

THE BALATON BULLETIN # 18
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Steering Committee Meeting

On April 23-24, 1988 the INRIC Steering Committee met at Joan Davis' house in Toessriedern, Switzerland, to discuss administrative matters, funding, and the Balaton Group's next annual meeting. Present were Joe Alcamo, Wouter Biesiot, Hartmut Bossel, Csaba Csaki, Joan Davis, Tamas Jaszay, Dennis Meadows, Dana Meadows, and Niels Meyer, representing eight INRIC centers in seven nations.

The meeting began with an exchange of news about happenings in the Balaton network since we last assembled at the 1987 meeting last September. (Much of that news is reported later in this *Bulletin*.) It is typical for a network that no single person is aware of everything that is happening among all the nodes. Therefore, it amazed everyone at the Steering Committee meeting to learn how much is going on, how busy and productive our various centers are, and how many visits, workshops, and joint projects are taking place among members of the network. Our mutual report to each other assured us that the Balaton Group is accomplishing the goal we originally had for it -- stimulating international cooperation among its members, so they become more effective in supplying pragmatic, holistic information for sustainable resource management within their own regions.

There followed a discussion of the next annual meeting, its possible format, topics, and scheduling. We decided to repeat the format of last year -- morning plenary sessions, afternoons free for working groups, evenings for slides, videos, movies, informal presentations, singing, and dancing.

Many useful topics were suggested for the four morning plenary sessions:
water management
sustainable cities

efficient energy futures
sustainable agriculture
biotechnology and its implications for sustainability
indicators of sustainability
international relations and agriculture
the ecological basis for development
biomass energy
accounting for carbon and chlorine flows
effective communications and training

The first four of these topics were selected for the 1988 meeting, with the understanding that the others will remain on the list for future years. Further details of the upcoming meeting can be found in the next section of this *Bulletin*.

Finances were a major topic of concern to the Steering Committee, since the expenses of the network are going up (because of more members and more activities and because the full costs of the Hungarian meeting must now be paid by the network), while the grants that have supported us so far are running out. Various sources of funding were identified, members volunteered to investigate them. Dennis promised to have a new, introductory brochure describing INRIC for the September meeting.

We considered different possible locations for the Network's headquarters after August 1988 when they can no longer be at Dartmouth. We discussed having a European headquarters, or rotating the central office through the centers, or affiliating with other organizations who have more established central office facilities. The general agreement was that the headquarters should stay in close proximity to Dennis and Dana Meadows (more news about their plans later in the *Bulletin*).

Since several members have just produced draft papers of excellent quality and general interest, we discussed INRIC's publications policy. We would like to make our members' best reports available to Balaton Group members and to the larger community. It was agreed that our informality, budget, and staff do not presently permit us to undertake our own publication program. However, we expect that the network will soon function to help good papers get published and publicized and made available in as many of our countries and languages as possible. Eventually we expect that one of our centers will take responsibility for printing and distributing the best publications prepared by members throughout the network.

We reviewed the progress of several Balaton Group projects: low energy futures for Europe, sustainable agriculture, the workshop on principles of resource management, and participation in the State of the World telecourse. All projects are progressing; more on them later in the *Bulletin* and at the annual meeting.

Scattered throughout the Steering Committee discussion were breaks while we prepared and served meals together, walked along the Rhine River, visited Sandra the Toessriedern camel, weeded the garden, and otherwise enjoyed the fine Swiss springtime weather, each other, and the never-failing charm of Joan Davis's hospitality.

The Next Annual Meeting -- Balaton '88

Dates

The next annual meeting of the Balaton Group (INRIC) will take place September 6-11, 1988 at our traditional facility, the resthouse of the Hungarian Oil and Gas Trust in Csopak, on Lake Balaton, in Hungary.

The meeting will officially begin Tuesday, September 6; it will close on Sunday, September 11. Those arriving on Monday the 5th or departing on Monday the 12th will have free access to rooms in the student dormitory of the Karl Marx University in Budapest.

There will be a Steering Committee meeting in the University dormitory on the morning of September 6; this is required for Steering Committee members, and it is optional for all other participants in the annual meeting. The bus to Csopak will leave from Budapest after meeting the early afternoon train from Vienna on September 6, and the first plenary session will start that evening. The bus will return to Budapest immediately after lunch on Sunday, September 11. Participants will be able to connect with trains or planes that leave Budapest after 4:00 pm on Sunday.

Funding

This year all living and travel expenses within Hungary are paid by INRIC, not by the Hungarian sponsors. Participants are normally expected to pay for their own travel to and from Budapest, though a grant provided by The Rockefeller Brothers Fund can be used to pay whatever travel costs participants cannot pay for themselves.

Participation

Experience has shown that the meetings are most effective when they involve about 35 participants. But this *Bulletin* is now mailed out to well over 100 people interested in the activities of our group; obviously, not all readers can attend. We want to hold the meetings to an optimal size. Yet we wish also to provide opportunities for one-time visitors and for those who have special professional reasons for attending, even if they are not formally associated with an INRIC center. We have therefore evolved the following procedure for issuing formal invitations.

Appended to the end of this issue of the *Bulletin* is a preliminary registration form for the fall meeting. Those who wish to apply for participation in the meeting should fill this form out and return it immediately to Dennis Meadows. On the form you can indicate: (1) your summer address and telephone number, (2) the proposed details of your arrival and departure in Budapest, (3) the amount of money you would need from INRIC to support your travel to the meeting, and (4) the titles of presentations you would like to make.

Deadline for receipt of this preliminary form is under any circumstances June 30.

These applications will be reviewed to select a roster of participants that: (1) is active in research, consulting, and teaching on Balaton Group issues, (2) gives wide geographical diversity, (3) lies within

our funding limits, (4) provides continuing infusion of new viewpoints, and (5) offers us the chance to become acquainted with excellent new centers that could eventually join our network.

Before July 15th we will have sent out formal invitations and confirmation of travel grants to all those invited to attend the meeting. In most cases we will be able to confirm your participation immediately after receiving your application. The confirmation will provide you with information about contact personnel, Budapest addresses and telephone numbers, and other information required to prepare for the session, travel to Budapest, and meet up with the group.

