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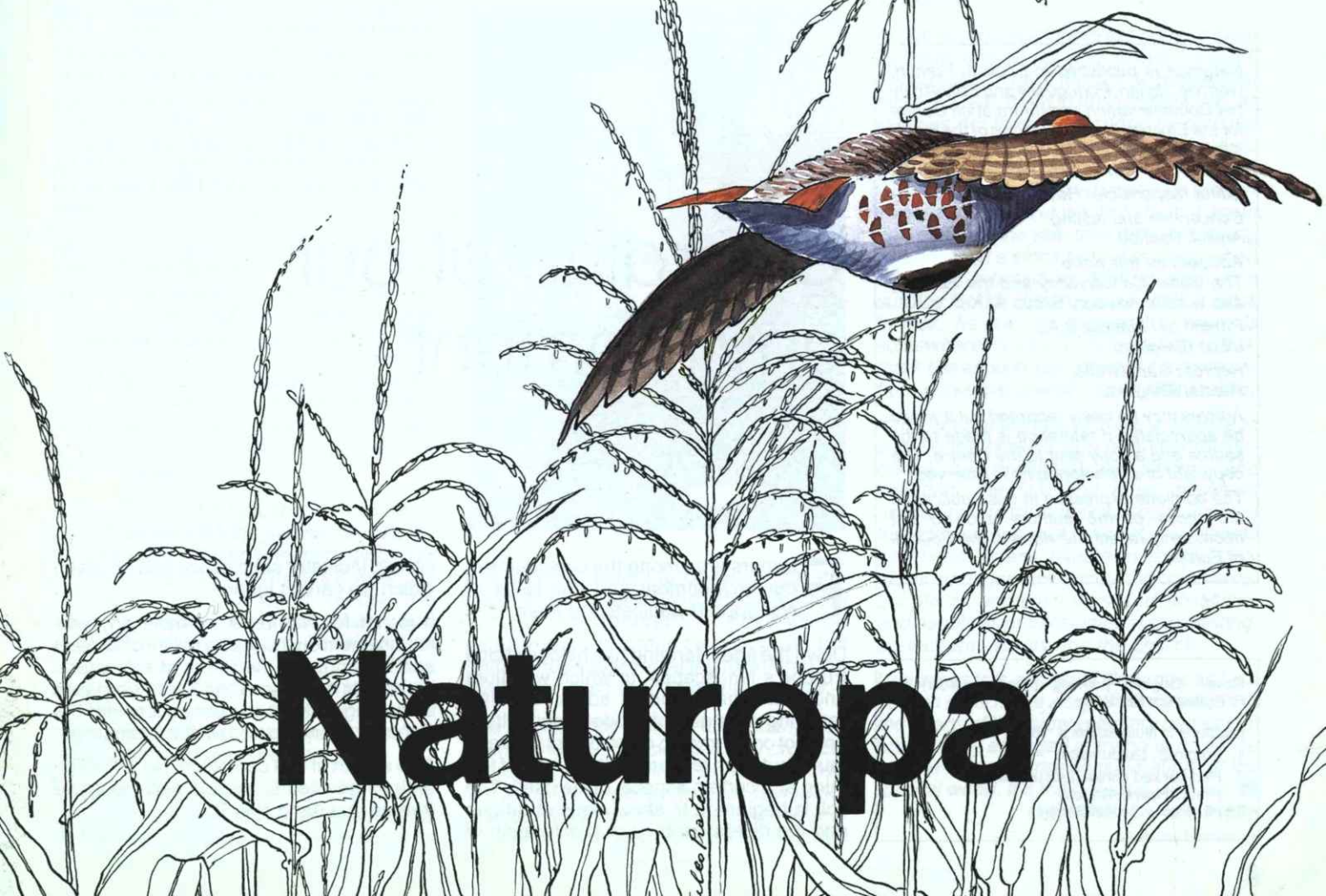

Naturopa

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Editor responsible: Hayo H. Hoekstra

Conception and editing: Annick Pachod

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2. Red-backed shrike (*Lanius collurio*) (Photo Heckel/Rauch)

3 to 5. Photo Heckel/Rauch

Guardian of our environment

Farmers are among the custodians of our environment and this issue of *Naturopa* is dedicated to them.

Down the ages, farming has helped shape Europe's landscapes, to which wild flora and fauna have had to adapt. The far-reaching changes of modern agriculture now not only threaten much of that flora and fauna but even jeopardise the future of farming and certain aspects of life itself. The soil is beginning to show signs of fatigue and the disappearance or proliferation of certain indicator species sounds an alarm which we cannot ignore.

It is not for *Naturopa* to make any pronouncement on the vast problem of farmers and farming. But the future of our natural heritage is its concern and this issue makes some suggestions in connection with the Centre's "Farming and wildlife" campaign.

Also as part of that campaign, No. 57 will be entirely devoted to the soil and the grave threats that hang over it.

H.H.H.

(Photo W. Lapin)

Editorial

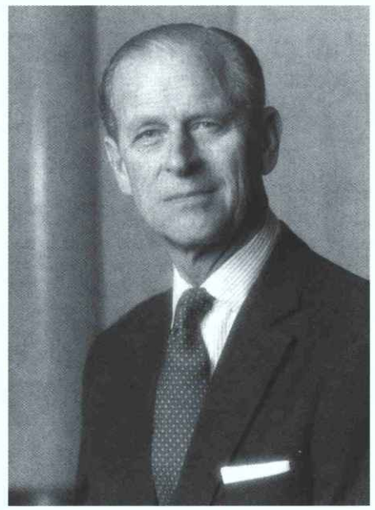
I suppose that, if pressed, most people would agree that there was something to be said for the natural world, but, as likely as not, you would have to explain to them what you mean by the natural world.

