

NATURE IN FOCUS

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FOR NATURE CONSERVATION

COUNCIL OF EUROPE

EUROPE'S CHANGING LANDSCAPES



NATURE IN FOCUS

Editorial	Olivier Reverdin	1
A world view of conservation	Dr Gerardo Budowski & Robert I Standish	2
Local authorities and nature conservation	Dr Walter Münch	6
Europe's changing landscapes	FG Breman	9
Conservation of coasts	Professor JA Steers	10
Pollution of the sea		14
Wetland in the natural landscape	GVT Matthews	17
News from Strasbourg		21
Short notes		22
Nature in Focus looks at books		27
Zusammenfassungen (German summaries)		28

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EDITORIAL



OLIVIER REVERDIN
President of the Consultative Assembly
of the Council of Europe

European Conservation Year is ended. The time has come to assess results. There is no doubt that in 1970 Europeans gained greater awareness of the dangers to which man exposes himself by defiling and changing his natural environment. This was the object of the exercise. It has been attained.

To be sure, for many years past far-seeing people have been aware of these dangers and have endeavoured to combat them. They drew public attention to the pollution of rivers, lakes, underground water, sea shores, the air. Laws have been made. Purification plants have been built and measures taken to protect animals and conserve species threatened with extinction. Proposals have been made for national planning, the extension of nature reserves and the conservation of landscapes and buildings of historical interest. It would not be true to say that nothing has been done.

But the steps taken have been mostly of a local or regional nature; the scattered measures introduced have been of only limited effectiveness. Public opinion was slow to react and the individual continued to act according to the principle 'everything down the natural drain'.

The situation has changed radically due to the many campaigns organised in all European countries during European Conservation Year. Thanks to the echo given to them by the press, radio and television and the unequivocal and courageous position taken by statesmen, public opinion has been alerted. No European can henceforth be ignorant of the fact that his environment has deteriorated seriously and continues to deteriorate and that this is leading to catastrophe. Everyone also knows that there is a remedy. Everyone is ready to ask, nay to demand, that the battle to save our environment be joined without delay.

A minister of finance said recently: 'It is going to cost a lot, this European Conservation Year'. This is stating the problem wrongly. The price to be paid is that of a long want of foresight. It is better to pay now. The longer we wait, the dearer it will be. By hastening realisation of the problem, European Conservation Year will ultimately have helped to lower rather than raise the price to be paid for the conservation of the environment.

This price will be very high: between 3% and 4% of the gross national product, say the experts. This is on the level of military expenditure. It is high, but it is bearable.

How should the burden be distributed? Some think that the State should assume the whole of it. This would be neither possible nor equitable. There is no reason, for example, why the motorist should not bear the cost of the apparatus which, tomorrow, will eliminate most of the carbon monoxide

emitted by his engine. In general the intervention of States is, however, essential, yet it cannot be really effective unless States confer with one another and take joint action. The dimensions of the problem are not national but international; the conservation of nature and the environment in Europe is the concern of all Europeans, of all governments. Pollution and nuisances ignore frontiers. In many fields European standards must be established: this applies to detergents, pesticides, herbicides and chemical fertilisers, which are carried into streams, rivers, lakes, seas. It also applies to the noise of aircraft which fly over our land and to exhaust gases from the ever-present motorcar. If we do not agree on what is tolerable and what is not, we shall have anarchy, the source of inefficiency. The same applies to the costly scientific research which must underlie environmental conservation measures. For implementing these, individual European countries have neither sufficient scientists nor sufficient funds, not to mention the overlapping and waste that separate action entails.

The great merit of European Conservation Year is that it has provoked general and sudden awareness by all the peoples of the Continent (the repercussions extend beyond the frontiers of the seventeen member States of the Council of Europe) to the threat which uncontrolled technical progress constitutes for the natural environment in which they live. This is only a beginning. But it was necessary to begin in this way. It now rests with governments to take action and with public opinion, duly alerted, to spur them on to ensure that they act, and act in concert.

A WORLD VIEW OF CONSERVATION

by Dr GERARDO BUDOWSKI
Director General,
and

ROBERT I STANDISH
Information Officer,
International Union for Conservation
of Nature and Natural Resources



1970 has often been called the year of the environment. And so it has been, in many respects, for the environmental conscience of the world seems at last to have stirred, if not fully awakened. In our view, this is major progress indeed and without any question, ECV-70 had much to do with it.

Growing awareness

Most people, and most nations too, have grown up thinking that nature is an inexhaustible cornucopia (remember the old symbolic figure of Mother Nature with the horn of plenty?); that rivers are intended to be used as sewers; that the oceans are so vast that nothing man does can harm them; that man's technical and scientific capability is so great that any of his knowing and admitted mistakes can be repaired, and that substitutes can easily be invented or developed for the raw materials he uses with such profligacy. Now mankind — or a good part of it — knows these assumptions are false, at least in the world as it is today. Intelligent men know that the

world is finite, and fear that the race to develop and exploit and grow may take us over the threshold of nature's tolerance, beyond the point of no return.

The horn of plenty symbol seems a cruel joke to the 2 billion or so people who all their lives are hungry and undernourished. Pollution and poisons spread around the world have produced painful and ugly evidence of our carelessness. Once-rich fisheries now produce only marginal harvests. The threat of extinction grows for many species of animals and plants. Development schemes, done in the name of 'progress', often result in ecological disasters. Urban ills multiply, and the pursuit of 'quality of life', whatever it may mean to different

social groups, is ever more remote to most people.

Recognition of these conditions has brought even louder calls for growing action to reverse the trend. Although only beginning, the signs and portents are hopeful that before many years have passed a substantial number of the nations will adopt policies that indeed can reverse destructive trends and can improve the quality of life for mankind, at least in terms of healthier, more productive environments.

The impact of the last two years

What are some of these signs and portents?

European Conservation Year 1970 is

one, of course, the results of which give cause for considerable hope. Conservation more and more involves communities of nations, for the problems in large part are international. Thus the continuing effort of the Council of Europe in this field deserves all the support it can get and will no doubt be of major importance to Europe, and a guide to other industrialized regions of the world. But of course it is far from sufficient in the light of increased deterioration. The message has, moreover, not reached many of the developing countries who look enviously at the European countries — with or without pollution!

Another positive sign is recognition in the world community, through agencies in the United Nations family, and the UN itself, that broad action is needed, beyond the extensive scientific and conservation work that has always been a substantial effort in the programmes of FAO, UNESCO, WHO, WMO and others.

The far-reaching 'Biosphere Conference' held in Unesco in 1968 was a great step forward, and the resulting inter-governmental, long-term Man and the Biosphere Programme, adopted in 1970 as a logical outgrowth, and to be coordinated by Unesco, will provide steady scientific support for rational policy decisions in environmental matters.

The United Nations Economic Commission for Europe has long recognized that industry and development have a strong relationship with problems of the environment and has studied various aspects in great depth. It mounted a major inter-governmental conference at Prague in May this year, which explored these problems and relationships and charted corrective action.

And the United Nations itself is heavily involved in planning for the UN Conference on the Human Environment, which will be held in Stockholm 5 - 19 June, 1972. Hopefully, this meeting of nations will produce important initiatives and agreements for a concerted world-wide attack on the problems which must be solved.

The Special Committee on Problems of the Environment (SCOPE), an example of international non-governmental programmes and an outgrowth of the successful International Bio-

logical Programme, is another activity that will undoubtedly contribute to the inter-governmental effort. It is also heartening to see such 'pressure groups' as Friends of the Earth, which had such a successful start in the USA, expand into European countries. Unofficial groups can recommend and carry out actions that, for a variety of reasons, could not be considered by inter-governmental organisations.

They fulfil, therefore, a complementary role in exposing facts and bringing them to the attention of the public in a most forceful way.

In international development, the World Bank now makes an ecological evaluation part of its process of considering loans for development projects. This kind of evaluation is being fostered more widely, and IUCN is working, with others, to provide scientific criteria for the agencies concerned.

This short review is incomplete, of necessity, but it is clear that we live in a world that is waking up to the challenge of a finite world that must be managed carefully. Little by little we are admitting that concerted world-wide action is essential to reverse the dangerous trends, and steer us around the many pitfalls in our path.

Individual action

What can each of us do?

This question is often asked but specific advice is not easy to give.

Perhaps the most important basic action for all individuals is to learn to see the biosphere as a whole unit, a 'system' or ecosystem, as scientists qualify it.

Recently in IUCN we have tried to bring this notion to the attention of the public by comparing the biosphere — the thin layer of air, water and soil on the globe's surface where life exists or could exist — to a large house, a house that cannot be expanded. All humanity must live in it, while adding more people to fill up its space and consuming the resources in the cellar and pantry. Are we taking care of this house, tending it, repairing it whenever necessary? Do we act all together, as a good custodian, to keep the house clean and functional? Or can we afford to let it degrade, fill up with dust and dirt and wastes? Can

we tolerate the loss of physical and mental health that will also come with such degradation?

This simple presentation, perhaps somewhat naive, can be adapted to different cultures, audiences and situations. It is clear that we can keep our house in order only with support from all the people for the general principles involving biosphere management on the global, regional or local scale.

Then there is the population problem. Can we really afford to look away? Admittedly, birth control as yet, is far from being widely practical, acceptable or economic. But this does not prevent anyone from understanding that it is not possible for populations to continue to grow at the present rate. What about the millions of unwanted children born every year? Can we afford simply — and may I say stupidly — to divide the total area of a country by its inhabitants and draw conclusions that it is underpopulated? Can we reasonably expect deserts or extremely arid regions, icy regions, or tropical rain forest areas with a very delicate soil-tree relationship, to be opened up by large-scale human occupation schemes, often 'sold' by reassuring words but usually resulting in utter failure?

It is incredible that such simple facts are ignored by large sectors of the population and this ignorance is often exploited by some unscrupulous leaders. Is it known, for instance, that the population growth would be drastically reduced in many countries if unwanted children were not conceived?

Individual actions from the point of view of the consumer have not yet attained very effective results. While we can do something by not using plastic bottles, dangerous detergents or pesticides, and by riding bicycles instead of cars to avoid air pollution, can we really expect this to produce effective action if the majority of our citizens do not follow suit? Some consumer-guides to the impact of these things on the environment have been published but it is left mostly to the individual to follow or ignore them. How can we make certain they are followed? By persuasion alone? By imposition?

Obviously the greatest possibilities here reside in group action, be it on a local, national or world basis.



Carving up the tropical forest: first step, a road to bring out the trees. Forest clearance, followed by erosion, has impoverished many temperate regions. The danger is even greater in the tropics. Responsibility for conserving such resources must now be shouldered by all nations.

Rune Hassner / Tifoto

Group action

Some very successful effects have been achieved in some countries but they are far from enough, viewed in the light of global requirements.

In the United States, for example, where leadership in conservation has been demonstrated for all the world, but also where environmental deterioration has progressively deepened, a number of major steps have been taken. Exemplary legislation has been proposed, and important measures dealing with conservation and pollution control have been adopted. Environmental quality has been made a part of policy-making at the highest levels. Sensitivity to environmental values is increasing, and it is worth noting that some projects (in a country famed for physical developments to support or promote economic progress) have been cancelled because of the potential ecological damage they would cause, though, of course, they were not ended without a fight.

The damage of persistent pesticides has been viewed with alarm by an increasing number of nations, and sale or use of some of these substances has been forbidden.

Virtually every country where industry is a major activity has taken some unilateral action toward correction of pollution. Some of these steps are palliatives, but at least the problems are not totally ignored.

There has been a marked increase in the creation of National Parks and equivalent reserves — which is a vital part of the effort to keep our genetic and environmental options open for the future. Just in the last few months new parks have been created in Portugal, Canada, Costa Rica, Democratic Republic of the Congo, Federal Republic of Germany (see *Nature in Focus, autumn 1970, pp 21 & 22*), Netherlands and Surinam. More are coming, and international studies are under way through the efforts of FAO, IUCN and IBP and other agencies to survey carefully important biological resources, of which parks make up a large part.

Mining is often destructive of environmental values, and its consequences have been ignored for centuries. But surface mining need not leave terrible scars, as has been shown in Germany.

