum
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A study of the long-term process of urban changes on the banks of the Danube river (with tributaries of different orders, according to the Horton-Rzhanitsin system) and their environmental implications will be presented. The analysis reveals a tendency of populations to move towards major rivers and especially towards the Danube. This effect poses different stresses on the environment in upstream and downstream regions. Pictures taken by Russian satellites, since the 1970's, show an expansion in urban development, shrinkage of river wetlands, and the deformation of the Danube delta. It is, therefore, possible to foresee possible trends in population distribution, for the coming 20-25 years, and draw some conclusions about the environmental status of the Danube basin in the future.

Population settlements have a tendency to move towards major rivers.

Biodiversity in the Bulgarian sector of the Danube

Dr. Svetoslav Gerasimov and Ivan Yanchev
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The Bulgarian sector of the Danube covers a 480 km course, between the river's 845th and 375th km of flow. The total area of Bulgarian wetlands has been reduced by a factor of 20 during the last few decades, as a result of an increase in arable lands and other anthropogenic activities, including industrial and household waste pollution. This reduction has led to a considerable decrease in flora and fauna biodiversity, especially in the regions of Svishtov, Belene, Tzibar, Archar, and Vardin.

This study focuses on the problems of biodiversity in the wetlands near the Danube, as well as its estuaries, and proposes measures for its protection. The status of the Srebarna Biosphere Reserve, as a typical example of the wetlands in the vicinity of the Danube, is also addressed. A brief review of the changes in the biodiversity of amphibians, birds and mammals is made with an accent on rare, endangered and protected species. The different categories of protected areas are also reviewed. The possibilities for improving the management for nature conservation through effective use of national legislation, international co-operation and constant monitoring of the region are discussed as well. A common economic policy on the Bulgarian sector of the Danube and adjacent territories is suggested.

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Bio-education and academic policy

Environmental education on the way to new thinking

Olga Mushikina
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The extensive development of industry, agriculture, construction and tourism, in all the countries of the Black Sea region has led, in the last decades, to the appearance of complex environmental problems. These include among others, the problem of marine eutrophication, associated with the sharp increase of biogenic substances (phosphorus, nitrogen, etc.) in river sewage collection. The drainage basin of the Danube, Dnieper and Dniester alone, carries each year an average of 280 cubic metres of fresh water, where the concentration of phosphorus has risen from 10 to 200 mg/l, and that of nitrates from 20 to 100 mg/l. This led to a mass increase in seaweed, to the decrease of oxygen production, and to the destruction of benthic organisms.

The environmental crisis, compromising the whole globe at the end of the 20th century, is the result of our "cowboy" attitude towards nature. In order to overcome this attitude, humanity needs to muster the help of all accessible methods, including social environmental education.

Red tides became chronic in the coastal waters of Bulgaria and Romania. Eutrophication is especially severe in the shallow, north-western part of the Black Sea.

The Black Sea was polluted, with dangerous amounts of hydrogen sulphide, following the Chernobyl disaster. Novorossiysk is the biggest Russian port on the Black Sea and has to overcome the same problems as the other countries of the Black Sea region. The environmental crisis, compromising the whole globe at the end of the 20th century, is the result of our "cowboy" attitude towards nature. In order to overcome this attitude, we need to muster the help of all accessible methods, including social environmental education. This will help instill the necessary new thinking, without which it is impossible to solve environmental problems, and secure the stable coexistence of man and nature. In this process, the role of educators and educational institutions is of major importance.

The symbolism of water: philosophical anthropology and aesthetics

Professor **Maria Golaszewska**
Jagiellonian University in Krakow
Poland

Water, the source of, and a necessary condition for, all forms of life may be considered from several points of view. As a simple chemical formula (H₂O), as a smaller or greater entity, accessible to our perception, and as an aesthetic experience. This experience is multifaceted, as it can be shared by all the senses (sight, hearing, touch, kinaesthetics etc.). A particularly fascinating aspect in the appearance of water is its continuous movement and change. To the vital role of water, one can add utilitarian, moral values (duty to protect the purity of water reserves) and aesthetic values, which are close to the moral ones: it is important to preserve the beauty of water resources in their different states.

A large number of problems concerning the Danube river appear here,

because it is an international river, flowing through 10 countries. Does it link various countries and nationalities, or divide them (social aspect of water)? How deep is the international engagement in an endeavour to clean up the Danube (ecological and moral aspect)? What is the Danube like in the eyes of artists? What is the importance of the Danube for the countries through which it is flowing? What values, connected with this fact, are most appreciated in each of these countries?