For those of us who are concerned with the conservation of nature and natural resources, the greatest problem is the lack of understanding of what we are talking about. People who live in cities seem to think that the countryside was put there for their particular benefit. They are unaware of the fact that their presence in the countryside in large numbers is causing erosion of the soil, that they are disturbing wild populations or that leaving their litter lying about is a danger to wildlife, as well as an unpleasant sight for those who come after them.

Many people who live in the countryside seem to believe that it is there for them to exploit. Up-rooting hedgerows, draining marshes, reclaiming tidal mudflats, all so as to increase the area under cultivation, may make economic sense, but it is disastrous for the economy of nature. Every such action reduces the habitat for native and migrant species. It may not kill any animals or plants directly, it simply destroys their ability to survive.

Trappers feel entirely justified in taking as many animals from the wild as they can lay their hands on. The only restraint felt by sea fishermen, sealers and whalers is when the numbers have declined below the economic minimum, and that means when they are close to extinction. The North Sea is bounded by so-called "advanced" countries, and yet only a few years ago the fishing for herring had to be stopped entirely as the stocks of this once prolific species had almost entirely disappeared.

Industrial development is not some phenomenon beyond human control, like the weather. It is planned and executed by people, and pretty intelligent people at that. Yet they seem blissfully unaware of the damage they are doing through the waste and pollution they are sending into the natural world. Some of the worst disasters have been perpetrated by the most highly trained chemists and engineers, as the recent release of toxic material into the Rhine and the explosion at Chernobyl testify.



It is difficult enough to persuade governments that they have a responsibility for the natural environment. Conservation measures are bound to be unpopular, but there is no excuse for failing to enforce the measures when they have become law.

The import into Europe of endangered animal and plant species and their products listed in the Convention on International Trade in Endangered Species is a major scandal. Wild chimpanzees taken to provide photographers on Spanish beaches with a cuddly animal for holiday-makers to hold while they have their pictures taken; snake skins for belts and shoes; the skins of wild cat species for furs and stoles; the list goes on but the control does not.

The sad thing is that the future of the natural world is not being threatened by deliberate policy or intent, it is being threatened by ignorance, selfishness, neglect, and indolence.

As the Bible puts it "there are none so blind as those who do not wish to see". Even if it is possible to get it through to people that there is a real threat to the natural world, as likely as not they will respond by blaming hunters. Illegal hunters and poachers do indeed do a great deal of damage, but the legal hunter has a vested interest in the survival of his prey. He wants to hunt it again next year and the year after that. He is doing exactly what a stock farmer is doing when he keeps a breeding stock to produce a surplus for the following year. Like a stock farmer, he has to ensure that there is somewhere for the quarry to breed and live, that it has enough food and that it is protected from excessive predation and disturbance.

If the natural world is to have a chance to survive the present rate of human disturbance, encroachment, exploitation, and pollution, the first and most important necessity is to try to make people aware of the consequences of their actions. People as private citizens, people on holiday, people as managers in industry and commerce, people as administrators and politicians and people as professionals in engineering, agriculture, fishery and the church.

I welcome this edition of Naturopa as I am certain it will make a significant addition to the efforts of the many voluntary bodies that are actively engaged in trying to convince people to have more consideration for the natural world. It's the only one we have. ■

H.R.H The Prince Philip
Duke of Edinburgh

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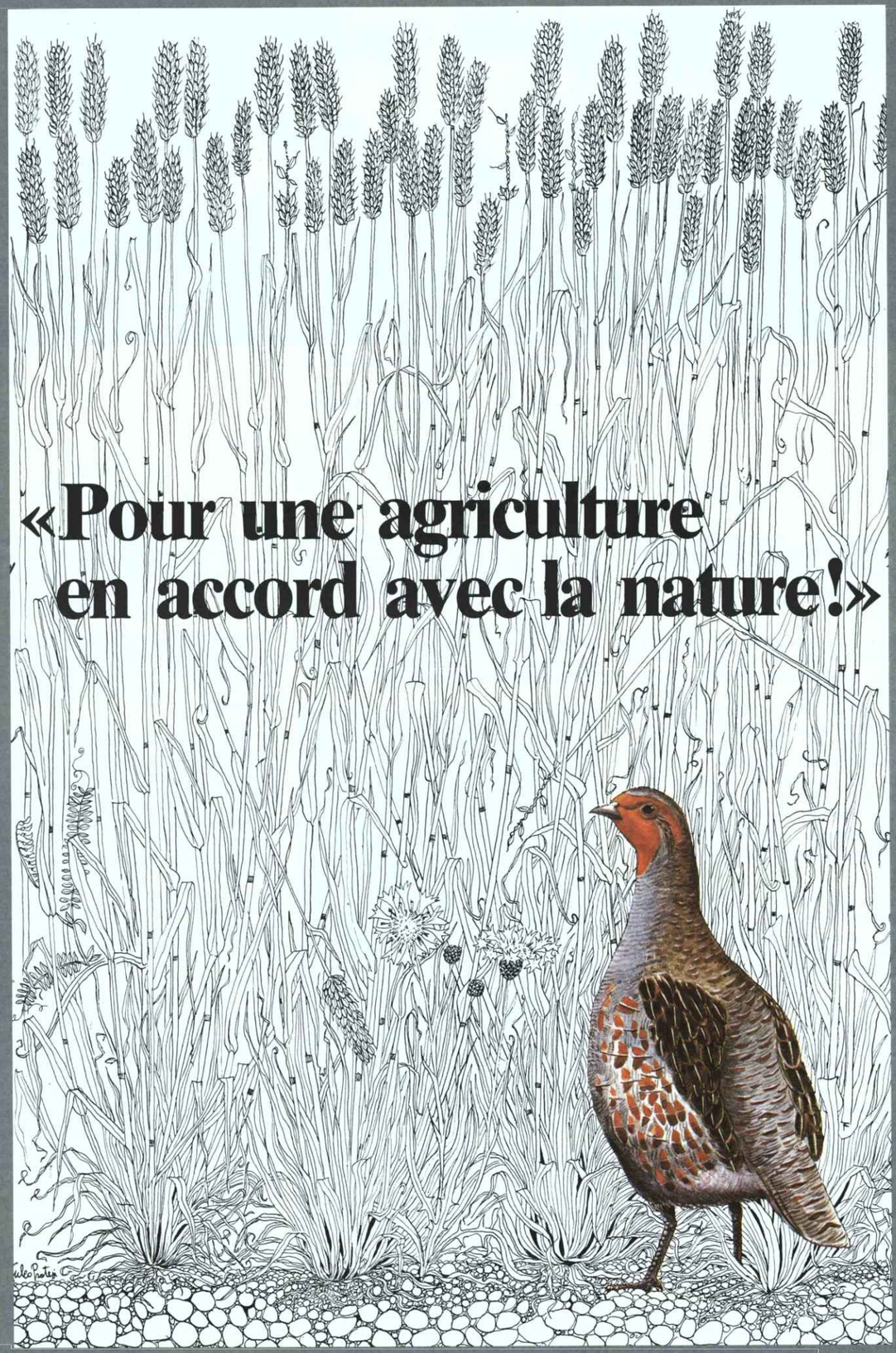