Program

As they did last year, the four plenary sessions will cover two topics that are new to Balaton Group meetings and two that will deepen our knowledge of subjects we have discussed before. The themes and chairpersons for the sessions will be:

- Sustainable citiesJoe Alcamo
- Water managementJoan Davis
- Low energy futuresNiels Meyer
- Sustainable agricultureDana Meadows

It is up to each chairman to choose the speakers and to schedule the plenary time in ways that do justice to the topic and still allow plenty of discussion. If you would like to contribute a formal presentation on any of these subjects, indicate your wishes on the preliminary registration form **and** contact the appropriate chairman **RIGHT NOW**. The schedule needs to be established, with abstracts of each presentation, to allow the preparation of printed schedules by August 1.

If you would like to convey to the meeting participants information from your work on other subjects than the ones listed above, you have several options:

- prepare a poster presentation,
- bring along publications to distribute,
- schedule an afternoon working group, or
- make an informal evening presentation.

Note that evening presentations should be on topics that do not require so much concentration: slide shows of your home country and its resource issues are popular. You can indicate your desire to follow any of the above options by filling out the appropriate questions on the preliminary registration form.

Mahidol University's Graduate Program in Environmental Management (by Chirapol Sintunawa and Dana Meadows)

Thailand has long had an active environmental movement among its students and scientists. In the early 1970s this movement created considerable political uproar by exposing two scandals - the pollution of the Mae Klong River by sugar mills and the Army's practice of game hunting by helicopter in the Tung Yai Wildlife Reserve. As a result the Thai Constitution was rewritten to include an article on conservation of natural resources and the environment, a National Environmental Quality Act was passed, and the government established in 1973 at Mahidol University a new Environment Education and Research Project.

That Project became a permanent Faculty of the University in 1978, now called the Faculty of Environment and Resource Studies. Its founder and initial director was one of Thailand's most outspoken environmental activists, Dr. Nart Tuntawiroon.

The guiding idea of the Faculty was to bring together experts in many disciplines to do research and teaching as interdisciplinary teams. Dr. Tuntawiroon wrote:

Planning and management of resources and the environment for tomorrow's world are too complex to be left in the hands of specialists who have too narrow a view to be able to perceive the world in a holistic manner.... A Thai economic planner, sitting in his air-conditioned room in Bangkok, juggling figures ... would be pleased to endorse the policy of deforestation to increase available land for maize and cassava cultivation, as these crops show handsome figures in the list of annual export revenue. He does not realize that this is perhaps a suicidal policy in the long run, as maize and cassava draw nutrients which have been accumulated in the soil by natural processes through thousands of years.

This same economist will quite likely, with all good intention, approve of a plan for building a reservoir for irrigation, power generation, or industrial consumption. He will not be aware that the money invested may be entirely wasted, as there will be no water to fill the reservoir, since the watershed feeding it has already been destroyed. It is most unlikely that he will understand the secondary and tertiary effects of some development projects on the environment, such as why dam building should create salinization, affect fish population, or spread schistosomiasis.

To avoid this kind of narrow-mindedness, the Faculty of Environment and Resource Studies advocates training people to act in "an interdisciplinary team, each member of which must be quite competent in his own field and yet be able to work with one another in harmony toward a unified objective. This is, of course, much easier said than done, and training manpower for such a purpose cannot be easily accomplished. It can perhaps be likened to an orchestra, each member of which must not only have a complete mastery of his own individual instrument, but must also be able to perform with others in perfect harmony to produce a symphony."

About 25 students each year are admitted to the 2-year Master's Program in the Technology of Environmental Management. It is by far the most popular and highly competitive postgraduate course in the country -- an average of 800 candidates take its entrance examination. The entrants already have bachelor's degrees; most of them also have several years of working experience in fields such as public health, agricultural engineering, soil science, fisheries, economics, biology, forestry, or geology. They spend their first year in intensive course work, as follows:

Semester One

- Ecological System Analysis
- Systems Approach and Cybernetics
- Pollution Problems and Control I
- Population Studies
- Sociology and the Human Environment
- Introduction to Mathematics and Science (for those with backgrounds in social science)
- Introduction to Economics and Management (for those with backgrounds in science)

Semester Two

- Environmental Conservation and Resource Management
- Mathematics Applied to Environmental Systems
- Pollution Problems and Control II
- Economic Analysis of the Environment
- Administrative Systems for the Environment
- Physical Planning in Relation to the Environment

In addition to these courses, during the first year students take five field trips to study the Thai environment and Thai development problems firsthand. Four to six faculty members accompany the students on each trip. The first trip is a general introduction to Thailand's varied bioregions and cultures, from the hills of the Northeast to the fertile central plain. On the second trip the students visit the Faculty's ecological field station in the South and study the ecology of a mangrove coastal region and the coffee-growing hillsides above it. The third trip involves physical sampling, interviewing, and analysis. The students spend 12-17 days in a village, collecting data on the population, economy, water, soils, agricultural yields, ways of life. A different village is visited each year; sometimes a village is so remote it has to be reached by elephant or bamboo raft. The comprehensive report the students produce becomes part of a growing data base on village life in Thailand.

The fourth and fifth trips require the students to draw on all they have learned and to produce a product that will be of direct use in resource management. One trip is to a national park or wildlife reserve; the students work together to draw up a conservation and management plan. The final trip is to prepare a comprehensive environmental impact statement for a proposed development project -- the site is chosen in response to requests by the government. The students spend 4 weeks on site and 2 months preparing their final report. They have taken on such topics as a proposed deep-sea port, an offshore mining operation on the beautiful tourism island of Phuket, and the Nam Choan Dam.

Each second-year student works with one of the 20 faculty members on research, which is written up for a thesis. Much of this research is commissioned by the Thai government. Examples of thesis topics are:

Effects of sediment from mining activities on the coastal aquatic ecosystems of southern Thailand.

A socioeconomic impact analysis on the use of bio-gas in Thai rural households.

An economic evaluation of land degradation through crop nutrient removal by cassava, sugar cane, and maize.

A forecast of the saturation point for the expansion of Bangkok International Airport.

An integrated approach to wastewater treatment in the tapioca starch industry.