The Danube may be treated as symbol for bringing nations together, and for promoting industrial development, environmental health and the beauty of nature. The river is the frontier that divides and unites at the same time.

Historians can point to several disasters that rivers have caused over time. For water, being friendly to man, can also be the cause of calamities and disasters like floods, inundations, rainstorms etc. Does this also concern the Danube? The Danube may be treated as symbol for bringing nations together, and for promoting industrial development, ecological health and the beauty of nature. The river is the frontier that divides and unites at the same time.

Current concepts in pollution prevention and resource conservation

Science and technology: benefits and risks for the Danube river basin

Dr. **Ivana Djujic** and Dr. **Borivoje Djujic**
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The progress of science and technology has created many conveniences and has enabled humans to better adapt to their environment. However, human actions have induced an accelerated degradation of natural resources. It is seldom taken into account that each problem is, to some extent, a cause and a consequence of all the others.

Today, we are witnessing dramatic and interrelated changes and we are not even able to precisely evaluate the extent of the loss. Those who are involved in the rapid development of science and technology, are often not interested in the final result, and do not think about the consequences for the bio-environment. They have apparently forgotten the golden rule - all is good in moderation.

The results of the rapid deterioration of our habitat and the delayed response to such an enormously complex problem are causing a global crisis. Values are being confused and humanity is unhappy

because of a lack of reasoning (based on ignorance) and a lack of action (based upon desire). We cannot reason correctly and safely, and we have generated the appearance of greed, anger and foolishness, causing suffering by wrongful acts of the body and mind. Desires and actions that are consequences of incorrect judgement cause suffering.

In the Northern part of the Balkan peninsula (an area smaller than 150,000 sq.km.), there will be 20 nuclear power plant units (NPP) still in operation, by the end of the century. These are located in Kozloduy, Bulgaria; Bouhunic, Slovakia; Krsko, Slovenia; Paks, Hungary and Cernavoda, Romania. After the year 2000, at the above mentioned locations, there will be about 870 tons of UO₂, in the NPP reactors, and probably about 400 tons of spent, highly radioactive nuclear fuel, altogether amounting to more than 1021 Bq of radioactivity. This is without taking

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into account industrial infrastructure facilities, constructed on nuclear fuel cycles, nor the approximately 200 thermal power plants operating in the area, along with one dam on the Danube, already in function, and two under construction. Furthermore the world's largest chemical companies are located in the Danube river basin, and they would quickly relocate abroad if politicians decided to adopt Eco-taxes or a similar energy tax. Detergents, oil, polycyclic aromatic hydrocarbons, polychlorinated biphenels, pesticides, insecticides, different metals and radionuclides have severe bio-environmental consequences. Market economies that

did not take into consideration the environment as an equal asset, and built entirely on the cost of goods, permitted the use of obsolete technologies and production cycles, in order to increase productivity.

For the first time in industrial history,

major chemical companies are being run by people without a scientific background; by those with a background in economics, law, or marketing, for example. They have said that we can be quite optimistic about the future because "optimism is much more creative than pessimism" and that the chemical industry has the greatest potential to provide humankind with solutions to feed the population, to protect the environment, and to fight diseases.

Can catastrophes be prevented? Can we make sure that children grow up in a good and safe environment in the future? Can financially poorer nations be richer in cultural values, art, tradition or biodiversity? We are facing the dilemma of how to help the weak, when the market economy states that it is only right for the strongest to survive. The promotion of long-term multilateral initiatives for a more through appreciation of both our natural and cultural heritage can bring us together, in a common cause, only if our desires and actions are based on correct judgement.

Danube coastal groundwater quality and pollution

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An extensive hydro-geophysical study was performed, in order to assess the vulnerability and risk of the aquifer system in the Yugoslav part of the Danube, since this system constitutes a primary source of drinking water and is also used for industrial purposes and irrigation. A large number of civil, industrial and agricultural activities, that take place in the area, are a potential source of pollution for groundwater resources, through land occupation and

The aquifer system in the Yugoslav part of the Danube constitutes a primary source of drinking water.

use, as well as through the disposal of solid and liquid wastes.