Contribution du Centre de documentation et d'information sur l'environnement et la nature à la Campagne du Conseil de l'Europe pour le monde rural:

«Vivons nos campagnes»

Agriculture and nature conservation

William H.N. Wilkinson

Farming since 1945 has probably been Britain's most successful industry. In response to the policies and incentives of successive governments , output and productivity have been increased enormously; the industry is competitive and well capitalised. Nevertheless profitability is under pressure and with most agricultural products in surplus, the future is, to say the least, uncertain.

Agriculture and wildlife habitats

Although agriculture has been exceedingly successful economically, modern methods of farming have brought about the biggest change and loss of wildlife and wildlife habitat that Britain has ever known. The figures cannot be ignored:
— 95% of lowland unimproved neutral grasslands, including herb-rich hay meadows;
— 80% of lowland sheep walks on chalk and limestone;
— 40% of lowland acidic heaths;
— 30 to 50% of ancient lowland woods;
— 140,000 miles of hedgerow;
— 50% of lowland fens, valley and basin mires;
— 60% of lowland raised mires;
— 30% of upland unimproved grasslands, heaths and blanket bogs.

Not all this is the effect of agriculture; commercial forestry is another important factor, and building development has also played some part. The major cause of these losses has however been intensification of agriculture.

At the same time the number of farm holdings has gone down from 451,164 in 1955 to 241,922 in 1985 and the number of full time farm workers from 555,000 to 206,327 in the same period. This was of course deliberate government policy in the late 1950s and 1960s when labour for industry was scarce. Nevertheless the downward trend continues as farming methods have intensified, larger capital sums are invested and the tendency to monocultures has increased.

Now at last the time has come for rethinking. How are the different objectives and uses for the countryside to be reconciled? Unless one is clear on where one wishes to go, it is hard to decide how to get there. In framing policies for the countryside, there are a number of objectives to be kept in view. The main ones are:

1. Adequate supplies of food should be grown and sold at a reasonable price, at a tolerable cost to the taxpayer. (It is doubtful under modern conditions whether a truly free market in food could ever be achieved or indeed would be desirable.)

2. Rural communities should be maintained at a standard of living comparable with their fellows employed in the towns.

3. The countryside should sustain as much wildlife as possible with its habitats conserved and the general environment, including water and air, unpolluted.

Farming and nature conservation have until quite recently been regarded as opposites, hostile to each other. Recently this has begun to change. Farmers, recognising that the scale of habitat loss undermined their position as the traditional custodians of the countryside, for the most part were as concerned as nature conservationists. Government too took more notice and gradually withdrew some of the agricultural grants and subsidies which had been so hostile to wildlife. In addition, the need to reduce output of practically every type of product gives scope for introducing measures designed to support wildlife at the same time achieving the objectives already outlined.

Interest in wildlife conservation in Britain is almost certainly higher than in most other European countries and the number and range of its non-governmental organisations far greater. Probably close on 2 million people belong to a voluntary organisation which has some interest in wildlife and its conservation. The National Trust with over a million members and the Royal Society for the Protection of Birds with 500,000 or so members, young and old, are powerful organisations by any standard. Their interest is expressed democratically through the parliamentary process and these pressures resulted in a fundamental piece of legislation, the Wildlife and Countryside Act 1981. This tidied up previous legislation and also set a new framework within which nature conservation and the statutory authorities should operate. In addition the Agriculture Act 1986 and the Wildlife and Countryside (Amendment) Act 1985 require the Agriculture Departments and the Forestry Commission to "achieve a reasonable balance" between their production objectives and conservation of the countryside.

(Photo J.-C. Chantelat)

Chains fixed to the tractor bar scare game and thus the farmer can localise nests or young before cutting

Sites of Special Scientific Interest

Probably the most well-known and most useful aspect of the Wildlife and Countryside Act 1981 is the requirement on the Nature Conservancy Council to notify those sites which it judges to be of particular value because of their flora and fauna and geological importance as Sites of Special Scientific Interest (SSSIs). This enables a fairly elaborate mechanism for protecting any one of these sites to come into play and, after all the consultation procedures have been completed, it is the Minister who ultimately determines whether the site shall be damaged or protected. There are, or will be, after the notification process has been completed, some 6,000 of these SSSIs covering about 8% of the land area of Great Britain. Within these, about 950 sites, many of which are of international importance, have been identified. These qualify for establishment as National Nature Reserves and so far over 230 of these have been set up. In addition there are a number of National Parks in England and Wales (but not Scotland where different legislation applies) and also Areas of Outstanding Natural Beauty (AONB) where certain types of planning procedures have to be applied before development can take place. Although many are of high wildlife importance, National Parks and AONBs are chosen on landscape and amenity criteria.