From coal to cows
Strip-mining need not leave ugly scars permanently on the landscape. Waste from a coal strip-mine, levelled and with the topsoil restored, provides productive grazing for cattle.



USDA / Soil Conservation Service

England is now moving to eliminate some of her derelict lands, and in the USA, an effort is underway in the state of West Virginia to ban strip coal mining.

There is an awakening to the need for protection of declining species. Recently the International Fur Trade Federation, working with IUCN and the WWF recommended a ban on trade in the skins of four spotted cat species, two otter species and tigers (see *Nature in Focus, autumn 1970, p 22*). Tiger shooting has been banned in India. Import of vicuna wool is now forbidden in the UK and USA (see *Nature in Focus, spring 1971, p 26*), while the great whales have been added to the USA's endangered species list — which means that products of these marine mammals cannot be imported.

The greatest future lies undoubtedly in global action.

Like it or not, every country must recognise that the world is calling into question the idea of absolute national

sovereignty over resources such as air and water whose management or mis-management affects the rest of the world (see p 22). Doubtless, answers to this question will be the prime responsibility of inter-governmental organisations working in close cooperation with responsible non-governmental groups whenever this is most useful — and there are many instances where such joining of efforts results in most effective actions.

One of the results of such a world view would make it logical that small non-industrialized countries protest and demand corrective action if the industrial giants pollute the world through abuse of natural resources such as demands on minerals, air and water. It would be equally fitting that many countries of the world protest large deforestation schemes in non-industrialized tropical countries with high rainfall. In the long run, such interdependence should make technical assistance more effective, not so much to aid individual development

schemes of certain countries but to assist indirectly by promoting wiser world management of resources and their conservation, maintaining diversity and the choice of options, and ultimately favouring all the countries of the world. Such philosophy is likely to generate resistance but it appears indispensable in the long run. Unfortunately the signs are all too clear that, as more frequent and more violent 'eco-catastrophes' remind us continually, there are not many options when survival is at stake.



'Is there a mayor who is not proud ...to hold up a balance

LOCAL AUTHORITIES



Nature Conservancy

'I believe we must recognise that concern for nature, for the countryside, for the environment... on which we as municipalities exert our influence day in day out, year in year out, is a highly important element of the welfare responsibility of local authorities. Is there a mayor who is not proud... to hold up a balance sheet showing how many thousand houses he has built and how many miles of road he has constructed? What he omits to mention is how many acres of meadows and woodlands he has transformed into lifeless areas excluded from the natural ecology which supports and nourishes not only mankind but all life on this earth.'

These words were used in an attempt to define the conservation problem for local authorities at their 8th European Conference in Strasbourg last year. A Nature Conservation Declaration for Local Authorities in Europe was one of the main results of this Conference. The European Conference of Local Authorities, made up of 150 leading local government figures, has played a significant part in the Council of Europe's nature conservation activities. Local authorities hold the key to practical and effective day-to-day environmental management. They alone have detailed knowledge of the land uses and resources, and the needs and aspirations of the people in their area. They operate the planning, housing, highways, public health, recreation and education services which determine very largely the quality of the environment in town and country and people's attitudes towards it.

Local authorities are, after all, faced most directly with the threats to the environment of their areas presented by modern civilisation. Traffic fumes

and noise, smoke and effluent, the ever-growing mass of refuse, the pollution of water supplies, all call for action by local authorities. It is from their local authorities that people demand better housing, more schools, more roads to cope with their increasing mobility. The inevitable conflicts in this situation, especially in the face of scarce resources, lead to the risk that the more tangible social projects will take pre-eminence. But these conflicts are between equally important aspects of the same aim: that is, the constant improvement of man's physical and social environment. Local authorities, with their unified control over so many of the services governing the quality of that environment, can resolve these conflicts at their own level. *Concrete action at local level is of much greater value than exhortations by an external agency which has not the advantage of the local council's close links with its electorate.*

It was in this conviction that the European Conference of Local Authorities drew up its 11-point Nature Conservation Declaration. And it is in this conviction that local authorities are urged to adopt the Declaration publicly and to implement it to the fullest extent possible. The Declaration sets out the practical steps a local authority can take both as planning authority, landowner and developer, and in the context of its educational and community development functions. In particular it states that the local Council will draw up a detailed inventory of the natural resources in its area for use as a basis in planning, that it will encourage the establishment of nature reserves and the reclamation of derelict land, and that it will collaborate

sheet showing how many houses he has built ...

and nature conservation



fully with other public authorities and industry to combat pollution of all kinds.

In addition, a local Council adopting the Declaration would state its intention to launch an educational campaign, including in particular the organisation of an annual 'Conservation Day' aimed at the general public. Finally, to ensure continuity, a local nature conservation committee including qualified experts would be set up.

In discussing the Council of Europe's work with local authorities, mention should be made of the Intergovernmental Committee on Cooperation in Municipal and Regional Matters. Representatives of Ministries of the Interior or Ministries of Local Government from the 17 member States of the Council of Europe meet in this Committee. It is studying, among other things, the problems of rural depopulation and rural revival in the balance between town and country, and the economic and social problems of mountain regions. It is also arranging for exchange, between ministries and government agencies, of documents, reports, laws and regulations relating to local government. In this work nature conservation will be stressed in recognition of the unique contribution that local authorities can make to the management of the natural environment in their area.

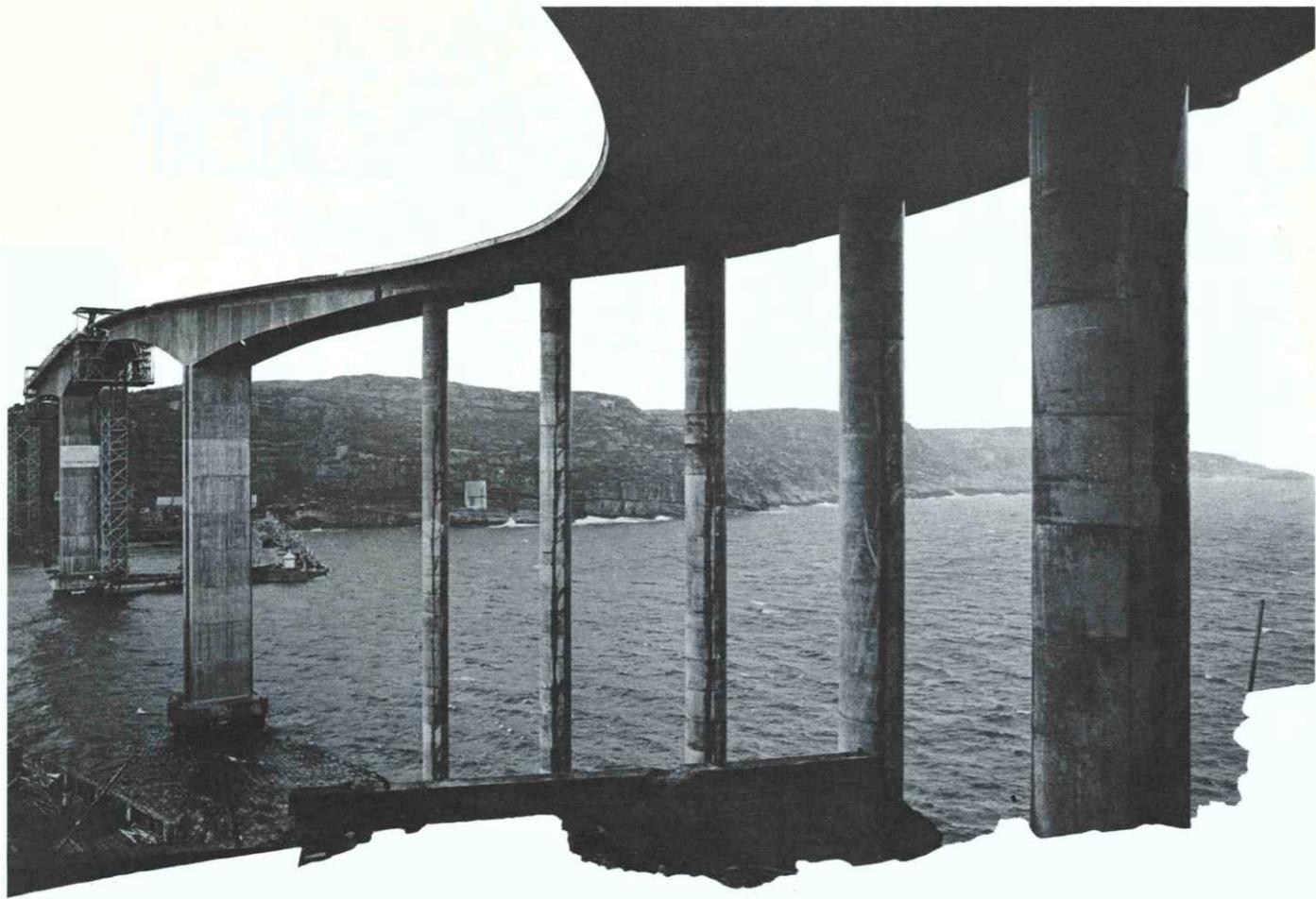
Lastly, we can refer to the European Conference of Ministers responsible for regional planning held in Bonn last September (see *Nature in Focus* no 8 spring 1971 page 22). The quality of the environment figures prominently in the Ministers' final resolution, which sets out the foundations for a European regional planning policy. Paragraph 13 states:

'Regional planning can make an important contribution to the creation or preservation of a proper environment. It makes it possible to control the various factors which can make or mar the quality of the environment. It has a special advantage of being able to do away with or mitigate the consequences of certain forms of pollution and to prevent any deterioration in the environment. Finally, it enables the community to draw greater benefit from the limited natural resources that are at its disposal.'

It is clear from these brief references to the Council of Europe bodies working in the local government and regional planning fields that European Conservation Year 1970 has made its mark at their level. Rational management of the natural environment has rightly been recognised as being a European task, and one which must be seriously tackled by governments. Resources must be mobilised and the impact of European Conservation Year 1970 on public opinion must be maintained and enlarged upon. But, for practical day-to-day environmental management, action by governments is not enough. It is on local authorities, and on their willingness to experiment and innovate, that the success of this operation ultimately depends. The European Conference of Local Authorities is determined to see that this responsibility is brought home in all the regions, towns and villages of Europe.

Dr WALTER MÜNCH,

Wangen-im-Allgäu,
Federal Republic of Germany
Rapporteur on Regional Planning and
Development to the European Conference
of Local Authorities



Thore Johnson / Tiofoto

Except for the tops of the highest mountains and some of the more remote regions, most of Europe's landscape is man made. The downs and heaths and farmland, the 'countryside' with which we are so familiar, have been shaped over the centuries by man's activities. Today these activities are accelerating the rate of change. Will the new landscapes be better or worse? Which factors will have the greatest impact? Can this impact be controlled? Can an individual landowner do anything in the face of today's economic forces, to ensure the patrimony of his heirs. Can planners contribute to the good husbandry of the land? These are some of the questions to be answered in the series of articles on Europe's changing landscapes begun in this issue and introduced below by **FG Breman, Secretary General of the International Federation of Landscape Architects**. These articles will review the evolution of Europe's varied landscapes, indicating the points of greatest pressure and change today and what might be done to see that these changes are rather for the better than for the worse.

EUROPE'S CHANGING LANDSCAPES

Yes, landscape is changing, and will undergo tremendous changes in the near future. How it will change, depends essentially on man, and to control the transformation of our environment should be one of our leading preoccupations.

Many different elements influence human life and landscape: it is easy to forecast, for example, how deeply the highly developed and developing areas of Europe will be altered by the revolution in agricultural policies, and the improvement in standards of living with shorter working hours leading to increased leisure. The Mansholt Plan predicts the end of small-scale agriculture, and, as a result, a complete remodeling of the current agricultural system. In the process, more land will become available for leisure, as increasing attention is being given everywhere to this social and economic phenomenon. Such development will call for a complete restructuring of the landscape, based on ecology, in an attempt to restore, as well as possible, the natural balance between man and his environment previously maintained to a large extent by small farmers.

Quoting Mr Batisse, head of UNESCO's Division of Natural Resources in the UNESCO Courier: 'Until a few decades ago, the triumphant progress of a technological civilisation, based on scientific knowledge, seemed to confirm man's total victory. Then, all at once, danger signals were observed.