An investigation of pesticide content in human tissue in the Thai population.

The relationship between socioeconomic environmental factors and the performance of pupils from slum and non-slum districts of Bangkok.

More than 200 students have now graduated from the Faculty of Environmental and Resource Studies. They have retained their disciplinary identities as engineers, lawyers, educators, etc., but they have gained the additional ability to understand, communicate with, and work with people of other disciplines, and they have learned to see some of the long-term environmental and social consequences of short-term decisions. They now work at the National Environment Board, the National Energy Authority, the Ministries of Agriculture, Industry, Education, and Defense, the Departments of Forestry and of Mineral Resources, and in the Office of the Prime Minister. Some of them work as communicators for newspapers and television. Some are teachers, including members of the Faculty of Environmental and Resource Studies. Many of the graduates continue to work with the Faculty as consulting experts on particular teaching topics or as sponsors of research.

Recently the Faculty has admitted 15 more students into a second Master's Program, this one in Appropriate Technology and Resource Development. These students come only from science and engineering fields. Many of their courses and field trips are the same, but new courses have been added in appropriate technology, energy systems, machine design, and resource use.

The program of teaching and research described here is obviously an ambitious one for any country, much less a rapidly-developing country with many needs and a great foreign debt. It is financed partly by government research grants, partly by student tuition, but mostly by direct government support of Mahidol University. The University Rector, Prof. Natth Bhamarapravati, says, "We are a country with an average income of \$900 per capita. But we support our university and train our students as if we had \$2000 or even \$4000 per capita -- with the belief that doing so is the best way to insure that someday we will have that much!"

Good News from South Africa -- the Natal/KwaZulu Indaba (by Elizabeth Dostal)

The Institute for Futures Research at Stellenbosch University has played a key role behind the scenes of South Africa's most exciting political process, the Natal/KwaZulu Indaba.

Indaba is a Zulu word describing a "gathering to discuss a specific matter." Natal is one of South Africa's four provinces and KwaZulu one of South Africa's ten black national states. The Zulus are South Africa's largest ethnic group, numbering about 6.1 million, of whom about 4.8 million reside in Natal/KwaZulu, together with about 1.3 million whites, Indians, and people of mixed blood. From a geographic and economic point of view, Natal and KwaZulu are one entity. Due to apartheid, however, the region is cut up and administered by two racially-determined bodies, the (white) Natal Provincial Administration and the (black) government of KwaZulu.

During the last decade awareness was growing that what happens to the people in KwaZulu would also affect those in Natal and vice versa, and that the region is essentially indivisible and should form one socio-political entity. In the early 1980s two initiatives arose to promote this idea, one commissioned by industry and one by the Chief Minister of KwaZulu. However they were not accepted by either provincial or central government.

In 1984 the Natal Provincial Administration invited the Institute for Futures Research to assist them in their long-term planning. This project was originally conceived as a run-of-the-mill, long-term analysis of the socio-economic prospects of the region. On the Institute's initiative an observer of the KwaZulu government was invited to be present at the planning meetings. During those meetings, it soon became apparent that a major obstacle to effective long-term development in the region was the serious lack of communication and cooperation between the Natal Provincial Administration and the KwaZulu Government.

This recognition prompted the observer from KwaZulu to initiate a similar planning exercise with the KwaZulu Government. This time the Natal Provincial Administration was persuaded to send several observers. Pessimists predicted that the meeting between the two previously uncooperative ruling bodies would be aborted within a few hours. Instead, they could not stop talking after one and half days!

What did they talk about? Every issue of importance to the region -- resources, economics, education, technology, demography, health, transport, employment, housing -- everything except politics. The realization dawned that whatever the political system, most of the problems remain the same and that strategies beyond that of a new political system are required to solve these problems. The tone of the discussions was constructive and positive, focussing on challenges and opportunities. Increasingly the meetings developed a common understanding on the major societal forces that can shape the future of the region.

At the closing of the last workshop the question was asked: What is the most important issue the region is confronted with? There was a long period of quiet reflection. Then one member of the KwaZulu Government stood up and said, "We should transcend our differences -- we should become one." Everyone agreed. A vision was born!

Joint committees of politicians and civil servants were set up to examine all avenues for permanent cooperation. Specific areas of common interest that were identified were:

community development and family planning,
health and community services,
urbanization and housing,
education,
small business development and job creation,
environmental protection,
social awareness and communication.

Within a short time a number of areas of rationalization of activity and expenditure had been identified, and all of them promised to yield significant savings. The formalization of the cooperation through a Joint Executive Authority was proposed and later established.

One of the initiatives of this Joint Executive Authority was the Natal/KwaZulu Indaba. Various private and public sector bodies, community organizations, and political parties were invited to an Indaba to discuss the creation of a single, non-racial legislative body to govern the combined area of Natal and KwaZulu.

Unfortunately, and not unexpectedly, the far right and the radical left did not participate in the negotiations, although they were invited. It became obvious that the right wants to hang onto power and the left wants to take it. Neither is prepared to share it.

Eventually the Indaba has achieved consensus on a constitutional proposal whereby Natal/KwaZulu would become one non-racial federal state or province of South Africa. Since South Africa's constitution embodies a large number of second-tier authorities with a wide variety of powers, the Indaba's constitutional proposals could be accommodated with little legislative change, provided the region continues to receive its pro-rata share of the national budget.

What was the response of central government? During the negotiations the ruling party did not actively participate but was present as an observer. When the proposals were released in 1986 the initial reaction was negative. This did not deter the Indaba supporters, however. They embarked on an unprecedented education campaign to enlist support. The growing enthusiasm is probably a major factor in having changed the attitude of the ruling party. In September 1987 the Minister of Constitutional Development and Planning announced that he is not opposed in principle to a joint provincial legislature for Natal/KwaZulu. In November the State President P.W. Botha attended the opening of the multi-racial KwaZulu/Natal Joint Executive Authority, which he described as "an experiment that can succeed."

Natal/KwaZulu is well on the way to becoming South Africa's first non-racial federal state. It could become a shining example of a peaceful transition. It is also a good example of how the moderate and democratically-oriented middle-ground, which is normally silent and passive, can take the initiative in creating a desirable future.