This national network of sites has to be fitted into the countryside as a whole or into what we call the "wider countryside", as distinct from the special sites. Generally speaking, wildlife cannot survive in isolation and larger populations of many species exist outside rather than inside the special sites, albeit less densely. It is therefore clearly important that steps are taken to safeguard wildlife in the wider countryside as well as protect the special sites. These are places such as rough grazings, heather moorlands, undrained and unfertilised hay meadows which we term "semi-natural vegetation"— those basically natural systems only modestly modified by man's activities over the centuries. These areas, and others of wildlife interest, tend to be of low agricultural value and have therefore survived though, in some places in southern Britain, the proportion of land having any wildlife interest at all is below 15%. In the north the position is much more satisfactory, at least at the moment.

Role of forestry

It is here that forestry comes in. During the two world wars, Britain, which has almost the lowest amount of woodland cover of any country in Europe, found herself critically short of timber supplies. Government therefore took a strategic decision to increase the amount of home-grown timber. As a result of this decision the amount of tree cover has increased to 9.7%. At the same time, however, there was a Government decision to boost British agriculture and the supply of home-grown food. This meant that only the lowest grade of land, usually in the uplands or on the coastal sand dunes, was made available by the agricultural authorities for tree planting. As forestry in these areas, which happened to be among the best for wildlife, expanded, increasing concern over the loss of good wildlife habitat began to be expressed, particularly as much of this planting, because of soil and climatic requirements, was of foreign conifer species such as Sitka spruce, and intrinsically poor for wildlife. Some of the methods of planting have been highly damaging ecologically and forest design has often invited justifiable criticism. These two last points are gradually improving. Nevertheless conflict is if anything increasing and seems likely to culminate in the possible planting of a large and unique area of peatland in Caithness and Sutherland, rare habitat even in world terms and one of considerable international significance. Some form of Governement intervention is expected, though at the time of writing it is uncertain what form it will take.

Returning now to the questions of agricultural overproduction, the nature conservation importance of certain areas of the wider countryside and the need to rethink existing forestry policies to make them more sympathetic to nature conservation, a window of opportunity is beginning to emerge. Although undoubtedly quite a large hectarage of land, some say as high as 20%, is surplus to the likely requirement of food production, there are a number of problem areas. Most British farmers see the need to reduce production but feel, quite understandably, that if they are expected to reduce production, their European counterparts should be expected to do the same. In certain sectors, notably cereals, limitation of production is being attempted, largely by price control. This tends to be bad from a nature conservation viewpoint as farmers attempt to maintain incomes by bringing more and more low grade land, often of high wildlife value, into production in order to try and cover their overheads. A restriction on hectarage planted is much more satisfactory. From a purely economic and efficiency point of view, the price mechanism is undoubtedly the best, but in order to bring supply and demand into balance, price reductions involved have to be draconian. The less prosperous and smaller farmers would be severely hit. Many would go out of business, farm sizes would increase and rural populations and prosperity would be greatly affected.

This seems to be generally perceived in Government circles and there are a number of interesting and helpful ideas which, if worked through correctly, could encourage wildlife, while at the same time reducing production and, if the appropriate level of funding were provided, maintain rural employment and incomes.

Environmentally Sensitive Areas and other measures

The first of these measures to be put into place, although it must still be regarded as experimental, is the declaration of a dozen or so "Environmentally Sensitive Areas" where farmers have an option, in return for certain levels of subsidy per hectare, to carry out their farming activities according to certain environmentally sensitive principles. The prescription varies according to the location, but usually involves much lower fertiliser application, no pesticides or herbicides, and low stocking levels. It is in effect a form of "extensification" which is under consideration in Brussels at the moment. It would be good from a nature conservation point of view if the principles of "environmentally sensitive" farming could be made widely available throughout Britain as a farming option.

Another possibility which is under consideration as a means of reducing cereal production and enhancing wildlife is the practice of leaving field headlands unsprayed. This encourages invertebrates and those birds that feed on them, such as the grey partridge, a game species that has suffered greatly from modern farming practices. The number of butterflies too increases dramatically. A number of farmers have experimented, generally successfully, with this approach. The idea could usefully be extended to the banks of streams and ditches, thus building up a network of wildlife corridors.

Encouragement for farm-woodlands, provided that planting avoided areas of high wildlife importance, and that the design and mix of tree species was satisfactory, could also be beneficial. If alternative uses for land on a large scale basis were to be envisaged, the fertile lowlands would permit the planting of a wider range of tree species. These would of course benefit from better growing conditions compared with the uplands.

The previous comments have largely applied to lowland Britain. The uplands present different problems. Farming in the uplands, which is mostly sheep and to a lesser extent cattle, will be increasingly difficult, especially as more and more lowland farmers take up sheep and are able to do so more competitively than in the hills. At present, many parts of the uplands are overgrazed from a nature conservation point of view. This clearly has long term dangers and leads to loss of wildlife interest. "Extensification" here as already mentioned has some relevance, particularly if linked to some hectarage payment scheme instead of the present system of headage payments which encourages overgrazing.

All in all, though the situation is fraught with uncertainty, the possibility of bringing agriculture and nature conservation together is better than it has been at any time since Britain became a member of the EEC. Schemes will however need to be worked out patiently and there will need to be alternative options to deal with the geographical range of Great Britain, reflecting the different farming systems within it. Adequate finance too will need to be available if the various objectives are to be met. The patient elimination of surpluses would help provide the necessary room for financial manœuvre. One thing is certain, all sides are aware of the problems and all are prepared and indeed happy to work together in partnership towards their resolution. ■

William H.N. Wilkinson
Chairman of the NCC
Northminster House
GB - Peterborough PE1 1UA

The uprooting of hedges, one of the often indirect causes of the decrease in wildlife

(Photo J.-C. Chantelat)

Yesterday, today, tomorrow...