In a brief period, man has so effectively conquered nature, that he is now in the process of destroying it. Perhaps we should restore the original natural balance, by giving up some of our conquests, or at least set up limitations for them.'

What we actually aim at is welfare and leisure. Welfare means industry, which is constantly expanding through scientific and technological development, offering unprecedented opportunities to improve (or worsen) man's standard of living, but which needs more land, more space, more natural resources every day.

Increasing leisure and recreation, and a higher income for all, lead to massive migrations at holiday time, promoting tourism and related industries. All these developments will inevitably have their effect on the landscape. It means more highways, more airports, more temporary accommodation. But unique landscapes of mountains, islands, lakes and beaches may be spoilt by a thriving but uncontrolled tourist industry.

These developments may destroy forever — and have already destroyed in many well-known cases — not only the beauty of the landscape but often also the natural resources themselves; polluting air and water, ruining fertile land, and otherwise degrading the environment.

To preserve existing values, in the face of the unavoidable changes which will affect the landscape of Europe, it is urgent to make an inventory of the finest of our threatened landscapes and sites and organise them into a network of green corridors, covering Europe.

This could then be used as the basis for the essential masterplan, guiding the various countries towards a co-ordinated green space policy.

International cooperation is obviously needed to achieve such an objective, not only in a political and economic sense, as the indispensable link between the various countries that are building tomorrow's united Europe, but also on a wider scale, as the link between responsible citizens of a world that man can ruin or inhabit creatively. It calls for team work among specialists of all the professions related to the conservation and rational use of the resources of the biosphere. They must promote further research and a wide exchange of information, to discover and enforce the measures needed to solve the many and urgent problems of land use.

The acceleration of scientific progress in all fields should permit man to fulfil his hopes for a better physical and mental life. If such progress is adequately controlled and coordinated, the deterioration of the human environment can be avoided but such coordinated control depends essentially on increased cooperation between all countries concerned.

FG BREMAN

Secretary General of the International Federation of Landscape Architects

COASTAL conservation

I must confess that my travels have left me depressed. Many, many miles of Europe's coastline are now no longer in a natural condition. Tourism, especially in the Mediterranean, has made an enormous change in the last fifteen years. Hotels, flats, chalets, caravan parks and even shacks are increasing rapidly, and all too often there appears to be no plan to govern the distribution of new buildings. There are often no gaps, and certainly, no open areas of any size, within long stretches of built-up coast. In Northern Europe the problem is the same but the response is very different. The north has realised the danger, and the Scandinavian countries, for example, have now taken stringent measures to protect those parts of their coasts which remain unspoilt. Each country must, of course, decide what it wishes to do with its own coast. There is no doubt that the number of tourists will continue to increase, especially in the Mediterranean. But will they be satisfied with a more or less continuous town along many miles of coast? To anyone who knew the coast between, for example, the Pyrenees and the Camargue in the late fifties, the changes that have taken place and are likely to take place in the next few years are immense. If the visitor is an 'Urbaniste' he will doubtless find much to interest him; if he is concerned with nature and the conservation of even relatively small parts of the coast in a natural condition he will be horrified. Unless strong measures are taken soon the natural beauty of much of the European coasts of the Mediterranean will be spoiled forever. It cannot be over emphasised that once a coastline is spoiled, it is almost impossible to recreate it in its natural state.

Only too often planning on the coast is in a very elementary stage. Local councils or municipalities may have the decision about what to do entirely in their own hands. This, in general, is most unsatisfactory, not only because it may, and does, happen that a council in a rural or poor area is only too willing to sacrifice its coast for financial reasons, but even more because neighbouring councils may have very unlike views as to the uses to which their strips of coast should be put. If planning is on a larger scale, a province or a region, better results may follow. Unfortunately, in many parts which are not owned by the State or by a large landowner who has his own views on conservation, especially on the Mediterranean, the only planning seems to be that which governs the style of a building, rather than its siting.

There is only one really effective way of dealing with the use of the coast — an overall state plan carried out by people who understand the economic, urban, tourist, agricultural, conservation and other demands on the coast. The plan must then be agreed and fully supported by the central government of the country concerned. This is not simply a course of excellence, it is one that is practical and can be begun in the most vital parts of the coast of a country and gradually extended. Some southern countries are still in a position to apply this widely, for example, Cyprus, much of southern Italy and Sicily, and Turkey.

Unless the central government backs such a plan, it is only too easy for wealthy organisations to put pressure on certain localities, obtain a stretch of coast, and develop it just as they wish and probably with no considera-

Professor JA STEERS

Extracts from a study of the protection of coastal areas in Europe: northeast Spain, southern France, northwest Italy and Ravenna, Cyprus, southwest Turkey, and parts of Holland, Western Germany, Denmark, Sweden and Norway.

tion of the parts of the coast on either side of it.

As a rule several government departments are concerned: of these transport, housing and urban development, tourism, defence, exploitation of mineral resources and agriculture are probably the most important. Their representatives should discuss together so that a concerted plan is obtained. Experience has shown only too clearly how one department acting individually can ruin a piece of country.

The ubiquitous motor car

I shall try to suggest ways in which the coast of any country may be treated so that as much as possible is made available to the tourist but in such a way that the natural features of the coast are conserved.

Because coasts vary so much in character it is not possible to apply the same regulations everywhere. The effectiveness of the regulation in some Scandinavian countries that buildings are not allowed within 100 metres of the beach depends upon the nature of the coast. Buildings on a bare rocky coast are, for example, conspicuous well beyond the 100 metre line.

In all countries the motor car is the greatest problem in coastal conservation. The parking of cars and the installation of restaurants and lavatories, which often use a considerable area, need careful planning.

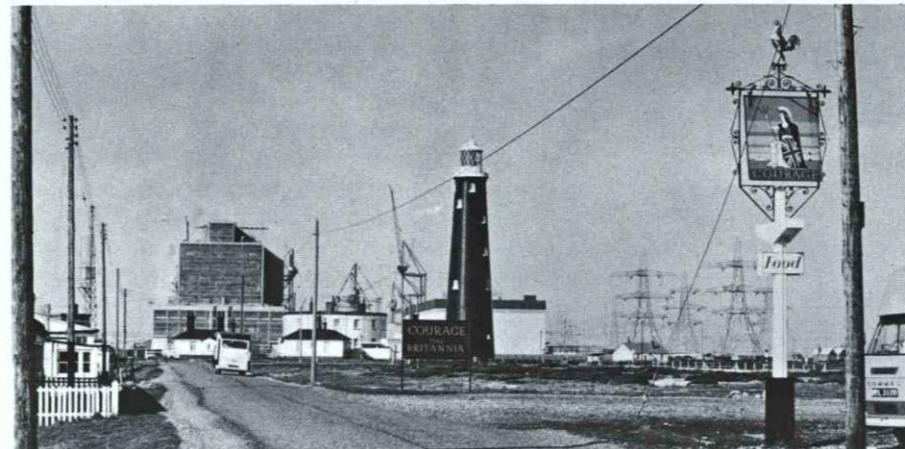
Of greater importance is the planning of new main roads along or near a coast. This, again, depends much on the local topography. A study of large-scale road maps of much of Italy and of eastern and southern Spain illustrates this very well. Roads follow



Brian Hawkes



Josip Ciganovic



Brian Hawkes

Europe's unique shingle spit, Dungeness (centre) and the famous sand dunes of the Coto Doñana (top) have been violated, respectively by nuclear power stations and tourist terraces. Top right: discordant development destroys character of Mediterranean village in Spain.



Josip Ciganovic

Above: Autostrada cuts the skyline behind an Italian coastal village.

coasts for many miles. Only too often advantage has been taken of this to develop existing towns and to build new hotels and flats all along the coast. In this way the whole appearance and natural beauty of the coast is upset and often ruined.

When new roads are to be built near the coast it is essential that transport, tourist and other organisations should discuss the problems involved. From a purely engineering point of view it may be argued that a new road should follow an easy way along the coast. If this happens it is almost certain that ribbon-development will follow it, or close to it. A slightly modified course for the new road may avoid this, and allow the tourists far better access to the beaches or coast by building small grouped settlements a little way from both road and coast. A better solution may be to build short spur roads from the trunk road to the coast.

The building of corniches, along cliffs calls for special consideration. They usually allow magnificent views of a coast, and they are likely to become increasingly popular. But are they also main roads for the normal traffic of the district? If so, serious difficulties may arise because, unless the road is sufficiently wide the tourist, sight-seeing traffic will impede the through traffic and vice-versa. Thus these roads need careful planning. In some places they may have to be one-way roads. They may also be toll roads as the tourist must be prepared to pay more for the new facilities he enjoys.

Where restaurant and other amenities are provided they must, as far as the topography allows, be built so they do not obtrude in the scenery.

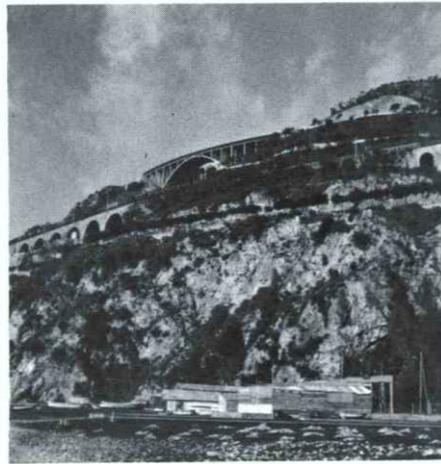
Over-use of a beach is a most important matter and one that is likely to become more so in the future. With increasing pressure upon the coast, some popular small places or beaches will be swamped. Some means must be developed to warn visitors in time to go to some other place if the beach they wish to visit is already fully occupied.

There is another aspect of the car problem. It is common in some places for cars to be used on the beaches, especially where these are broad and the sand hard. Sometimes it is essential for local people, fishermen and others, to take a car on to the beach for a justified purpose. Unfortunately, this proper use is apt to encourage others to use the beach as a highway. This is regrettable and in nearly every case indefensible. It is dangerous to children and others using the beach; it is unsightly and unnecessary. It should be prohibited except for special reasons, and these should be obvious to all users of the beach.

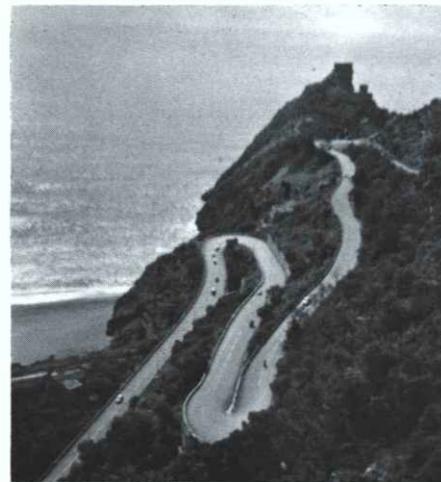
Coastal zoning and access

A length of coast may contain parts devoted primarily to recreation, whilst other parts, often adjacent to agricultural or forest areas, are conserved for some reason. It is essential to have careful access agreements with the agricultural interests involved. To prohibit access to a beach or beaches when the adjacent land is used for farming may well create difficulties and lead to trespass and damage which could have been avoided. As far as possible all beaches should be accessible to the public.

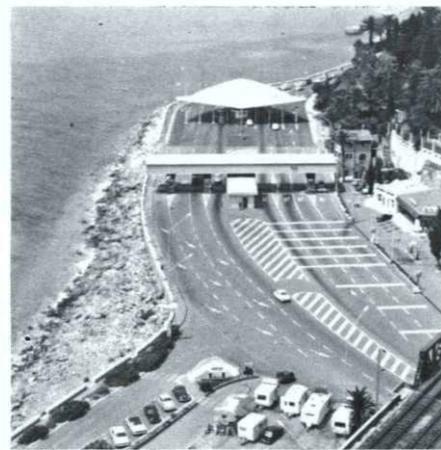
Cliffs and cliff paths present a more difficult problem. In some countries it is impossible, without trespass, to walk along the edge of the cliffs. Yet it is from such walks that the tourist, and the scientist, may derive great pleasure and information. Wherever possible, it is more than worthwhile for both national and local authorities to develop and maintain these paths. In recent years there has been a widespread development of marinas for sailing and power boats. These, it must be strongly emphasised, do not only affect the coast, but also the road and transport system leading to it. There are examples where a fine natural inlet, perhaps of ornithological or other scientific interest, is thought to



Motorway, railway, and old coast road married into the landscape.