The Indaba illustrates several principles of peaceful social change. Probably the most important lesson is that if people WANT to work together, separate structures cannot prevent them from doing so. The reverse is unfortunately also true -- if people do not want to cooperate, the most ideal structures will not force them to do so. If the Natal/KwaZulu Indaba leads to a just, peaceful, and stable future, it will be not so much the result of the constitution negotiated by the Indaba as of the people's spirit of goodwill, cooperation, ingenuity, and initiative.

Another lesson of the Indaba is that there is plenty of ground for agreement on many issues in the here and now, such as management of physical resources and economic infrastructure, without first tackling thornier issues, such as political power. By starting a process of joint decision-making in the areas where it was possible, enough trust and goodwill were generated to carry the momentum into political structures.

The Indaba also demonstrated that the principles of management and planning used in business can work on a larger societal scale. These principles involve the development of a shared understanding of problems and an agreement on what should and can be done about them (agreement on a positive, realistic vision). On the basis of this, strategies can be developed for actions that lead toward the realization of the desired vision. Strategic management also emphasizes the importance of implementing change by means of a continuous process and in an incremental way. Such a process is sustained by continuous communication and broad participation.

The initial planning meeting run by the Institute for Futures Research did generate the understanding, vision, and some broad strategic insights that set the process of cooperation into motion. Now we hope that by means of similar strategic exercises with other private and public organizations, we can make an important contribution to a peaceful social transformation of South Africa.

How to Make the Brundtland Report Come Alive

(by Niels Meyer)

(The following is excerpted from an address made by Niels Meyer to the Norwegian Parliament)

The first warnings about the environmental risks of the industrial development path were not taken seriously. It seems to be a typical human reaction to suppress unpleasant information. One way of doing that is to characterize the reports as doomsday prophecies created in the imaginations of environmental fanatics. However, the predictions have been confirmed by serious official reports worked out by government institutions, often in international cooperation. It does not seem likely that the staff in the governments involved should belong to a group of environmental fanatics. On the contrary, one would suspect them to be under the influence of the establishment and to favor traditional industrial development.

The latest of these reports is *Our Common Future*, published in the spring of 1987 by the World Commission on Environment and Development. The Commission had 21 prestigious members, chaired by Gro Harlem Brundtland, the present Norwegian Prime Minister. Its main message is that the course of the industrial nations must be changed now, if we wish to avoid a global ecological and social crisis. The Commission believes we still have time to choose a path leading to a sustainable global development. Whether we choose that path could depend on some nations quickly making binding commitments to the central propositions of the Commission. Obviously one of the nations most able and likely to make such commitments would be Norway, perhaps with the other Nordic countries.

I shall not attempt in this presentation to cover in a systematic fashion all the subjects treated in the Brundtland report. Rather I will permit myself to select a number of points which in my judgement are of special importance.

1. **Population.** The report repeats the need for family planning and the conditions for success in this field. In many parts of the world the population is growing at rates that are outstripping any reasonable expectations of improvements in housing, health care, food security, or energy supplies. The conditions for family planning are thus tied up in a vicious circle. Special attention is given in the report to the rights of tribal and indigenous people.

2. **Food Security.** The main thesis of the report is that global agriculture has the potential to grow enough food for all, but food is not available where it is needed. Hunger arises from lack of purchasing power rather than lack of available food.

The intensive farming methods in the industrialized countries produce food surpluses -- and environmental damage. The often inadequate farming methods used in many developing countries produce too little food -- and environmental damage. Some industrial food surplus has been sent at concessional rates to the developing world, where it has undermined the farming policies of recipient nations. The Commission recommends major land reforms and more effective incentive systems to encourage production of food crops.

3. **Loss of Species.** The Commission wants to establish the problem of disappearing species on the political agenda as a major economic and resource issue, and as a moral and ethical question. It recommends that forest revenue systems and concessional terms be reforms, and that an international "Species Convention" be established.

4. **Energy.** One of the worst criminals in environmental deterioration is fossil fuel burning. This results in the greenhouse effect, acidification, and general air pollution. The energy sector of the report contains the most precise and concrete statements. Some of them deserve to be cited at full length.

The Commission describes a so-called Low Scenario with a 50% fall in per capita primary energy consumption in industrial countries and a 30% increase in developing countries. "The Commission believes that there is no other realistic option open to the world for the 21st century. But this path would require huge structural changes to allow market penetration of efficient technologies, and it seems unlikely to be fully realizable by most governments during the next 40 years." At the same time the Commission suggests that an annual global per capita GDP growth rate around 3% can be achieved.

Unfortunately the report does not specify which countries should profit by this growth. Perhaps this was a controversial question within the Commission.

The Commission recommends that energy efficiency should be the "cutting edge" of national energy policies for sustainable development. It adds that most energy efficiency measures are cost effective.

For energy supply the Commission points to renewable energy sources. "The Commission believes that every effort should be made to develop the potential for renewable energy, which should form the foundation of the global energy structure during the 21st century." Concerning nuclear energy, the report reviews a number of serious problems but stops short of a clear conclusion. This again probably reflects a lack of agreement within the Commission.

5. **Industry.** The Commission points out that anti-pollution technology has been cost effective in terms of health, property, and environmental damage avoided. The Commission warns against the risks of new toxic chemicals and wastes and of major accidents. The Commission argues that transnational corporations have a special responsibility to smooth the path of industrialization in the nations in which they operate. The report, however, is not very explicit when it comes to means for making this responsibility operational.

6. **Human Settlements.** The world of the 21st Century will be a largely urban world. The report argues that the developing countries will have a major urban crisis on their hands. The Commission's recommendations are of a rather general nature and hardly sufficient to tackle the urban crisis.

7. **Call for Action.** In spite of the overwhelming catalog of problems listed in the Brundtland Report the general tone is rather optimistic. The Commission concludes with a call for action directed especially to the UN General Assembly to transform the report into a UN Program on Sustainable Development. But first and foremost the Commission addresses its report to people all over the world. It hopes that the report can contribute to a vast campaign of education, debate, and public participation.