Lord Plumb of Coleshill

I want to start with a word about yesterday's agriculture. Most of Europe's countryside is not "natural" but the product of generations of farming activities which have created European landscape, settlement patterns and habitats. The fact that it looks "natural"—and we must remember that two-thirds of the surface of the Community is devoted to agricultural production—is a tribute to farmers as guardians of the countryside.

We all recognise that what our farmers do today will affect the environment and the wildlife of the future. But we have to keep these matters in perspective. The emphasis of farming in all Member States of the Community, (and indeed throughout the world) has been on the need to increase production and incomes; we wanted to produce more food, and we wanted to produce it more efficiently. This is not only the result of the Common Agricultural Policy; it existed before the CAP was created, and stemmed from shortages in earlier years. But in the last few decades, which have seen the introduction and development of the CAP, Europe's agriculture has undergone a technological revolution which has profoundly changed farming practices and has had a marked impact on our countryside. I will not enumerate the problems that intensive farming practices have caused. They are well-known.

What is important is to realise that the rate of technological change will not slow down in the coming years and that productivity will continue to rise. We have to harness this continuing change to the new needs of today and tomorrow.

There is a growing concern about the effect of farming in the environment, and it is felt not just by city-dwellers who see the countryside as a pretty backloth to their journeys, but also by those engaged in agriculture, whose basic resources are soil, water and genetic diversity of plant and animal species.

Agriculture and the environment

The European Parliament's Committee on the Environment held a Hearing in 1985 on agriculture and the environment. This highlighted not only the contrast between agricultural production and environmental conservation, but also—and perhaps more significantly—the recognition by the rural community that it must pay more attention to environmental and conservation issues. This change of emphasis is reflected in the Community's measures for improving the efficiency of agricultural structures, which were adopted in 1985. These measures give less emphasis to increasing productivity (and thus production and surpluses) and more to encouraging practices which reduce production costs, save energy, improve living and working conditions and improve the environment. Environmentally Sensitive Areas have been introduced, and aid may be granted to farmers who undertake to farm in such a way as to preserve and improve their environment. We are switching from a system which aimed at maximising production, which inevitably has harmful effects on nature and wildlife, to one that takes more account of these factors. It is a slow process and in many respects it will be a painful one, but it is beginning.

With regard to conserving wildlife, the Third Action Programme on the Environment 1982-86 included measures to conserve flora and fauna and also to monitor the collection of wildlife and flora. In this area the Community is a party to several international conventions on the conservation of wildlife: namely on the protection of migratory species, and on international trade in endangered species.

A specific Community directive on the protection of birds is now in force and in the process of being implemented in the Community Member States.

Last year the European Parliament expressed the view in an own initiative resolution that the reform of the CAP provides an opportunity to establish a coherent agricultural policy which also seeks to preserve the environment and the rural way of life. It called for an overall policy for the CAP based on quantitative and qualitative objectives, with the following principal aims:

— rational land use and long-term land conservation, combined with protection of all natural resources;
— to change the concept of agricultural policy in such a way as to foster agriculture beneficial to the environment.

Stressing the need for a European land policy, the resolution called for measures to diversify crops and agricultural activities so as to reduce the incidence of monoculture. The resolution also asked for the application of the procedure of environmental impact assessment to all major agricultural schemes, infrastructure schemes with possible repercussions on agriculture and new, large-scale agro-industrial schemes. The Parliament also underlined the need for observance of Community Directives and international conventions on the protection of wild animals, since these last play an important part in maintaining and restoring the natural ecological balance.

The Parliament also called for measures to combat the risks of soil and water pollution associated with the production and excessive use of pesticides.

As far as wildlife is concerned, we have to recognise that conservation costs money, and requires the co-operation of national, regional and local authorities, as well as the co-operation of farmers, conservationists and the general public. Conservation is not just a matter of planting a few trees or maintaining an odd wood, or indeed, as some would have it, of reducing the amount of nitrogen we use. It requires thought, care and long-term planning. Landowners, managers and users must be trusted to care for the land, and this trust and commitment cannot be guaranteed by laws and regulations.

Examples of positive developments

I will give two practical examples of recent positive developments. In Britain, there has been in the last few years a growth of the Farming and Wildlife Advisory Group movement, supported by the Countryside Commission, the National Farmers Union, the Country Landowners Association and other important sponsors. I welcome this development, which brings together people with countryside interests—those engaged in farming, field sports, nature conservationists, water gathering, access and forestry. It is better to get together to discuss problems that arise than to get into a position of conflict or to expect problems to be solved by national or European legislation.