Another motorway and its toll-gate stands out as an alien feature on the coastline.



Coastal corniche an attraction for tourist traffic which, without proper planning, may hinder through traffic.

be admirably suited for a marina. Within reason these two very different uses are not incompatible. If the use of the water is for sailing boats only little damage to natural history interests may arise, especially if certain key areas can be set aside as nature reserves, but if power boats are introduced, then there may be a serious impact on bird life. Once again the value of a national coastal plan is emphasised; there must be marinas, there must also be quiet undisturbed inlets; only a consideration of the whole coast will best show where each of these can be.

The increasing use of beaches and their immediate hinterland calls attention to the fact that some environments close to the sea are especially easily damaged. This is perhaps most apparent in sand dunes. The vegetation on dunes seldom forms a close cover and it is all too easily disturbed by people walking on the dunes. Once sand is exposed it is liable to blow, and a small bare patch can soon be enlarged into a major blow-out. The parking of cars in dune areas, a not uncommon practice, is one that should emphatically be prohibited. Several northern countries are careful to put down wooden planks or some other means to enable people to walk through dunes without disturbing them.

Noise from powerboats and the playing of musical instruments can often be a nuisance to the general community on a beach. On the other hand there may well be open-air concerts and other forms of amusement. Customs will vary from place to place, but in general the more remote the area, the more easily can its attractiveness be spoiled or destroyed by noise.

The needs of industry

The coast is not only for the tourist, but also for industry and urban development. Industry will make increasing demands on the coast, and the demands will in most cases have to be met. This is one of the major fields in which far-sighted planning is essential. Ports and port facilities are often interesting features in themselves and may add much to the attraction of a coast. On the other hand many of the buildings, warehouses and factories which are associated with ports may be serious eyesores.



Crammed in serried ranks right down to the sand (above) caravans spoil not only the view but also much of the pleasure of those who seek to relax by the sea. But caravans in curves, sheltered behind shrubs and set back from the beach leave the coastline unspoiled (below).



To take a small example from England: the electricity sub-station at Shoreham in Sussex is a catastrophe! In short, when new port development takes place, it is advantageous that discussions should take place between all interested authorities, and that the matter should not be left in the hands of only one authority.

A particular problem at the present time is the siting of oil installations, refineries, and storage tanks, especially in relation to the huge bulk of modern tankers. An example is the curious association of an ancient city, extensive chalet and camping development and a major oil refinery at Ravenna. In Wales the great storage tanks of three major oil companies at Milford Haven have been reasonably camouflaged, but nevertheless are exotic elements in a rural landscape. Attention must be given to those parts of a coastline which are of especial beauty or scientific interest. If a survey is made of the coast of almost any country certain parts will fall under one or other of these headings. A coast of outstanding beauty need not run far back from the sea, perhaps only a kilometre, or even less. But in it great care should be taken to see that any new building or other change made does not in any way spoil it. These areas should be made accessible to visitors. Every care should be taken to see that litter is not left about and that no damage is done. Coasts of especial scientific interest will be known to naturalists and their limits need careful demarcation in the field. It may well be that special rules of access will apply to them. Certain parts of such an area may very properly have to be put 'out of bounds'. But it is usually well to take the public into confidence as much as possible. The more the ordinary man or woman knows about the reason for setting aside a reserve for scientific reasons, the more likely is he to respect the area and help in its preservation.

Involving the public

Indiscriminate scrambling up and down soft and sloping cliffs (which may lead to more rapid erosion) climbing to the top of an ancient archway which is clearly in a partially ruined condition, picking of wild flowers which may be rare or peculiar to a

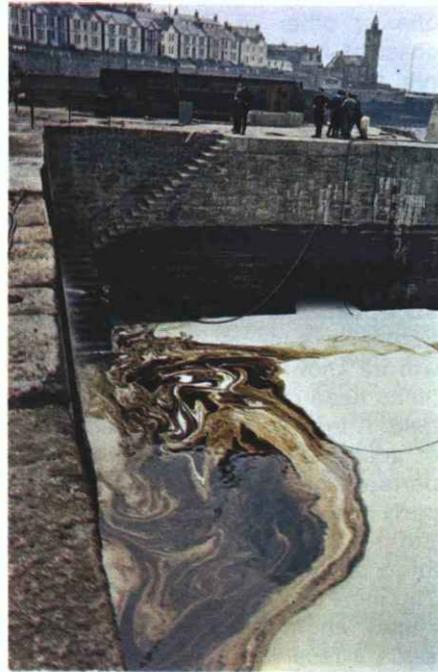
continued on page 16 →



Bel-Vienne / Jacana



Bel-Vienne / Jacana



GW Potts



DP Wilson

CALL TO STOP SEA POLLUTION

Commander Cousteau, the French deepsea explorer, addressed a meeting of several Committees of the Consultative Assembly last autumn which concluded by producing the Declaration reproduced below. Similar appeals were made at the 2nd International WWF Congress in London at the instigation of Swiss oceanographer Jacques Piccard and Norwegian navigator Thor Hyerdhal.

'Having heard the alarming statement of Commander Cousteau on the degree of pollution of the sea which threatens directly the very life of the sea and, consequently, puts in question the survival of humanity as a whole;

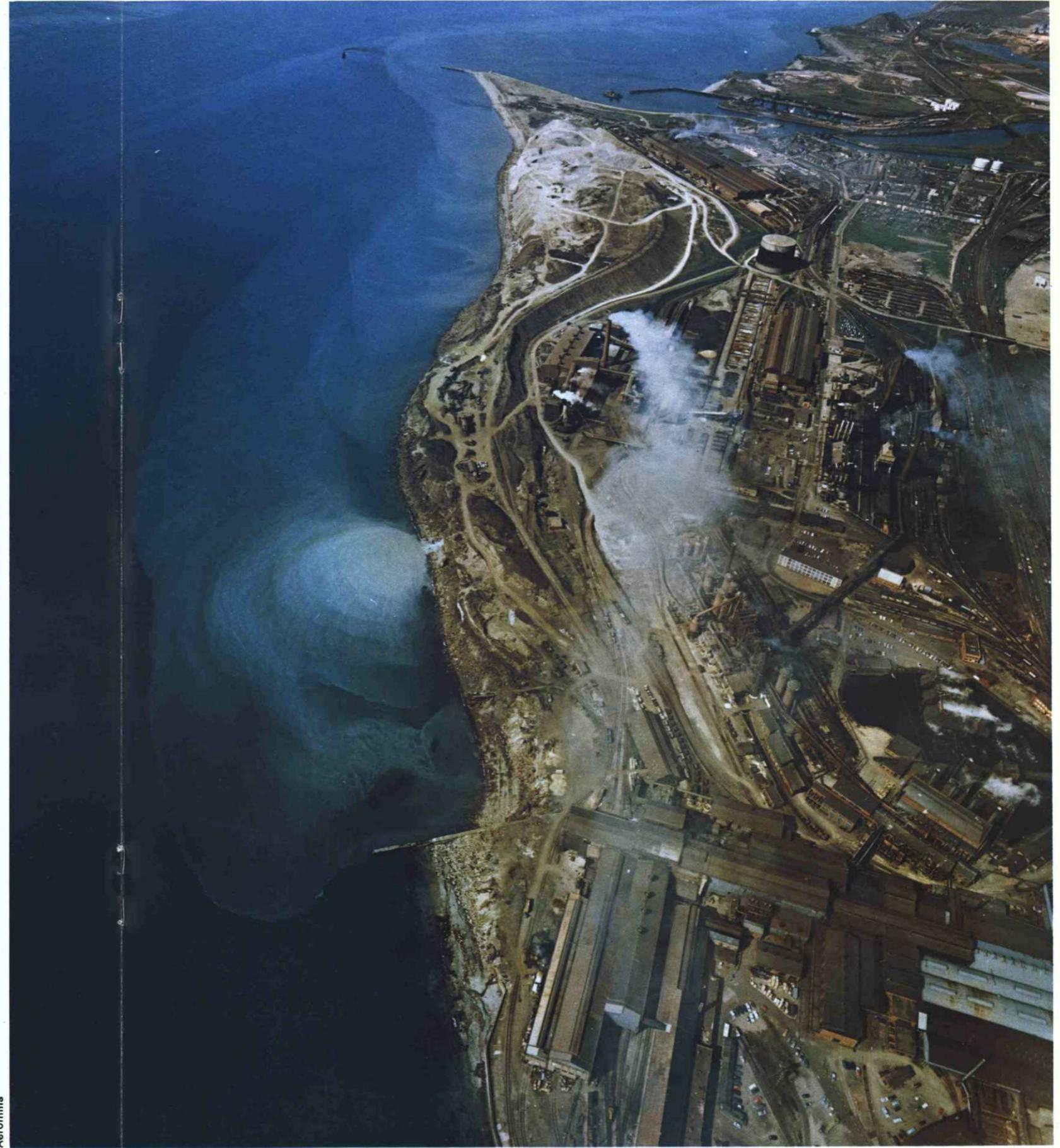
Recalling the action and projects of various maritime States which contribute directly to an increase in sea pollution or constitute new threats;

Aware, however, that sea pollution is only the final consequence of pollutions of all kinds affecting the planet;

Recalling the European Water Charter in which it is stated that water is a common heritage;

Appeals urgently to member governments to take forthwith the drastic measures called for, on both the unilateral plane and by international cooperation, to put an end to a development some of whose effects are already irreparable and disastrous for mankind.'

Aerofilms

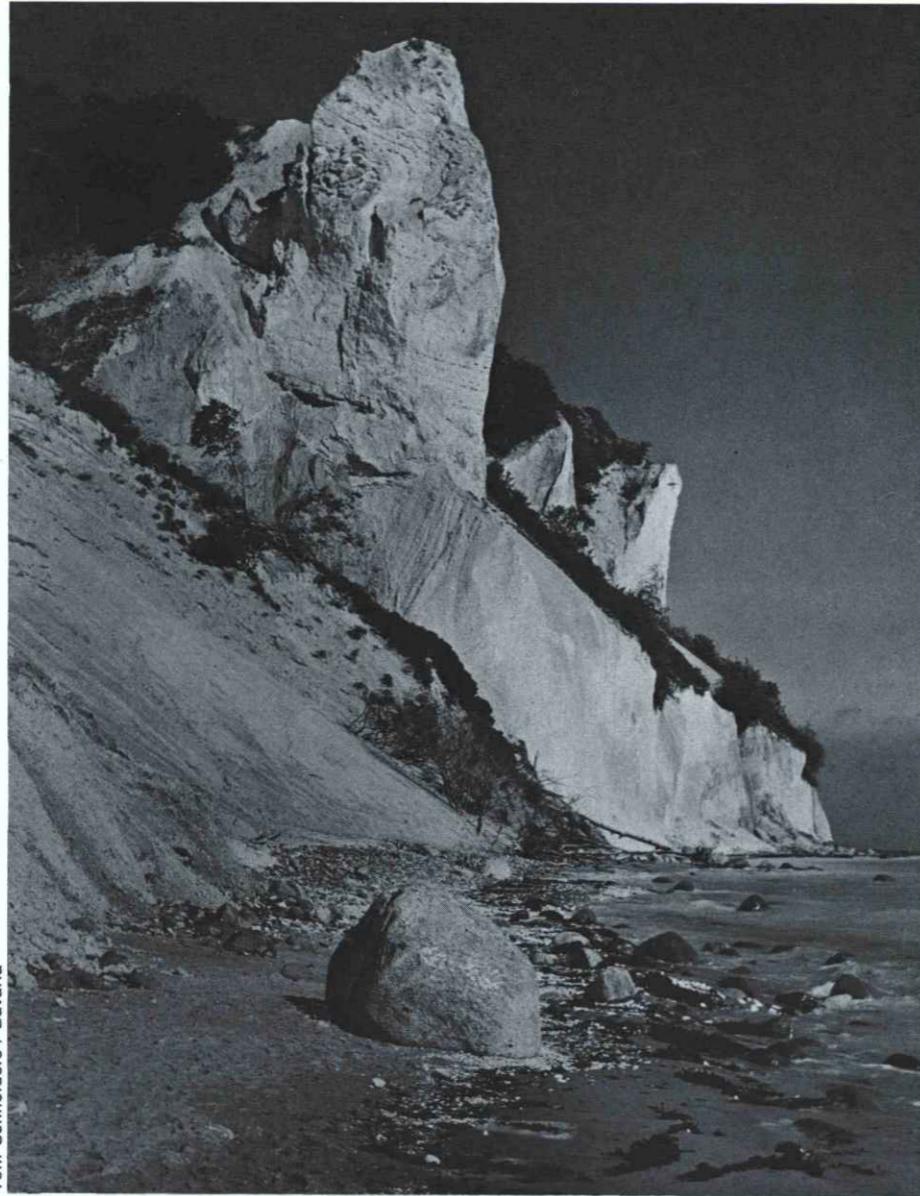


locality, are all reprehensible. People who would not dream of hurting or killing a bird are often ruthless, because uninstructed, in the damage they do in other ways.