The Commission underlines the importance of a basic change in attitude toward environmental and development strategies. It does not give detailed recommendations describing how this change could be realized. There is a need for further research and analysis that could illuminate the relevant driving forces and the necessary institutional changes. As an example of a project within this framework, I would like to call attention to the Nordic project, "Alternative Future."

The Alternative Future project attempts to establish and document an integrated social vision of a future society that is in good agreement with the goals of the Brundtland report. It would be natural to enlarge the scope of the project and make it into a full-fledged Nordic research program. This could include broad experiments with new structures of production and new lifestyles. As a special project the Nordic countries could demonstrate that it is feasible and advantageous to fulfill the requirement of the Brundtland report in the energy sector; to decrease energy consumption by 50% and to base supply on renewable sources.

(At this point Niels includes substantial information -- most of it familiar to Balaton Group members -- on the technical possibility of achieving this energy goal, including renewable sources, efficient appliances, co-generation, materials recycling, and ecological farming.)

The fate of the Brundtland report will depend to a large extent on whether it is taken seriously by political decision makers in the industrial nations. If not, it will not reach the attention of the public, and it will not have an impact on real-life development.

My proposal is that Norway and the other Nordic countries make binding commitments to some of the concrete recommendations in the report. There is already enough documentation of the technological realism of these recommendations. No blue-eyed idealism is needed to sign this commitment. It is one of the few policies that would be beneficial to the environment, the employment, and the foreign exchange balance. There is a special feature connected to the reduction of electricity consumption by 50%. It would give a substantial surplus capacity to Norway and Denmark, which would allow them to assist Sweden in phasing out nuclear power.

Perhaps the most important aspect of the Brundtland report is that it allows the environmental movement to bring its agenda to the official political level. They can no longer be discarded as "eco-fanatics." The risk is that the report will be drowned in well-intentioned words while traditional development continues toward global ecological crisis. If the Nordic countries do not recognize the importance of the challenge of the Brundtland report and act accordingly, I doubt that other industrial countries will.

This underlines the importance of a strong, concerted effort ranging from research and analysis through demonstration projects to binding political commitments.

Fat Dogs and Earthworms -- Indicators for Sustainable Agriculture

Chirapol Sintunawa says that when he wants a quick assessment of how well nourished the people of a village are, he looks at the stray dogs that hang around the temple. If the dogs are skinny and weak, it means the people are hungry and ungenerous. If the dogs are fat, it means the people have so much food that they bring some to the temple to share with the dogs.

Hardy Vogtmann says that when he wants to know the health of the soil on a German farm, he digs up a carefully-measured area of topsoil and counts the earthworms.

The Balaton Group is continuing its discussion of indicators for sustainable agriculture that we could actually measure in our various countries and report to each other and the world. Our purposes for doing this are:

- to document the extent and location of present unsustainability,
- to learn what technologies and practices are sustainable,
- to challenge present agricultural measures of success,

- to start an international discussion and flow of information on sustainable agriculture,
- to identify research and extension goals that will further the transition to sustainability,
- to publicize successes,
- to test and provide guidelines for others who want to establish, measure, and publicize such indicators.

At Balaton '87 we made up a long list of possible indicators of agricultural sustainability at both the farm level and the national level, and took them home to think about, winnow down, and test them for feasibility in our home countries. Thoughtful responses were written by Peter Aven, Diana Liverman, and Hardy Vogtmann. They all agreed that farm-level measures were much easier to deal with than national-level indicators. In fact Peter Aven writes, "as far as national farm system indicators are concerned, only about half the items on your list can be found in the USSR. Information on nutritional welfare of the population, on land and water use, and on ecological sustainability present the greatest difficulty."

The absence of national-level data on the adequacy and sustainability of food production is itself a topic for discussion. It certainly shows us where Balaton Group centers can begin to request, assemble, or publicize vital information! To begin to do that, however, we have to start with the farm level.

Hartmut Bossel and Joey Schaffner (of the Institute for Applied System Research and Forecasting in Hannover) have taken our initial list of farm-level indicators, along with all the comments sent by Balaton Group members, and are in the process of structuring the list, using orientation theory to be sure they cover all the basic orientors that define system viability. They will discover if we have concentrated too much on one orienter (such as adaptivity, perhaps, or efficiency) while ignoring another (such as freedom of action, or security).

Then they will discuss a revised, and hopefully shortened list, with Hardy Vogtmann to assess the feasibility of actual measurement of each indicator. Hardy is doing multi-year studies of many farms in Germany and has worked out protocols for consistent measurement of many agricultural factors (such as earthworm populations). They will come to the Balaton meeting in the fall with a final list, specified exactly as to units and methods of measurement, to be discussed in afternoon working sessions by all Balaton Group members who are interested in carrying out actual farm-level studies in their home countries.

We have started the search for funding to support monitoring activities as well as coordinating meetings for BG members taking part in the study. We hope to hold a workshop next fall or winter during which we acquaint ourselves with Hartmut Bossel's preliminary model of long-term agricultural futures for F.R.Germany, so we can adapt that model to our own countries and begin to coordinate farm monitoring with modeling.

The State of the World telecourse, which many Balaton Group members have heard about (some of you met Linda Harrar, its associate producer, at the last Balaton meeting) is finally launched into full motion. The telecourse was inspired by the Worldwatch Institute's *State of the World* books, though it will not follow the format of those books exactly. It will consist of ten hour-long television programs, a textbook, a student course-guide and a teacher's manual. Its subject will be environmental systems science, with emphasis on how human needs are being met, how resources are being managed, how the environment is being treated, and how to bring about a sustainable, sufficient world for everyone. It is geared to beginning-university level; it is also intended to be interesting to an adult audience on prime-time TV.

The telecourse is being produced by WGBH-TV, a prize-winning public television station in Boston, with co-production partners in India and Australia. Dana Meadows will be responsible for writing the textbook, her colleagues Jim Hornig and Colin High at Dartmouth will help with the study guide, and all of them, plus several members of the Balaton Group and many other scientific advisors will help the TV producers plan the series.

The telecourse will take about two years to produce. The final video and print materials will be made available to interested educators all over the world; discussions have been held with UNEP about making them available at little or no cost in the world's poorest countries.