The study focused on the Salinac field, near the town of Smederovo, because this area is near the Derdap reservoir. The study involved the delineation of the aquifer, to obtain data on groundwater levels, groundwater chem-

istry, clay content, filtration characteristics and the physical parameters of geological functions. The purpose was to map aquifer vulnerability, in order to prevent and moderate the harmful influence of the artificial reservoir on the environment (increased groundwater infiltration from the reservoir into surrounding rocks, permanent groundwater level raising, etc.). Based on the results, zoning of the study area, according to aquifer vulnerability, was also performed. Land-use planning and the development of strategies for groundwater protection and management was subsequently possible.

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Peru: Dr. *L. E. Ruelas Lierena*, Advocate, United Nations Association Institut for Green Areas - Dr. *P. Nicolas Ruelas Lierena*, Biologist, United Nations Association Institut for Green Areas - H.E. the Ambassador of Peru *Mr. E. de Habish*
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Austria: Dr. *Zilk*, Mayor of Vienna

Barbados: *H.L. Broomes*, Permanent Secretary Representative, Ministry of Labour and Environment

Bulgaria: Professor *Z. Zakhariov*, President, Foundation Slavyani

Canada: The Honourable *J. J. Charest*, Minister of the Environment

Chad: Dr. *K. Alio*, Secretary General, Chad UNESCO Commission

Colombia: Professor *M. Suarez Melo*, Rector, Colegio Mayor e Nuestra Senorad

Cuba: *T. Averhoff*, Director General, United Nations Association

Finland: *A. Kalela*, Special Advisor

France: *A. Badran*, Assistant Director General for Science, UNESCO - *J.M. Chasseriaux*, Delegate of International Affairs, Ministry of Research and Space

India: Dr. *K. Singh*, Member UNESCO, International Commission - Dr. *M.S. Swaminathan*, Chairman, M.S. Swaminathan Research Foundation

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Iran: Dr. *A.M. Kassai*, University lecturer, Director, Office of Scholarships and International Affairs.

Japan: Professor *K. Yoshida*, Department of Chemical Engineering, University of Tokyo - *C. Igaya*, Member, International Olympic Committee

Lithuania: Dr. *E. Riepsas*, Lithuanian Forest Research Institute

Malawi: *C. Majiga*, Programme Officer for Science, National Commission For UNESCO

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Switzerland: Dr. *J.P. Dobbert*, Lawyer, Member of the Board, A.S.N.U.

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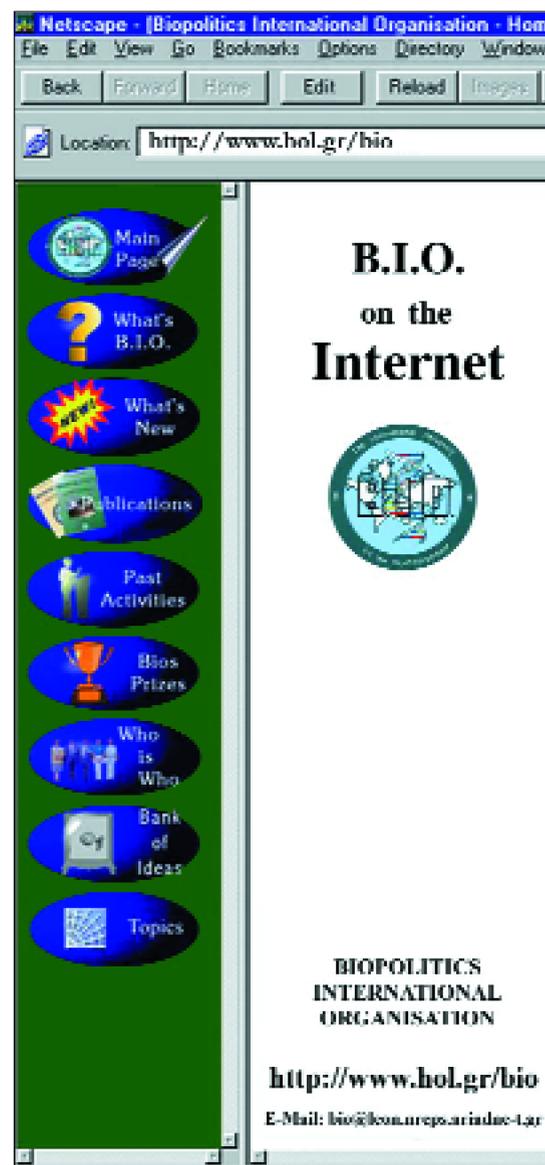
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BIONEWS Periodical, Volume 1, No. 1, 1987

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