It may help in some places to have a hut or small building where information of a general and scientific nature about the coast is obtainable. In such a building it may also be possible to have a small display showing the flora and fauna associated with the area. These displays are often of particular interest if they are adjacent to seaside 'villages' of huts and chalets. Nature trails may be laid out with advantage, for both walkers and motorists. Specially prepared maps or leaflets describing the interest of a stretch of coast are helpful.

There is scope in all countries for much more to be done privately or by societies or groups of people interested in the countryside either for scientific or amenity reasons. The National Trust in Britain is well known and has an enormous influence for good on the coast. In Italy a National Trust is being set up under *Italia Nostra* with headquarters in Rome. It is greatly to be hoped that similar bodies will arise elsewhere.

It cannot be too strongly stated that coastal scenery is a valuable resource not merely as an amenity but also economically to any country. There is no need to call attention to the commercial value of the Mediterranean beaches! But there is need to add that the coast should be available and attractive for all users. A national plan for the use of a country's coast is more and more essential. Until such a plan is made it is far too simple for an authority, local or national, to give permission for this or that part to be 'developed' without any reference to the adjacent coasts. Those countries which still have many miles of unspoiled coast should take action at once. The 'developer' with his money and schemes can swoop in suddenly and devastatingly unless a national plan is prepared to prevent such action. Development must take place in the modern world, and more and more of it will be on or near the coast. To meet this requirement and at the same time to make the best use of the coast it is important to have competent national plans which will be supported effectively by the central government.



Toni Schneiders / Bavaria

A last bastion?

The few remaining stretches of unspoiled coast in Europe need immediate and drastic protection. Only firm national plans, developed on a European-wide basis and implemented by government-supported local authorities, can save what remains of our precious heritage.



Nils Nilsson / Tiofoto

Wetlands — fens, marshes and shallow waters — are amongst the most difficult of natural landscapes for the ordinary man to appreciate and value. Indeed the popular view is one of hostility and even fear, instilled by centuries of myth and half-truth. Most people still think of wetlands as areas to be 'reclaimed', wastelands like deserts. This view ignores the fact that, in most cases, wetlands have not been lost to man in the first instance, but form an integral part of the natural water regime.

The initial interference with such a regime may be quite easy but inevitably leads to a continuing series of consequent measures. The boggy areas in the upper reaches of a river system may be drained to provide summer pasturage. But they can then no longer act as regulators, absorbing excess water during periods of high rainfall and snowmelt and releasing it slowly during dry seasons.

Flash floods therefore occur downstream and more and more of the river has to be embanked and straightened to control them. Eventually a rapid run-off may be achieved but the fertilising silt is not deposited along the river's course, being rushed out to sea. This is accentuated, and actual erosion is caused, when lowland drainage is accompanied by deforestation and the opening out of fields by the removal of hedgerows.

During dry periods, in contrast, there is insufficient water for agriculture and the rivers become excessively contaminated with domestic and industrial filth. To correct some of these ills the water may be held back in reservoirs behind dams across the river's course. But then, as in the case of Egypt's High Dam, the fertilising silt sinks out uselessly in the reservoir basin. To keep the downstream land in good heart, expensive factories to produce fertilisers have to be built and operated. This will not help the off-shore fisheries, dependent on the rich productivity of coastal marshes built up from the silt carried down to them. Artificial fishpond farming is not a very satisfactory substitute. In wide, flat plains the construction of dams may be too expensive in terms of land-inundation. Recourse can then be made to bore-holes and artesian wells to produce the needed water supplement. Yet already in many areas

wetlands
in the natural landscape



A new dam cutting off the Lauwerszee from the Waddensee (the incomparably rich haven for wildlife with its famous reserves such as the Boschplaat — see *Nature in Focus* autumn 1970 p 13).

The IJsselmeer dam, part of 'The engineer's dream of a tidy arc of concrete from Jutland to Belgium'.



A Tessore / Unesco

these reserves are being depleted, the surface water having neither the time nor the pressure to percolate to the water-holding strata.

The menace of the tidy mind

Eventually man's ingenuity may produce a compromise: a wholly artificial water regime, after the expenditure of much money and labour. The highly skilled technicians must then turn their energies and their machinery to more and more marginal aspects of the wetland environment, to keep themselves employed. This is one of the dangers of technological civilisation, based on the belief that all change is improvement even if it is only keeping people busy. This is the threat that looms over the Dutch, German and Danish areas of the Waddensee. The engineers dream of a tidy arc of concrete from Jutland to Belgium.

The rate of loss of natural wetlands is alarmingly high, but fortunately some of the economic absurdities of drainage and interference are being increasingly realised. Thus the stubborn, astronomically expensive, yet unsuccessful attempts over 150 years to drain Hornborgasjön in Sweden have at last been abandoned. Measures are now in hand to restore the great lake to its proper place in the wetland system. Important, too, is the growing realisation that wetlands are valuable for research, education and recreation. Sailing, shooting and fishing are all wetland-based sports capable of giving an economic return as well as meeting the growing demands for leisure occupation. So too is bird-watching, either in the strictly ornithological sense or in the wider, unscientific, indeed untutored, appreciation of the wetland birds.

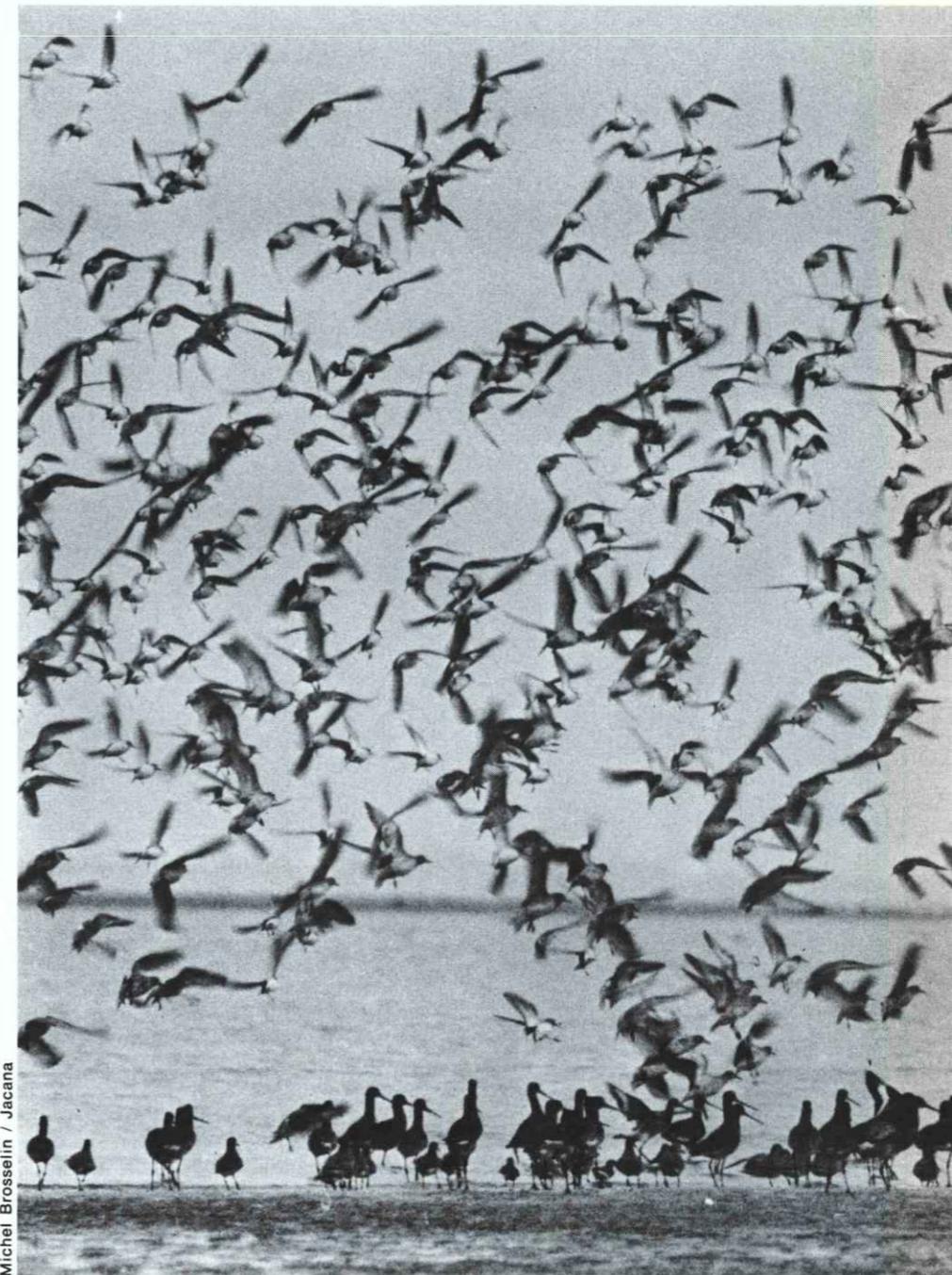
Waterfowl, beautiful and mass-flying, lend wetlands their special character and surely are their major glory. They serve both as indicators of the area's biological richness and as the source of public interest without which no conservation programme can flourish. Swans and waders, ducks and divers, flamingos and rails, cranes and geese, inspire the poet and the painter and evoke for all men the spirit of the wilderness — so needful if we are to retain a proper sense of our own littleness.

Good progress is being made towards a Convention between governments to conserve at least those wetlands which are of international importance on account of their waterfowl populations (see p 22). But even when this comes about there will still be need at national level to safeguard the less important wetlands. The constant whittling away of these areas will be just as serious in the long run. In Europe, wetlands, especially the coastal and estuarine marshes, are becoming so scarce that further losses cannot be viewed with any equanimity.

Fortunately the scales are not tipped only one way. New wetland areas are being created in the wake of industrial developments. Gravel pits and reservoirs and coastal impoundments afford resting places for waterfowl, though sometimes they are too deep and barren to provide feeding grounds as well. Not unnaturally there is keen competition among wetland recreational activities to obtain the use of these new areas. Some of these activities are incompatible with waterfowl usage, but, given goodwill it has been possible in many cases to work out satisfactory compromises. A large wetland may be zoned between the various activities or a group of smaller wetlands may be allocated on a regional basis, one to each activity. Sometimes a seasonal division is possible, sailing in summer and a waterfowl refuge in winter.

Playing at God

Some of the most productive wetlands are completely artificial in origin. Thus in England the Norfolk Broads are flooded peat diggings, and few places hold more wintering waterfowl than the Ouse Washes, a narrow flood plain between parallel rivers cut to drain the primeval fens. Moreover it will be necessary to increase waterfowl usage of the remaining wetlands by artificial means. Not only must reserves and refuges be set aside but they must be actively managed to keep them in prime condition. The natural evolution from water to marsh to dry land has to be halted and held at different stages according to planned requirements. Not only must the killing of waterfowl be restricted in a rational manner, but the breeding of replacements must be encouraged.



Michel Brosselin / Jacana

A small part of a flock of thousands of waders, an indicator of the tremendous richness of the mudflats which are being inexorably swallowed up by an advancing tide of concrete.