The outline of the ten television shows at the moment (it changes and evolves over time) looks like this:

1. The History of the Environment Movement, the History of the Earth.

This unit is primarily about growth -- growth of social movements, growth of the human population and economy, growth of demands on and insults to environmental systems, also growth of opportunity, information, communication, and the human unity that might solve problems on a global level. Growth will not be presented as all bad or all good -- the emphasis will be on distinguishing between growth of different things at different rates, at seeing how various growing things affect each other, and at thinking through the future implications of present growth trends.

2. How the Planet's Systems Work.

How much growth can the earth support? This unit will present basic earth science and biological science to get across the idea of the planet as a fruitful, enormous, complex, self-renewing, self-maintaining system whose healthy functioning supports all life. The limits of this system will be explored, not as rigid limits but as dynamic ones. The limits are to the resilience of the system, its ability to maintain and repair itself. The disruption of the normal equilibrium of atmospheric gases, the ozone hole and greenhouse effect, will be discussed as examples of human impact on planetary resilience.

3. Poverty, Population, and Development.

Human society needs to be presented as two kinds of systems, rich and poor, industrialized and developing, partly separate, partly interdependent, both undergoing rapid change, one perhaps

evolving into the other. Both are internally-consistent systems, but neither is truly sustainable. This unit is about the dynamics and the human experience of poverty and of "development," where that word is examined carefully and defined many ways. Examples of both "top down" (e.g. the Aswan Dam) and "bottom up" (e.g. the Sarvodaya Shramadana movement in Sri Lanka) development processes will be shown -- examples that demonstrate strengths and weaknesses in both approaches.

4. Industrialization, Affluence, and Pollution.

Industrialization is "the solution" for the problem of poverty, but it creates another, different set of problems, both social and environmental. This unit will attempt to present industrialized society as a whole system, with its goods and bads, its comforts and culture and its pollution and alienation. It will investigate especially the management of the Rhine River and the problem of forest death in Europe. The unit will end with the question of possible futures -- are poverty and industrialization as we know them the only choices? That question leads directly into the following three units, which are about choices.

5. Choices for the Future I: Energy.

This unit contains a great deal of factual information about basic physics and geology and about energy supply and demand options. It will distinguish between the very different energy situations in the developed and developing worlds. It introduces the management concepts of end-use orientation and least-cost technology choices. It ends with a recognition that there are strongly opposing visions of possible and desirable energy futures, nuclear and solar, production and conservation, the hard and the soft path -- both of which will reappear in other guises in the next two units.

6. Choices for the Future II: Food and Agriculture.

The food situation is one of simultaneous, persistent hunger and glut, both of which are enormously expensive in economic, environmental, and human terms. This unit lays the scientific foundation for discussing the food problem with the basic science of soils and crops, predators and pests, and the effects of agriculture on the environment. Then it goes into the nature of the system structure that produces hunger and glut and into proposed solutions, both technical and social. Again, opposing visions come up, from biotechnology to organic farming; people are actively creating these visions on the land; we can watch and measure and test them.

7. Choices for the Future III: Materials and Waste.

Materials flow through our lives primarily in a straight line from source (mine, forest, field) to sink (groundwater, soil, air, ocean). But the planet works in ever-renewing cycles. The lack of congruity between these systems leads to depletion at one end of the materials flow and waste accumulation at the other. Again, there are opposing hard- and soft-path visions of how to deal with our materials problems -- municipal incineration vs. municipal recycling, biological sewage treatment vs. chemical sewage treatment, hazardous waste disposal vs. industrial recycling.

8. Remnants of Wilderness.

Should we drill for oil in the Arctic National Wildlife Refuge? Should land be reserved for tropical forest when starving people need farms? When does a wilderness stop being a wilderness? How much wilderness is enough? This unit presents the ecology of biomes, the importance of genetic diversity, and the costs and benefits of wilderness restoration as well as preservation (an example of restoration would be David Wingate's reconstruction of the original biota of Bermuda; of preservation would be Costa Rica's national park system). It ends with moral questions about the value of wilderness for human purposes, and for its own sake.

9. Managing Nations on Two Continents.

The previous four units have broken the integrated picture of the social, economic, and environmental system into subtopics and separate issues. The next two units move back to integration and to questions of policy choices and system design. This unit looks at the problems confronting nations on two continents, Africa and Asia, and at the solutions they are employing. (Tanzania and Thailand might be taken as examples, or Nigeria and China). It looks at how governments are forming and coordinating policies on population, economic development, energy, food, wilderness, etc. The idea of carrying capacity as a complex, dynamic interaction between populations, lifestyles, technologies, and ecosystems is introduced. How much room do densely populated Asian nations have to maneuver? How much more absorptive capacity do the apparently fragile ecosystems of Africa have?

10. A Sustainable, Secure World.

The first half of this unit explores the possibility for action at the global, the second half at the individual level, with emphasis on the connections between the two. It will portray successful international negotiations such as the Montreal Agreement on the ozone layer and the Mediterranean Action Plan. It will also show individuals and families who are concerned about environmental issues, how they live their lives consistently with their beliefs, and how they see themselves affecting, or failing to affect, national and global decision-making. The chapter will examine the traditional definitions of the concepts of sustainability and security and work toward systematic definitions. It will present the option of a sustainable, secure world, not as a sure thing, but as a definite possibility.

Comments and ideas about this rough outline from any Balaton Group member will be welcome -- please send them to Dana Meadows.

News from the Members

In Singapore the first week of April the Systems Research Institute of Pune convened a workshop on Sustainable Future Modelling with participants from Bangladesh, Sri Lanka, Malaysia, Indonesia, Philippines, China, and Singapore. The organizers were **Jaswant Krishnayya**, **Anupam Saraph**, and **Atul Potdar**. Among the faculty were Balaton Group members **Malcolm Slessor**, **Dana Meadows**, and **Martha Garrett** (of **Jerry Barney's** Institute for 21st Century Studies). The participants, experts in such fields as economics, demography, forestry, and ecology, were energetic and enthusiastic. They played the fish game and STRATEGEM late into the night, after long days of lectures and discussions. Several of them brought along and explained their own computer models of

regional development, some of which Anupam and Atul were able to implement on Toshiba lap-top computers. The workshop not only served to convey many of the basic systems principles of sustainable resource management, it also was an important step in strengthening the network of concerned and active whole-systems long-term thinkers in South and Southeast Asia.