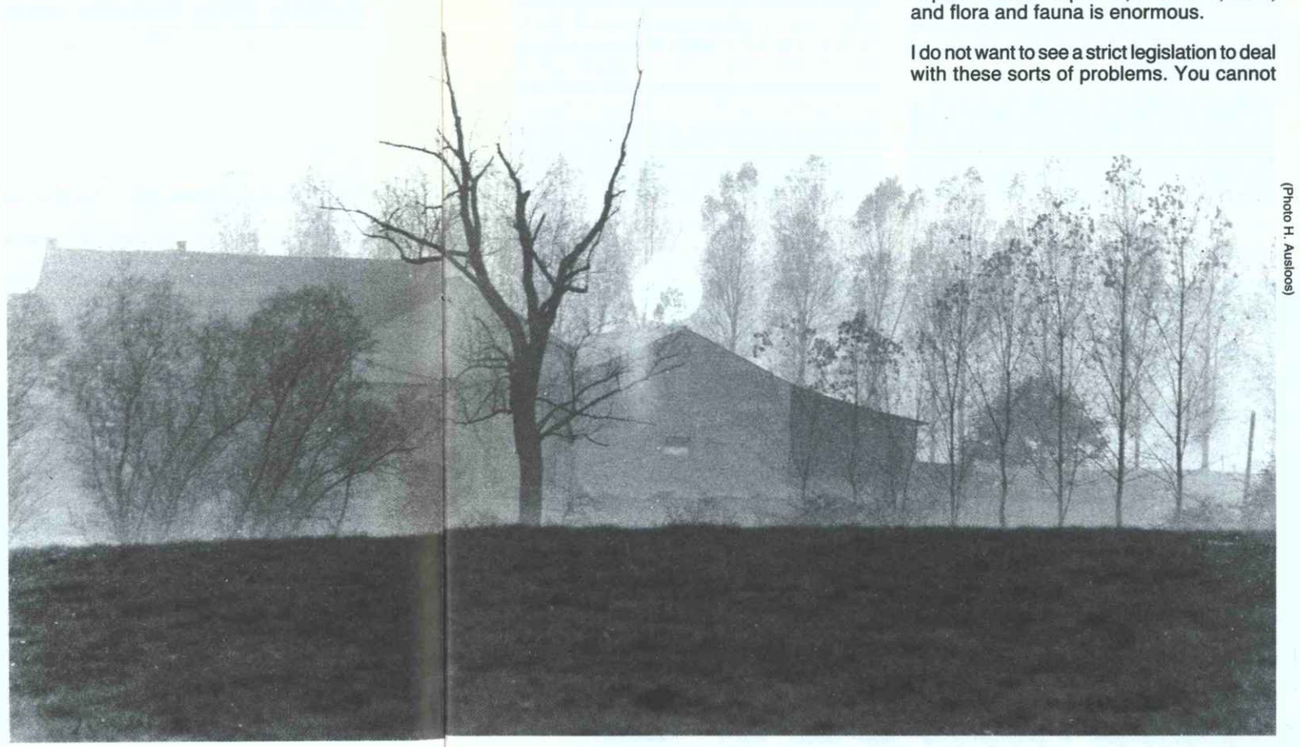
The second example is even more basic. If you avoid spraying with pesticides on a strip 6 metres wide round cereal fields, you get greater chick survival, no lessening of crop yield and only a small increase of moisture in the cereals at harvest, and the beneficial impact on wildlife species, butterflies, birds, and flora and fauna is enormous.

I do not want to see a strict legislation to deal with these sorts of problems. You cannot start legislating about which parts of a field should be sprayed with pesticide.

On the other hand the Netherlands did feel it necessary to apply restrictions on the use of animal waste in agriculture, and has even set up a "manure bank" in order to counter the serious effect on the soil of intensive farming. This programme is only one aspect of a Community-wide problem of soil conservation: It is estimated that 60 % of the soil is endangered, half of which is at high risk.

During this European Year of the Environment, what we have to do in our efforts to reform the CAP, with its wastefulness and surpluses, is to define the new demands: the desire for better quality foods; environmental needs; and the requirements of wildlife. We must take full account of these factors in framing our legislation. We can then create the conditions in which farmers and other land users can operate successfully. I do not believe that there will be a clash of interests between farming and wildlife, because we know that we have achieved more than 100 % self-sufficiency in most major products (timber is the big exception), and we no longer need to expand output by intensification of production in the way we have done in the past. The technological changes of the future must serve to meet the needs of the future, which include the conservation of wildlife, and not the needs of the past. ■

Lord Plumb of Coleshill
President of the
European Parliament



(Photo H. Ausloos)

Development of new techniques

Guy Jourdan

In the 21st century the development of new organic farming techniques will have greater implications for human and animal nutrition than the invention of the plough. The technologies in question are truly revolutionary, in that they constitute a move away from the methods used in Europe during the first half of this century, which were based on the intuition of farmers with no scientific training. They are even further removed from the methods that have prevailed since 1950, the evolution and adverse effects of which are described below.

Damaging effects of the farming policy of the 1950s

In the 1950s or thereabouts governments decided that agricultural production should be geared to maximum productivity in order to provide the exports allegedly needed to maintain the balance of trade in European countries, especially France. As a result, farmers were given biased advice and specialised training and were lured with the prospect of unprecedented profits obtainable almost immediately. Industry was only too happy to jump on the bandwagon. This was particularly true of the chemical and heavy machinery industries. They were strongly supported by the specialised banks, to which they were a new, inexhaustible source of profit, and benefited from drastic new land-use principles. Farmers, who had always been discontented with their lot, often with good reason, believed that their situation would improve miraculously as a result of the phenomenal methods on offer.

As a result, in less than 40 years farmers have been ruined or have become discouraged on account of their disproportionately high debts, the increasing barrenness of their land and rural depopulation (stemming from the reduced demand for labour)—a situation compounded by a short-sighted policy of drawing people to the big cities and incongruous social security contributions in the farming world.

What is there to say about the most disastrous result, which is indisputably the daily more obvious damage to human, animal and plant health?

Instead of trying to break this vicious circle as quickly as possible, intensive farming fanatics are striving in vain for profits which constantly elude them and imagine that they can make good their losses by means of even higher yields obtained with even larger amounts of soluble nitrogenous fertilisers, herbicides, pesticides and fungicides, which poison the soil, the water and the plants.

Fortunately, a few farmers, whose interest was captured by the very thorough, original studies pioneered throughout the world, have, in the meantime, started to open their eyes and ask themselves questions. If these advocates of organic farming were to suggest a return to the age-old methods, which are known to have uncertain results, there is no doubt that they would fail. The point is, however, that the technologies in question are brand new.