Aerofilms

So, just as the water engineers have enmeshed themselves in a never-ending round of manipulation, the biologists face continual involvement and expenditure. Playing at God is a full-time occupation. Hopefully the lessons learnt in over-developed Europe can be applied fruitfully in other parts of the world. There should be a policy of non-interference over wide tracts of the great arctic and tropical wetlands that have not yet fallen to the advance of technology. Time is short.

Rich silt deposits in Fosdyke Wash with reclaimed farmland on either side. The natural flow of rivers in this area has deposited sediment to the extent of some 28 500 hectares since Roman times; fertile soil which, with today's 'engineering', would mostly be washed out to sea.

GVT MATTHEWS

International Wildfowl Research Bureau
Slimbridge, Gloucestershire, UK

...NEWS...NEWS...NEWS...NEWS...NEWS... **FROM STRASBOURG**

CAR EXHAUST POLLUTION — SWEDEN LEADS THE WAY

Following its meeting in January this year the Consultative Assembly is studying the possibility of asking all Council of Europe member States to adopt the standards and legislative provisions recently laid down by Sweden in regard to the reduction of pollution from motor vehicle exhaust fumes.

The Swedish authorities have issued regulations which stipulate: closed crankcase ventilation from model year 1969, stricter limits for diesel smoke from 1 July 1969, new limits for petrol vehicle exhaust emissions from model year 1971, lowered limit for lead in petrol from 1 January 1970. A limit for carbon monoxide for in-service vehicles with the engine idling has also been proposed.

A FUTURE FOR YOUNG FARMERS

The problems of general education and vocational training in country areas are to be given increased emphasis in the work of the Consultative Assembly's Committee on Agriculture. This Committee, which is currently elaborating a European Agricultural Charter, realises that rural and agricultural youth has a particularly important part to play in the campaign for nature conservation and the protection of the human environment. The profound changes occurring in society and the present day difficulties of European agriculture demand increasing mobility and adaptability on the part of young farmers and rural youth and these young people can find their place in industrial society only thanks to a sound general education and vocational training. The Agriculture Committee established a firm basis for its work in this field by inviting representatives of European

young farmers' and rural youth organisations to its meeting in Paris on 27 April when a lively and useful exchange of views took place. The Committee has asked the Assembly to support this work because it is in the interests of every State to be able to rely on a rural and agricultural population capable of undertaking new tasks vital for the future of mankind.

EUROPE'S ROLE IN OCEAN SPACE

A European institute for ocean studies and a European Ocean Space Commission were proposed at a Symposium on the exploitation of the seabed in Strasbourg, 3-5 December 1970, organised by the Consultative Assembly of the Council of Europe. These would coordinate and harmonise the actions of European States in ocean space, and promote education in marine science and technology.

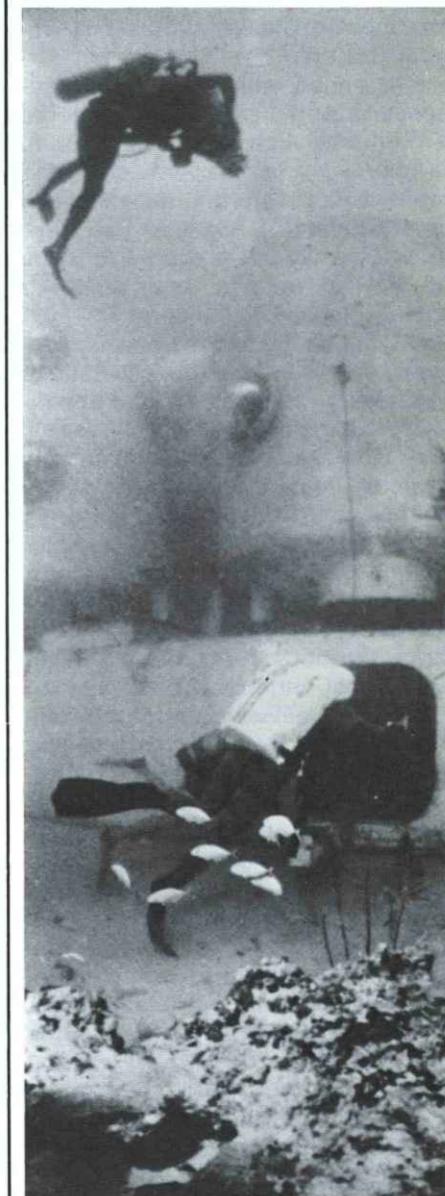
During the symposium some 100 parliamentarians from 15 of the Council of Europe's member States learned from technical and legal experts much about the problems posed by the prospect of a more intense exploitation of the mineral resources of the sea-bed beyond the present limits of national jurisdiction. The questions of gaps in the law governing pollution, the conservation of living resources and the reconciliation of the different uses of the ocean spaces naturally gave rise to serious anxiety.

It was felt that the future of the seabed and the position of the European States in this field depends not only on their successes or failures in science and technology, but also on the weight which they can have in the formulation of legal rules and regimes applicable to sea-bed exploration and exploitation.

The proposal to set up a European institute for ocean studies and a European Ocean Space Commission, if

adequately supported by member States and backed up by an informed public opinion, could ensure a peaceful and prosperous future for Europe in this field.

Explorers regain their submarine laboratory.



USIS

SHORT NOTES

TOWARD A WETLAND CONVENTION

A remarkable political precedent was set by Iran when, at an International Conference on the Conservation of Wetlands and Waterfowl, Ramsar, 30 January to 3 February 1971, she offered to forgo part of her sovereignty for the good of the international community.

The opening message from His Imperial Majesty the Shahanshah Ar-yamehr ended with this startling announcement: 'To emphasise the depth of our convictions that our natural environment must be protected and that all nations are interdependent in the attainment of this goal, we wish to state that Iran is prepared to place one of her wetland ecosystems of special global significance in joint trust with a suitable international agency, such as the United Nations Organisation, to conserve and administer for all mankind.'

This conference, the culmination of a series of international meetings during the past decade, was convened by the Government of Iran in association with the International Wildfowl Research Bureau. Eighteen governments sent official delegates and five others sent observers, as did eight international organisations.

An important achievement of the Conference was agreement on a final text of a Convention on wetlands of international importance, especially as waterfowl habitat, which has been in preparation since 1965.

The Conference also considered criteria for assessing the international importance of wetlands, reviewed the wetland situation in different countries, and discussed wetland management in semi-arid areas. Specific recommendations concerning wetland conservation were made to Denmark, the Netherlands and West Germany, to Iceland; to Ireland, to Afghanistan and the United Kingdom. A start was

also made towards the evolution of a convention on waterfowl hunting to cover the whole palaeartic region. *The full proceedings may be had from the IWRB, Slimbridge, Glos., GB.*

ECONOMIC BOOM = ENVIRONMENTAL CRASH

According to an official Japanese Information Bulletin various environmental hazards have assumed serious proportions, parallel with the rapid growth of Japan's national economy.

○ Air pollution

A main air polluting substance in Japan, which relies upon heavy oil to meet most of its energy needs, is sulphuric oxide. Air pollution due to carbon monoxide in traffic exhaust fumes is worsening on account of a sharp increase in the number of motor vehicles.

○ Water pollution

is ascribable to the inflow of waste water from various factories and mines as well as sewage. The pollution of rivers, lakes and ports has come to assume serious proportions due to intensified industrial activities and the concentration of population in urban areas.

○ Noise and subsidence

Noise, caused by factories, construction work, road traffic and aircraft, not only annoys local residents, but also interrupts their sleep, lessens their work efficiency and causes other troubles. Meanwhile, serious subsidence is caused by pumping up underground water in large quantities, mainly in areas crowded with factories.

○ New standards and controls

To combat these problems the government is rapidly increasing its expenditure on preventing environmental destruction. The £65 million spent in 1969 was 22% up on the previous year.

Environmental standards for water pollution have been set up and the government intends to determine similar standards for drifting dust and noise.

Basic principles for planning the prevention of environmental hazards have been established.

Clean air zones are being established, controls on sulphuric oxide emission have been strengthened and the monitoring system improved.

These measures, with the installation of heavy oil desulphurising equipment, have begun to reduce pollution. The control of waste water discharge has been strengthened and the rate of improvement of the sewerage system is being accelerated.

Night flights have been banned at Tokyo airport and the runways are being extended so flight landing and take-off paths will be over the sea.

○ Research

Principal research projects include: the effects of air pollution on human health, computerised forecasting of pollution, the effects of various types of environmental contamination on crops, the elimination of noxious substances discharged by motor vehicles, methods for controlling noise, for the disposal of waste plastic goods, and for desulphurising heavy oil.

The government has concluded that the settlement of the environmental hazards problem is one of the prime tasks confronting Japan in the 1970's in order that the benefits of a steadily growing economy can be effectively directed towards the realisation of a society in which man may lead a full and rewarding existence.

OILED SEABIRDS COUNT

On the last week-end in February every year birdwatchers in northwest Europe count the number of dead birds on their beaches to assess winter mortality and the effects of oil pollution. The Seabird Group, a body of experts which analyses the results, reports from Britain that nearly 500 miles of beach in all parts of the country were examined in 1969, and twice as much in 1970, when regrettably the density of dead birds was also found to have doubled, from an average of 1.8 to 3.3 bodies per mile. About two-thirds were affected by oil pollution in both years. The pattern of mortality has been much the same in both years, with most bodies where many northern birds spend the win-

ter, off large ports along the northeast coast, although there are local trouble-spots in the southwest and the Firth of Clyde in southwest Scotland, presumably due to pollution from shipping using the trade-routes extending out into the Atlantic.

The auks, especially the guillemot, are most seriously affected, followed by ducks and gulls, with individuals of a wide variety of species, some of them rare. It was calculated that at least 3000 bodies must have been present on British beaches alone in late February 1969, and the situation was reported to be very much worse on the east side of the North Sea, although the figures for the European mainland have not yet been published. Some of the oil pollution may have come from collisions and wrecks, though none were reported at the time of these particular surveys. Most of it probably came from oil tankers and oil-burning ships cleaning their tanks. It is also notable that oil was first found in the course of drilling operations off the northeast coast, where the pollution was worst, at the time of these surveys. The results for 1971 are awaited with growing anxiety.

*WRP Bourne, Seabird Group,
Zoo. Dep., University of Aberdeen*

PROTECTING THE LAST WHITE-TAILED EAGLES IN WEST GERMANY

The white-tailed eagle or sea eagle, *Haliaeetus albicilla*, is one of the most threatened of the large European birds of prey. Its population is rapidly declining and in West Germany only four or five nesting pairs remain, all in Schleswig-Holstein. To protect them from disturbance and even from egg-collectors the European Association for Free Nature Reserves (EUREL) has arranged for special reserves to be set aside by local landowners and a guard system, financed by WWF National Appeals in the United States, Germany and the Netherlands was instituted in 1969.

Although four eyries were occupied in 1970 and permanently guarded by Dutch volunteers, only one young eagle lived to fly. This was the one whose parents had been fed throughout the winter with pesticide-free offal from slaughter houses. The unhatched eggs from the three other nests con-



tained dead embryos all with a high dosage of pesticides DDE and PCB as in 1969, no doubt from sea birds and fish eaten by the eagles. Auxiliary feeding must be continued on a wider scale with the approval of the landowners who have also been asked to refrain from forestry operations in the nesting areas during the breeding season. It is hoped eventually to place these white-tailed eagle reserves on an official basis.

LOCAL GOVERNMENT ATTACKS POLLUTERS IN JAPAN

An increasing number of local governments in different parts of Japan are now making efforts to curb air pollution and various public hazards by concluding 'Public Hazard Prevention' treaties with enterprises in their areas.

Backed by strong public opinion, a number of local governments have decided not to permit any companies to build new factories and plants unless they agree to observe all regulations for the prevention of public hazards.

An official of the Ministry of International Trade and Industry has said that all industries should be aware of the new trend and realise when they make plans to build new installations that they will be obliged to enter an agreement with respective local governments not to become public nuisances.

The electric power industry and heavy chemical industry are the most regulated among all the types of industry. Oil, paper and iron manufacturers come second.