Dana Meadows followed up her trip to Singapore with a three-week odyssey to several INRIC centers. She spent six days with **Chirapol Sintunawa**, meeting with the faculty and students of the Faculty of Environmental and Resource Studies at Mahidol University, and accompanying **Chirapol** and **Sumalee Thepsuwan** on a trip to the Thai countryside to do test interviews of Thai farmers.

After a brief stop at UNEP in Nairobi to deliver the manuscript of a new book on environmental education, she went on to Tanzania, where **Athanas Kauzeni** and **Eli Shishira** were gracious hosts. She visited their Institute for Resource Assessment and saw a little of the city of Dar Es Salaam, including its intriguing and potentially disastrous problem of beach erosion, perhaps caused by dynamiting the coral reefs as a cheap way of catching fish.

The next stop was Kassel in West Germany, where **Hartmut Bossel**, **Karl-Heinz Simon**, and **Heiner Schaefer** introduced her to the many fascinating ways the Center for Environmental Systems Research is using computers to understand the environment. They include a simulation model of tree growth under acid-rain stress, which is now being extended to a forest model, and a new experiment in testing various programs in expert-systems, to see how useful they might be in organizing knowledge of environmental systems. **Dana** and **Hartmut** also spent a day with **Hardy Vogtmann** discussing the Balaton Group project on sustainable agriculture and visiting Hardy's demonstration organic farm near Witzenhausen. They also visited **Hardy's** composting station, where the organic garbage of 60,000 persons in the Witzenhausen area is made into high-quality compost for gardening and farming.

The trip ended with the INRIC Steering Committee meeting in Switzerland at the home of **Joan Davis**.

Anupam Saraph is the proud father of a new daughter named Sphurti, meaning inspiration. "It sure is wonderful to discover yourself and the world afresh with her! She talks a wonderful language which says much more than mere sound."

Anupam reports that SRI has developed its own DYNAMO compiler over about 10 months of work. "There is much we need to do to make it distributable, but that (I hope) is only a matter of time. We also had an exciting interaction with **Bert's** colleagues from IVEM and could manage to approximate the Future Voltage game for Maharashtra State."

Anupam, together with **Jaswant Krishnayya** and another co-worker Shripad Dharmadhikary, has also assembled with a personal computer desk-top publishing program an excellent short book called Sustainable Futures: An Information Map, which is a powerful introduction to what sustainability means in such fields as population, energy, agriculture, water use, forestry, and industrialization. He promises to bring copies for us to see at the next Balaton meeting.

Chirapol Sintunawa has just completed his new house in a mango and coconut grove on the bank of a river outside of Bangkok, not too far from the Mahidol University's Salaya campus. He has declared it to be the fourth branch of the Balaton Hotel Chain (claims to the first three branches have been made by **Joan Davis** in Toessriedern Switzerland, **Dennis** and **Dana Meadows** in New Hampshire USA, and **Hartmut Bossel** near Kassel FRG). The first Balaton Group guest to cross the

threshold of Chirapol's nearly-finished house was **Dana Meadows**; the first to stay in the finished house was **Malcolm Slessor**.

Chirapol is pleased to announce that the Thai government has decided not to build the Nam Choan Dam on the River Kwai in northwest Thailand. Chirapol and his colleagues have worked for years to defeat this dam, along with thousands of Thai people who would have been negatively affected by it. It would have brought salt-water infiltration to coastal farmers, displacement of their homelands to upland people, increased threat of earthquake in a fault zone, and the loss of one of the last unspoiled tropical forests in Thailand -- and if the performance of other dams in the area is an indicator, it would not have filled properly, not have provided the promised irrigation water, and sent electricity only to the city and not to the local people who suffered the costs of displacement. Chirapol can still provide collectors' item T-shirts saying "Stop Nam Choan Dam" in Thai or English to interested inquirers.

Chirapol has received a major contract from the Thai government to study energy use in Thai agriculture. The contract will require extensive interviews with growers of Thailand's six major crops, assembling valuable data on the use of machines, draft animals, fertilizer, and pesticides, as well as general farming practices. The study will take two years.

Joe Alcamo will be married on June 11 to Barbara Luebker, a fellow air pollution scientist from West Germany. As one anonymous member of the Balaton Group commented, "we're not losing a brother, we're gaining a sister."

Samaresh Chatterji writes, "I have left my position at Systems Research Institute, Pune, to join the School of Management & Computer Studies at the Maharashtra Institute of Technology (MIT Pune). This is a new school, with the serious aim of becoming an institution for excellence in management education, rather than just a diploma-granting mill (of which there are many in India). Of course, the beginnings are small: thirty students and two full-time faculty members in a corner of the College of Engineering. My areas of responsibility would be quantitative methods and modelling, information systems, and computer applications in general."

"I hope that INRIC has some category for former staff of INRIC centers who, like me, have become convinced on the necessity of working for a sustainable future. For the time being, my direct professional involvement in this work will naturally be somewhat limited, but there are many small ways to spread our ideas, and hopefully in time there will be opportunities to work on relevant projects."

"As I have many warm memories of my one visit to Balaton in 1985, I would like to remain in touch."

Wim Hafkamp will soon leave his institute to develop a new environmental division within a consulting company in the Hague, Netherlands.

Dennis Meadows will resign his professorship at Dartmouth effective August 31, 1988. Then he will move to the University of New Hampshire where he will become Professor of Systems, Policy, & Management within the Whittemore School of Business at the University. His principal responsibility will be to design, implement, and lead a major new institute that the University has decided to create as a new center of excellence on the campus. The Institute for Policy and Social Science Research will grow into a significant center for research, consulting, and continuing education. Its principal focus will

be on problems of the northeast United States, but the institute will also provide a basis for Dennis to make much larger contributions to the INRIC program.

Dennis has received a Fulbright Fellowship to support two months of work in the USSR with **Victor Gelovani**. They will be designing a new training center to be operated by the Soviet government on behalf of Third World nations. This center will adopt the INRIC sustainable resource workshop curriculum and offer it in English on a regular basis to senior public officials from the developing world. The project is funded by a grant from the United Nations Environmental Institute.