For a start, a thorough study has been made of the real needs of the environment and full account has been taken of all that is known about biology. Organic farmers begin by considering the type of soil, the needs of the plants, nutritive values, tillage techniques which meet these needs, sowing timetables, natural treatment processes, the biological control of predators by other carefully chosen predators and so on. In short, farming practice is totally reviewed with the aim of achieving optimum yield—which does not mean maximum yield—while preserving the integrity and vitality of the soil for the future activities of the farmer and of our descendants, protecting the environment, in the broad sense of the term, and producing healthy food at last.

Small rodents can be a serious threat to harvests if the natura balance predator/prey is upset

(Photo G. Lacoumette)

Compost-making: cow dung, garden rubbish, straw, various organic matters plus natural phosphates and algae
(Doc. "Nature et Progrès")

Cultivation techniques in organic farming

Organic farming cultivation techniques require great technical expertise on the part of the farmer in three areas:
1. the working of the soil;
2. fertilisation;
3. crop rotation and crop association.

Organic methods, in which nothing is left to chance, necessitate highly specialised training and fairly lengthy experience. Partial failure is very common when farmers have just switched over to organic farming and is accounted for by the relative complexity of the method. If farmers do not become discouraged, however, they are soon rewarded with good results:

1. Before tilling, a detailed study must be made of the type of soil and the seasonal variations in climate. It is most important to consider the soil as living matter containing a host of microscopic organisms that are essential to its fertility. This obviously means that there are rules to be observed. Deep tillage must be abandoned in favour of surface hoeing. The use of heavy machinery which packs the soil must be avoided and machinery must not pass over the soil too often. This list could be completed with a comprehensive description of tillage methods, but that is beyond the scope of this short article. It is, however, worth pointing out that animal haulage, which has now been completely abandoned, can be advantageous for the preparation of certain types of soil and, in certain cases, for harrowing when crops are closely-planted.

2. Fertilisation is mainly organic, which is why the term "organic farming" is normally used for farming based on a biological approach. Instead of fertilising with nitrogen, potassium and phosphorus in the form of synthetic chemicals, which are now known to harm the soil, the plants and the water, the farmer adds to the soil all the elements the plant needs, and will draw from it, in the form of a natural fertiliser, usually compost which has been scientifically prepared from plant waste, straw and thoroughly decomposed manure. This explains why it is easier to practise organic farming if stock-farming and crop-farming are combined. The type of stock-farming is unimportant, it will depend on the farmer's inclination and circumstances. It should not be forgotten that cereal straw is a noble material and is overwhelmingly important in the fertilisation process and for cattle fodder. The stupidity of those who indulge in the all-too-widespread, although prohibited, practice of burning stubble—which in addition causes deterioration of the surface oligo-elements—is astounding. The small amount of potassium added to the soil in the form of burned stubble ash does not offset these very real hazards. In certain cases organic manure can be supplemented with limited quantities of minerals which are insoluble in water, with such animal derivatives as bone meal or horn meal and with marine plants (*algae*).

3. Single-crop farming is highly unadvisable. It exhausts the soil to no purpose and makes it necessary to add ever-increasing quantities of soluble chemical fertilisers, the hazards of which are well known. The answer is carefully planned rotation of the crops, for instance of cereals and leguminous plants, which can be alternated and, in many cases, even combined. Leguminous plants provide natural nitrogen in a form which can be fully assimilated by the crop. The leguminous plants can either be dug in as green manure or reaped to provide excellent fodder. Here again, serious study and experience provide the answers to the difficult choice of seeds, species and crop rotation arrangements. In the case of both plants and animals, it is usually worth choosing species which are long-established in the region in question, many of which are dying out because of absurd considerations relating to hypothetical yields. These breeds and species, which are invariably hardier than our modern hybrids and are well adapted to the climate and environment in the areas in which they originate, give better results in the long term and require less care.

Consequences of pesticide abuse

Thanks to the work of the distinguished Professor Chaboussou, it has now been proved that pesticide abuse weakens plants, which actually become sick in the same way as people and animals that ingest or inhale pesticides. Paradoxically, therefore, pesticides have the opposite effect of that which is intended, and this indirect adverse effect compounds their direct toxicity. If people stop using synthetic chemicals they will strengthen the natural resistance of plants to disease and to attacks by parasites, for an ecological balance will be struck between the plant and its ecosystem, making direct control virtually unnecessary.

In certain serious cases, however, it is permissible to use, temporarily and in moderation, natural non-toxic products derived from plants, such as Rotenone and pyrethrum. Aroma therapy (spraying with certain aromatic plants soaked in water), is also used successfully to keep insects at bay. Another much more elaborate form of control, which is difficult to carry out but produces spectacular results, is "biological control", i.e the breeding of insect species which are the natural predators of other undesirable species, e.g. ladybirds against aphids and a certain fly larva against the European corn borer. Ultramodern technologies are not used only for production: they are also needed for processing produce, whether of animal origin—butter, cream, cheese, prepared meat products, eggs and poultry, honey and its derivatives—or of plant origin—flour and its derivatives (bread, biscuits, pastry products), dried fruit and herbs and medicinal plants, which are dried and packaged by means of special techniques. In short, anyone using organic processing methods always seeks to preserve the intrinsic quality of the starting product and to avoid doing anything that might denature it or in any way impair its natural quality. Biological qualities are thus fully preserved throughout the food chain.

Advantages of the new methods

Everyone can benefit immensely from these new methods.

The main benefit is, of course, a health one, for the wanton use of synthetic chemicals leads to the accumulation of toxic residues, which are transferred to food and thereby to tissues, where they gradually damage people's health. People who use such products without taking precautions have even been known to suffer virtually instantaneous death. If people stopped using them and, at the same time, used natural, alternative medicines and adopted a less stressful lifestyle, there would be only half as many people in hospital and, at the same time, the financial problems of social security systems would be solved.