STERILE MOTHS BEAT PESTICIDES

More than two million sterile codling moths, released throughout the summer in a 120 acre orchard on a Canadian research station, reduced injury to apples to less than 0.05 per cent. This was below the injury levels in most sprayed orchards in the district. The technique involved rearing sterile codling moths in a laboratory using gamma radiation, then releasing vast numbers of them in an infested orchard. Since the mating behaviour of sterile and fertile moths is the same,

Eric Hosking

the flood of sterile insects reduces the chances of fertile males and females mating to about nil. A fertile female mated by a sterile male produces eggs that are sterile and do not hatch. The sterile insects were distributed in the orchard in cardboard boxes dropped from a helicopter flying at 45 miles an hour. This procedure is too expensive for commercial control as it takes too long to prepare and load the boxes containing moths and there is room for only 100 boxes in the helicopter. Other experiments are developing cheaper release procedures.

SKY-DIVING MOTHS

Sterile pink bollworm moths are the latest members of the sky-diving fraternity, according to a report from the US Department of Agriculture.

The laboratory-reared moths, made sterile by gamma radiation, are being air dropped without any protection, from low-flying airplanes travelling at from 100 to 200 miles per hour. The moths withstand the freefall without injury. They then mate with native moths of the area and prevent them from reproducing.

Scientists of USDA's Agricultural Research Service who are conducting these experiments point out that the method saves costs of packaging and that more moths can be carried in each airplane.

OECD Agricultural Review 3 / 1970
See also book review p 27

THE WINGED ARISTOCRATS

'The Winged Aristocrats', the award winning ECY film featuring Europe's birds of prey, which was made by the Royal Society for the Protection of Birds, has already had a royal showing in Belgium. It is being shown throughout France (in a French sound track version) by the Ligue française pour la Protection des Oiseaux, in Holland (with Dutch subtitles) by the Dutch World Wildlife Fund — the Wereld Natuur Fonds, in Italy (with an Italian sound track) by the Anglo-Italian Society for the Protection of Animals. A distribution is also being planned in Spain and in Sweden.

Further information on this highly successful ECY film may be had from RSPB, The Lodge, Sandy, Bedfordshire, Great Britain.

THE WORLD WILDLIFE FUND IN NORWAY

At a recent press conference in Oslo it was announced that a National Appeal of the World Wildlife Fund has been started in Norway. This 'World Wildlife Fund i Norge' is the 15th member of the international organisation for the conservation of nature, founded in 1961, and based in Morges on the Lake of Geneva in Switzerland. Directed by banker Johan Melander and many other personalities of the Norwegian business world, the first objects of the new Appeal will be the preservation of endangered animal species in Norway. It will, however, also participate in the realisation of international projects of the World Wildlife Fund such as the Guadamar Nature Reserve in Spain.

225 000 POUNDS FOR THE WORLD WILDLIFE FUND

Thanks to a series of donations received mainly from sources in Great Britain, the World Wildlife Fund (WWF) has been able to create recently a special endowment fund with a capital of 225 000 pounds. Established to ensure a sound financial basis for the WWF's nature conservation work, this fund is named after Peter Scott, eminent British conservationist and founder and one of the Vice-Presidents of the WWF. During the next few years other special donations should bring the capital of the fund to 750 000 pounds, thereby guaranteeing the basic work and development of the WWF.

APPEAL TO PRESERVE THE HARP SEAL

The harp seal *Pagophilus groenlandicus* which breeds mainly off the coasts of Canada and Norway, has been declining in numbers in recent years due to constant over-exploitation by hunters. IUCN and WWF have appealed to the Ministers of Fisheries in Ottawa and in Oslo to reduce their quotas for sealing in the Gulf of St Lawrence and off the coast of Labrador. It has been pointed out that the harp seal, if cropped under proper control, could easily continue to be of great value to mankind. IUCN and WWF suggest that the numbers taken be brought into line with the sustainable yield, so ensuring the survival of the species.

EAGLE OWLS FROM ENGLAND TO SWEDEN

In common with many predators, the European eagle owl *Bubo bubo* has declined over much of its range since the last war. Many factors have contributed to this decline, among them the use of poisonous pesticides in agriculture, and destruction by man in a mistaken belief that this species conflicted with his interests. It is now well known that its staple food consists of rodents.

The Norfolk Wildlife Park which exhibits what is probably the largest collection of European mammals and birds under near-natural conditions, has always been successful in breeding owls and other birds of prey. Since 1960, 47 eagle owls have been bred in the Park and of those 18 have been presented to the Swedish conservation authorities at Skansen to help their project to re-establish this species in the wild in Sweden. Four young eagle owls have also been presented to the German conservation authorities who are responsible for a similar re-introduction scheme in the Eifel area of Germany.

The Swedish project has been in operation for more than 15 years and results have been most encouraging in that pairs of eagle owls are now known to breed regularly in areas from which the species had been absent for a number of years.

All young owls are dependent upon their parents for food a good many weeks after they have left the nest and for this reason it is useless to set free young owls which have been bred in captivity and which lack the necessary experience to hunt their own prey. To overcome this, the Swedish method is to build a large aviary in the part of the forest where they wish to re-establish the birds. A pair of young eagle owls is then maintained in the aviary until they settle down and breed. Once their young are fully fledged they are released through a trap door while their parents are still kept inside the aviary. Food is placed on the top of the cage and this, combined with the presence of their parents, prevents the young owls from straying too far. They return every night for their food while they are learning to adopt a completely wild existence, and only when they have discovered the art of catching their



A family of Tengmalm's owls (*Aegolius funereus*) which features in a brilliant moonlit sequence in the new RSPB film on Europe's birds of prey — 'The Winged Aristocrats'.



Eagle owl (*Bubo bubo*) once on the decline in its native Sweden and Germany, is now re-established thanks to a successful programme of breeding and reintroductions mainly from the Norfolk Wildlife Park in Britain.

own quarry do they cease to return for the food put out for them. Soon after this they occupy their own territories in the vicinity. It is imperative to ensure the complete cooperation of the local human population before such an introduction is attempted in any particular area.

Similar re-introductions have been carried out locally in England by the Norfolk Wildlife Park with both barn owls (*Tyto alba*) and little owls (*Athene noctua*) bred in the collection.

Philip Wayre, Director, Norfolk Wildlife Park, Great Witchingham, Norwich, Norfolk, England

EUROPE'S GOLDEN NIGHTINGALE

A Leach's petrel *Oceanodroma leucorhoa* recorded in the Westmann Islands in Iceland, won a Golden Nightingale Trophy for Mr Patrick Sellar of Great Britain. It was the first prize in the first international wildlife tape recording competition which was organised during European Conservation Year by the BBC Natural History Unit under the sponsorship of the European Broadcasting Union.

There were 237 entries in the four different classes from fourteen countries, including Hungary, Czechoslovakia, and East Germany.

Among the other unusual sounds entered were a badger *Meles meles* snoring underground, the bell-like tone of a midwife toad *Alytes obstetricans*, and the 'song' of a New Forest cicada *Cicadetta montana* which is so high-pitched that people over forty may not be able to hear it.

The first in each class received a Silver Nightingale trophy, the second a Bronze Nightingale trophy, and the third wildlife LPs including some donated by the Swedish Broadcasting Corporation.

Jan Lindblad / Photo Researchers

Eric Hosking

THE PRICE OF POLLUTION

Extract from an article by Professor Pavan — Director of the Institute for Entomology of the University of Pavia — in 'Corriere della Sera', Milan.

The damage caused by air pollution to man's health in Italy has been estimated to amount to 134 million dollars in 1966 and to have increased to 160 million dollars in 1968. Damage caused by air and water pollution to Italy's natural heritage in 1968 amounted to 75 million dollars. How this figure is distributed throughout the various sectors of the environment and the increase foreseen for 1985 can be seen from the table.

Present or threatened soil erosion over as much as 50 000 square kilometers, a sixth of Italian territory, causes 480 million dollars' worth of damage to Italian agriculture a year. Just recently 20 000 farmers in the Milanese Plain have asked the courts, through the Milanese Provincial Federation of Farmers, to take legal action over a loss of 24 million dollars yearly, caused by water pollution to agriculture.

In 1967, 84 million tons of oil were unloaded in Italian ports, as many as 250 thousand tons of which ended up in the sea.

While the State finances reforestation of 25 000 hectares a year at an expense of 14 400 000 dollars, fire sometimes premeditated, sometimes accidental, but not due to autocombustion, destroys as many as 40 000 hectares of forest every year: a continual net loss. To check erosion and floods fairly quickly by reconstituting the forestal balance in the 3 million hectares of land in need of reforestation, 160 million dollars a year would be required. This would take political decision and goodwill on the part of the State, with an overall consideration of the need to restore the country's ecological balance, as was done in Switzerland with the forestal law following the Landholt report as long ago as 1862. An outlay of 9 billion, and 600 million dollars for the next fifteen years is the estimated figure necessary to restore geo-hydrological balance throughout Italy, to ward off the floods which caused, for example, the damage done in November 1966.

According to ENI-ISVET, Italian cultural assets (archeological and monumental sites and objects, works of

Annual economic damage in various countries due to air pollution. Figures are in US Dollars. (Based on data from various sources, especially Italy's National Hydrocarbon Board and the Institute of Studies for Economic Development and Technical Progress 1970 — ENI-ISVET)

Country	Year of valuation and population	Total damage in dollars	Damage per person in dollars
United States	1963 185 781 000	\$ 5 500 000 000	\$ 29.60
Great Britain	1964 54 000 000	\$ 915 000 000	\$ 16.94
Sweden	1964 7 650 000	\$ 95 000 000	\$ 12.41
France	1964 49 000 000	\$ 560 000 000	\$ 11.42
Italy	1968 53 327 677	\$ 560 000 000	\$ 10.50

Damage caused by air and water pollution to Italy's natural environment in 1968 (ENI-ISVET)

Environment or its components	1968 Absolute value in dollars	1985 Absolute value in dollars
Coastal Waters	\$ 9 600 000	\$ 22 080 000
Inland Waters	\$ 30 400 000	\$ 67 200 000
Coppices	\$ 4 960 000	\$ 13 760 000
Urban Parks	\$ 6 560 000	\$ 17 120 000
Wildlife	\$ 24 000 000	\$ 33 600 000
Total	\$ 75 520 000	\$ 153 760 000

art, books and archives) have suffered 57 600 000 dollars' damage from air pollution alone. For 1970 the damage is estimated at 67 million dollars, reaching 214 to 253 million dollars in 1985. If proper measures are not taken, we shall witness the gradual extinction of one of Italy's most active and productive patrimonies. The damage done by pollution to sea and lake tourism and to fishing for pleasure was 99 million dollars in 1968, over 107 million dollars in 1970, and is bound to reach 192 million dollars by 1985. Comparative evaluations are being made between damage due to the irrational use of the natural heritage and the cost of stopping and repairing such damage. One estimate, which is certainly lower than the true figure,

shows that the direct or primary benefits accruing to Italy, if pollution were eliminated, would be 640 to 925 million dollars in 1970, 910 to 1355 in 1975, 1264 to 1891 in 1980, 1792 to 2584 million dollars in 1985, based on the value of the dollar in 1968. We must also take into account the benefits deriving from possible measures against erosion, floods, the destruction of birds useful to agriculture, the advantage for tourism, etc. These are subjects we must delve into deeply; it is the logical development of a debate which has already begun among naturalists, economists, law experts, technicians in the various fields concerned, about typically interdisciplinary problems which require a global solution.

NATURE IN FOCUS LOOKS AT BOOKS

THE ENVIRONMENTAL REVOLUTION

Max Nicholson, pp 366, Hodder & Stoughton, London.

Without a doubt this is the most significant book in its field to be published last year. Subtitled 'A guide for the new masters of the world' it shows, in some detail and with striking examples, how man has tried to play at God, how he has failed and how, with greater humility, he may yet have hope for the future.

It is a challenging book and Max Nicholson, with his many years of experience in 'the wildlife business' does not hesitate to criticise the policies and reactions of his contemporaries in both the official and private nature conservation organisations. But his criticisms, however incisive, are always constructive and will (one hopes) stimulate a positive reaction. Four visual themes, on man's impact, the natural environment, the emergence of landscape, and the world of conservation, are developed with a series of 70 carefully selected photographs. These excite the imagination, enliven the text and, in a subject often prone to hyperbole, prove the author's arguments. As well as these very useful illustrated summaries a mass of detail is packed into the three annexes: the vegetation cover of the earth, a chart of human impacts on the countryside, and a flow chart of conservation processes.