Csaba Csaki has been appointed a member of a new, independent committee to investigate problems of chemical pollution in Hungary. The findings of the committee will probably lead to new approaches to industrial waste management.

Niels Meyer presented speeches on the Brundtland report not only to the Norwegian government (as excerpted in this *Bulletin*) but to a United Nations session on new and renewable energy sources in New York. A result of the U.N. discussion is a possible international network of centers working on renewable energy. Niels is on a 5-person steering committee to implement this proposal. He has also joined the board of the Danish chapter of Greenpeace.

Wouter Biesiot of IVEM reports that the Dutch government will probably fund a joint study on electric power planning in Southeast Asia, which has arisen out of joint work between IVEM in Groningen and the Systems Research Institute in Pune. The game Future Voltage will be used as a planning tool. Future Voltage will also be presented at the conference of the International Simulation and Gaming Association in August in Utrecht. In December of this year there will be a celebration of Groningen's 375th anniversary, which will include a symposium on nature management and sustainability -- IVEM will conduct a STRATEGEM game for 100 players!

Tamas Jaszay's committee for the World Energy Conference has finished its report on the rational use of energy in agriculture. The report is now available from the WEC with interesting data from many different countries. The committee will next address energy problems in developing countries; Tamas says this will be a good opportunity to acquaint people with STRATEGEM. The Technical University in Budapest is restructuring its teaching activities. There used to be a major in energy production; now there will be one in energy conservation under Tamas's leadership. There will also be new courses in resource management and energy policy and a new major in environmental protection.

Joan Davis has become a regular television star on various European networks, talking about environmental problems and sustainable and healthful lifestyles. She is working with the BBC and the Swiss television on providing consumer information on energy conservation, air pollution levels, radioactive wastes, and other information that needs to be made clear to the public. She also is getting together a team to reveal suppressed information, such as infrared pictures of electrically heated tram tracks and parking lot surfaces at a time when power companies are claiming the need for more nuclear power. Joan says that EAWAG, the Swiss Water Resources Institute is thinking of expanding to become an Environmental Protection Institute. Her own research these days is on the ratio of

geochemical components in the surface water and the groundwater, as an indicator of the use of agricultural chemicals and of the incidence of acid rain.

Amory Lovins sends a long letter about his recent trip to Soviet Georgia, where he and a team of American architects, energy experts, and educators worked with **Victor Gelovani** and a group of Georgian architects to design the first energy-efficient buildings in the Soviet Union. The buildings will be part of an international children's camp. "We established a close bond with the Georgian team, which is as creative as any we've met anywhere; examined and made recommendations on two gorgeous sites; checked design criteria with Georgian children; began conceptual design; arranged for detailed design to be done during a reciprocal visit of the Soviet team to Colorado this August....We worked closely with Victor Gelovani and three of his staff people from the Institute for Systems Studies in Moscow -- people of remarkable personal as well as professional quality. All will remain closely involved, probably including the visit here in August. We all like each other enormously."

"I returned to Moscow 10 May for a two-day global-warming meeting, cosponsored by Robert Redford's Institute for Resource Management, the National Resources Defense Council, the National Center for Atmospheric Research, and the USSR Space Research Institute, and hosted by the Soviet Academy of Sciences. I introduced participants to Bill Keepin's new work on why nuclear power makes the CO2 problem worse, introduced leading Soviet climatologists to energy-saving opportunities, and had useful technical meetings. We all agreed on the seriousness of the climatic problem and explored what to do about it. Options will be explored in depth at a larger, more substantive conference which Redford will host this fall at Sundance. In a world where the US and USSR alone account for over half the CO2 emissions, and a handful of others (China, Brazil, India) for much of the likely increase, I feel more strongly than ever that we can do a great service at low cost by quickly getting our energy-saving information to key countries."

Announcements

The Global Studies Center in Washington DC has changed its name to the Institute for 21st Century Studies. Its address, telephone number, and basic mission remain the same; to facilitate teams of researchers in producing long-term, large-system studies of their countries' futures. The Institute now has a European office as well, run by Co-Director Martha Garrett. Here are the relevant addresses:

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Ambio, volume 16, no. 5 (1987) ran a lead article by Joe Alcamo, et al. on "Acidification in Europe: A Simulation Model for Evaluating Control Strategies". Reprints are available from IIASA as Research Report-88-2, January 1988.

STRATEGEM-1 is now available in professionally-manufactured sets from Dennis Meadows. Each set includes:

- a sturdy plastic suitcase to hold all the materials for four games,
- video cassette with an 8-minute film showing the purpose and mechanics of the game,
- computer diskette,
- originals to use in xeroxing copies of all materials used by the players in the game,
- originals for use in creating a set of slides or overhead transparencies for introducing and debriefing the game,
- four boxes, each with a folding, rigid game board and markers that are color coded and stamped with numbers indicating their value, and
- a 100+ page teacher's manual with many new materials to assist in running the game and building lessons on its principal points.

This set is available either in English or in French versions; blank boards are available for use in creating custom versions with other languages. The cost of these sets is \$200 plus shipping.

Stories, Quotes, and Jokes (Mostly Jokes)

"In the twentieth century, the glory of the humans has been the desolation of the earth. The desolation of the earth is becoming the destiny of the humans. All human institutions, professions, programs, and activities must be judged primarily to the extent that they inhibit, ignore, or foster a mutually enhancing human-earth relationship."

Thomas Berry

"Whenever people say, 'we mustn't be sentimental,' you can take it they are about to do something cruel. And if they add, 'we must be realistic,' they mean they are going to make money out of it."

Brigid Brophy

"Liberty means responsibility. That is why most men dread it."

George Bernard Shaw

"We don't inherit the land from our ancestors, we borrow it from our children."

Pennsylvania Dutch saying

"Humanity is like people packed in an automobile which is traveling downhill without lights at a terrific speed and driven by a four-year-old-child. The signposts along the way are all marked 'progress'."

Lord Dunsany

"When Health is absent
Wisdom cannot reveal itself,
Art cannot become manifest,
Strength cannot be exerted,
Wealth is useless and
Reason is powerless."

Herophiles (300 B.C.)