It is impossible to do justice to this book in such a short review; it has many more fascinating aspects than can be listed here. This is one of those rare books, written by an expert, which will appeal to and excite the layman and administrator to whom environmental conservation is but one of many conflicting interests.

ECOLOGY SUMMARISED

PRECIS D'ECOLOGIE
R DAJOZ
Editions Dunod, Paris 1970

Here we have at last, in a single volume, all the principles of ecology,

backed up by numerous examples taken mainly from the animal kingdom. The work is divided into three parts. In the first, the factors affecting relations between living things and their environments are set out. In the second, the author considers population dynamics with special emphasis on fluctuations under normal conditions and the many causes of these fluctuations. Finally, in the third part, there is a definition of biocenoses and ecosystems together with an explanation of their characteristics and evolution. This part concludes with a brief description of the main ecosystems of the world.

The book is plentifully provided with graphs, tables, maps and diagrams and will certainly be a most useful work for both teachers and students of the natural sciences.

It will also be valuable for all those who are directly or indirectly concerned with the problems of our biosphere.

INTEGRATED CONTROL IN ORCHARDS

The 190 pages of the proceedings of the 4th symposium of the International Biological Control Organisation (OILB) are in German, English or French, each paper having a summary in at least one of the other languages. The majority of papers are reviews of one kind or another, often with good bibliographies, making this a most useful account of the present position on integrated control in orchards.

Organisation internationale de lutte biologique contre les animaux et les plantes nuisibles, Avignon, France.

THE WATER ENCYCLOPEDIA

Editor: David Keith Todd
Water Information Center, Water Research Building, Manhasset Isle, Port Washington NY USA

Described as a compendium of useful information on water resources this book is a practical reference volume containing some 550 pages of worldwide water resources data, facts, and statistics. It includes climates, hydrology, surface and ground-water resources, water use and needs, and water quality. In addition, information on water resources agencies and constants and conversion factors are presented. A remarkable book!

WILD MAMMALS OF EUROPE

Claus König
Mammifères sauvage d'Europe
Hatier, Paris
Wildlebende Säugetiere Europas
Chr Belser Verlag, Stuttgart
Zoogdieren van Europa
Nederlandse vertaling Zomer & Keuning, Wageningen

Contains descriptions of more than 150 European mammals with concise details of distribution, habitat, way of life, reproduction, feeding and classification. The 140 colour photographs, on pages alternating with text, give the impression that this is a popular book solely for the general public. The expert naturalist need not, however, despise this popular appeal as the book is in fact a very useful pocket guide to the mammals of Europe, including as it does, a key to the identification of small mammals. The colour photos should serve a useful purpose in attracting the young naturalist toward the study of mammals, less popular than the more easily observed and identified birds.



ZUSAMMENFASSUNGEN

EIN WELTWEITER ÜBERBLICK ÜBER NATURSCHUTZ — S 2

Dr Gerardo Budowski (Generaldirektor) & Robert I Standish (Leiter der Informationsabteilung)
Internationale Vereinigung für die Erhaltung der Natur und der natürlichen Hilfsquellen.

Im Bereich des Umweltschutzes wurden im letzten Jahr nicht nur in Europa, sondern in der gesamten Welt grosse Fortschritte erzielt. Die Öffentlichkeit vieler Länder ist sich jetzt dieses Problems bewusst. Mehrere internationale Organisationen befassen sich mit Umweltfragen. Beispielsweise hat UNESCO ein langfristiges wissenschaftliches Programm im Hinblick auf den Menschen und die Biosphäre aufgestellt; der UN-Wirtschaftsausschuss für Europa befasst sich mit den Zusammenhängen zwischen Industrie, Entwicklung und Umwelt; die Vereinten Nationen bereiten eine Weltkonferenz über Umweltfragen des Menschen vor, die vom 5.-19. Juni 1972 in Stockholm stattfinden soll; die Weltbank wird bei der Vergabe künftiger Darlehen eine Beurteilung der Entwicklungsvorhaben unter ökologischen Gesichtspunkten vornehmen; ausserhalb der Arbeiten auf Regierungsebene hat sich das erfolgreiche «International Biological Programme» in den Spezialausschuss für Umweltfragen entwickelt und die «Friends of the Earth» dehnen ihre Tätigkeit von den U.S.A. nach Europa aus.

Es werden Beispiele erwähnt, wie jeder Einzelne seinen Beitrag zur Erhaltung der Umwelt leisten kann, besonders durch Begrenzung der Familiengrösse und durch Bildung von Aktionsgemeinschaften.

Es werden einige Beispiele von jüngsten gesetzgeberischen oder administrativen Fortschritten angeführt: um Verunreinigungen zu verhindern, wurden in den meisten Industrienationen entsprechende Schritte in die Wege geleitet; viele Staaten haben die Verwendung von giftigen und sich nicht abbauenden Pestiziden verboten; viele neue Nationalparks oder Naturschutzgebiete sind geschaffen worden oder werden geplant; Ödland wird urbar gemacht (besonders in Deutschland, Grossbritannien und den Vereinigten Staaten); der Pelzhandel wird sowohl auf freiwilliger Basis als auch durch die Gesetzgebung überwacht.

Die grösste Hoffnung für die Zukunft ist jedoch, dass anerkannt wird, dass kein Land allein und völlig selbständig über seine Hilfsquellen, wie es etwa Luft und Wasser darstellen, verfügen kann.

GEMEINDEN UND NATURSCHUTZ — S 6

Dr Walter Münch, Berichterstatter über Raumordnung und Regionalfragen der Europäischen Gemeindekonferenz

Die Arbeiten der Europäischen Gemeindekonferenz, des zwischenstaatlichen Ausschusses für Zusammenarbeit in Kommunal- und Regionalfragen und der 1970 in Bonn stattgefundenen europäischen Raumordnungs-Ministerkonferenz werden kurz beschrieben, soweit sich die vorgenannten Gremien mit Fragen des Naturschutzes befasst haben.

Die wesentlichen Punkte der Naturschutzklärung der Europäischen Gemeindekonferenz sind zusammengefasst.

Dr. Münch stellt fest, dass konkretes Handeln auf örtlicher Ebene viel nützlicher ist als Ermahnungen durch eine auswärtige Stelle, die nicht den Vorteil der engen Beziehungen des Gemeinderats mit seiner Wählerschaft geniesst. Das sinnvolle Gestalten der natürlichen Umwelt ist als eine europäische Aufgabe anerkannt worden und muss von den Regierungen mit Ernst in Angriff genommen werden. Fähigkeiten müssen geweckt

werden und die Wirkung des Europäischen Naturschutzjahres 1970 auf die öffentliche Meinung muss aufrechterhalten, ja sogar verstärkt werden. Aber für die täglichen Umweltprobleme reicht das Handeln der Regierungen nicht aus. Der Erfolg dieses Unternehmens hängt letzten Endes ab von den Gemeinden und deren Bereitwilligkeit zu Experimenten und Neuerungen. Die Europäische Gemeindekonferenz ist entschlossen sicherzustellen, dass diese Verantwortung allen Regionen, Städten und Gemeinden Europas verständlich gemacht wird.

DER WANDEL DER LANDSCHAFTEN EUROPAS — S 9

FG Bremen, Generalsekretär der Internationalen Föderation der Landschaftsarchitekten, äussert zuerst einführende Gedanken zu einer Artikelserie, die sich mit dem Wandel der Landschaften Europas befasst. Diese Artikel wollen einen Überblick über die Entwicklung der verschiedensten Landschaften Europas geben und gleichzeitig die Punkte, die heute der grössten Veränderungsgefahr ausgesetzt sind, aufzeigen. Weiterhin wollen sie Hinweise geben was getan werden könnte, um diese Veränderungen ins Positive zu kehren. Bremen hebt hervor, dass die wachsende Geschwindigkeit der gesellschaftlichen Veränderungen unvermeidlich auch den Eingriff des Menschen in die Landschaft verstärken wird. Um bestehende Werte zu erhalten, ist es dringend erforderlich, Landschafts- und Landschaftsschutzgebiete zu schaffen, die Europa netzartig mit Grüngürteln durchziehen. Dies erfordert eine bedeutend höhere interprofessionelle und natürlich auch politische und wirtschaftliche Kooperationsbereitschaft in Europa als es bisher der Fall war.

KÜSTENSCHUTZ — S 10

Professor JA Steers

Dieser Artikel ist einer Studie über den Küstenschutz in Nordostspanien, Südfrankreich, Nordwestitalien, Cypern, der südwestlichen Türkei sowie in einigen Teilen der Niederlande, Westdeutschlands, Dänemarks, Schwedens und Norwegens entnommen. Prof. Steers bringt alarmierend ins Bewusstsein, dass der Tourismus und die industrielle Entwicklung weite Landstriche der europäischen Küsten unwiderruflich zerstört haben bzw. ernstlich bedrohen. Insgesamt gesehen haben die nördlichen Länder wirkungsvollere Massnahmen zum Schutz ihrer Küsten ergriffen als die südlichen Länder. Obwohl jeder Staat gemäss seinen eigenen Besonderheiten planen muss, unterstreicht Professor Steers die Notwendigkeit von nationalen Plänen und einer Politik zur Erhaltung der Küsten (empfehlenswert wären solche, die Richtlinien folgen, die auf europäischer Basis vorbereitet wurden). Nur eine durchgreifende Regierungspolitik kann den örtlichen Planungsbehörden diejenige Stärke geben, die sie brauchen, um der Versuchung zu widerstehen, eine Entwicklung zu forcieren, die Stückwerk ist und bleibt.

Verschiedene spezifische Probleme werden behandelt:

Der Kraftwagen, die Auswirkungen des Strassenbaus, der freie Zugang für die Allgemeinheit, die Bedürfnisse der verschiedenen Freizeitbeschäftigungen sowie diejenigen der Industrie.

Lösungsvorschläge der gestellten Probleme schliessen u.a. ein: Richtungsweisendes Planen in die Zukunft hinein, vernünftige Landschaftsgestaltung, sinnvolle Aufteilung der vorhandenen Flächen, vielseitige Verwendungsbreite, Information der Öffentlichkeit sowie interdisziplinäre Planungen.

DIE AUFGABE DER MOORE IN DER NATUR — S 17

Dr Matthews vom Internationalen Wasservogel-Forschungs-Büro beschreibt die Rolle, die die Moore im Wasserhaushalt der Landschaft spielen. Wie zum Beispiel ein Sumpf als Regulierungsfaktor auftritt, indem er überschüssigen Regen u. Schmelzwasser auffängt und speichert und so Überschwemmungen verhindert, jedoch andererseits während Trockenperioden langsam Wasser abgibt und so Versandungen flussabwärts verhütet. Eine kleine Störung im Wasserhaushalt führt zu Problemen, die weitere Massnahmen erfordern wie: Stauseen gegen Überschwemmungen, und Kunstdünger, um verschwundene Schlammablagerungen zu ersetzen, bis ein durch und durch künstlicher (und sehr teurer) Wasserhaushalt errichtet worden ist. Andere Aspekte der Sümpfe, die erwähnt werden, sind ihr Wert als Wasservogelreservate, als wissenschaftliche Forschungsobjekte sowie ihr Wert für Freizeit und Erholung.

Beispiele von einigen schnell verschwindenden natürlichen Sumpfgebieten werden gegeben. Jedoch werden auch andere Beispiele von künstlich geschaffenen Mooren zitiert, von ehemaligem Marschland, das durch Torfabbau zu neuen Sand- und Kiesgruben umgewandelt wurde, wodurch liebliche Seen entstanden, wo man Vögel beobachten und Boot fahren kann.

Die Schlussfolgerung ist, dass, genauso wie die Wasserversorgungsunternehmen sich zu einem fortwährenden Eingriff in den natürlichen Wasserhaushalt veranlasst sehen, auch Biologen in den Prozess der ökologischen Gestaltung der Umwelt eingeschaltet werden müssen, um die natürlichen Entwicklungsstadien von Wasser- zu Sumpfgebieten und dann zu trockenem Land zu verhindern bzw. um diese Entwicklung in den verschiedenen Phasen gemäss den jeweiligen geplanten Erfordernissen anzupassen.

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