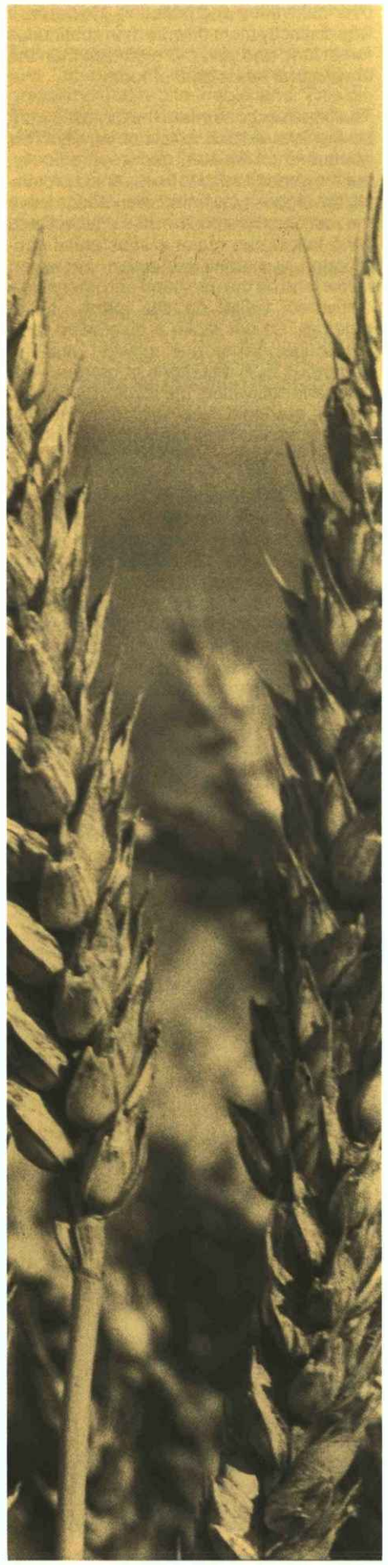
This paradise will not, unfortunately, be created overnight. It must be admitted that immediate, universal application of these techniques on a large scale is hardly feasible. The environment has been too seriously damaged for good results to be achieved in the time-scale necessitated by economic constraints. Nevertheless, pollution of agricultural origin has become so serious and the over-production crisis so scandalous when set against the malnutrition in the under-developed countries that there is an urgent need to take immediate steps to encourage the practice of these new, non-polluting farming methods. The price to pay will be lower in the long term.

There is an equally urgent need to persuade third world peasants to stop growing, for export, industrial crops which throw the North-South market out of balance and require unduly large quantities of chemicals. Instead, let us suggest that they grow food crops locally, and help them, by means of education and training, to grow and raise animals that are adapted to their climate and their environment, without interfering with their lifestyles. The humiliating food aid currently provided—which is disorganised and badly distributed, at that—could be stopped, for the population would be self-sufficient.

The social and economic advantages of these new methods are equally obvious. Organic farming, which is generally practised in family units but requires a modicum of outside labour since it is less highly mechanised, encourages many young people to return to the land, thereby relieving congestion in cities and reducing unemployment. Moreover, the need for special tools revives craft trades in rural areas.

The most spectacular and striking economic repercussion is the restoration of the country's balance of trade and the end to the foreign currency drain (as a result of the reduction in imports of fuel oil, soya bean, fertilisers and machinery produced abroad). The authorities are rightly advocating energy-saving. The chemical industry and excessively mechanised, production-oriented farms are huge energy consumers.

(Photo H. Ausloos)



Official French logo for biological agriculture

Organisation of organic farming in France

In France highly satisfactory arrangements for promoting and practising organic farming, distributing the produce and providing training are made by non-profit-making national and international associations, some of them of over 20 years' standing, whose members include not only highly specialised technical experts in each discipline but also farmers, people who process food, suppliers, sales co-operatives and consumers. All this effort is, in the final analysis, for the benefit of consumers, so it is only natural that they should be involved. The Fraud Department of the Police also has a very important role to play, together with all those involved, in averting the serious risk of bogus "organically grown" produce. Many unscrupulous suppliers, taking advantage of the growing consumer demand for healthy, natural products, sell, with a blaze of advertising, products labelled "organically grown" which, although they sometimes look quite appetising, are not free from toxic residues. Some time ago, therefore, the associations mentioned above drew up very strict "specifications" for all types of farming and processing and, after numerous strict checks, about which it is impossible to go into detail here, they deliver labels certifying the origin of the products, which can be used by the producers.

Lastly, the authorities, which very recently acknowledged the feasibility of farming without using synthetic chemicals, have set up a Specifications Approval Board (Commission d'homologation des cahiers des charges) on which all those concerned are represented. On 9 June 1986 the Board approved, for the first time, organic farming specifications for unprocessed plant products. Holders of the relevant certificate are authorised to use the official "logo", which provides an absolute guarantee that the food is organically grown. Specifications for other products will shortly be approved. Thanks to close co-operation between specialised associations and the authorities, France is ahead of all the other European countries in defining and controlling organically grown produce and thereby safeguarding the consumer.

The number of farmers using organic methods, including the holders of the certificates mentioned above, is still relatively small, although demand far exceeds supply. One of the main roles of the associations, whose efforts have recently resulted in official recognition for organic farming, is therefore undoubtedly to encourage and train farmers who are prepared to switch over to this type of farming. The associations aim to provide technical assistance, carry out field experiments in real-life situations and, of courses, encourage scientific bodies specialising in agronomy to carry out basic research.

Many private agricultural colleges have started to teach organic farming methods. The institution of official organic farming and organic-farm management qualifications has done much to give credibility to these courses. These qualifications are awarded on the basis of a competitive examination at the end of course run by approved public agricultural colleges (Order of 10 July 1986). Private and public sector training and research and experimentation are under way. Now there is no stopping this trend, which is essential for the sake of quality, environmental protection and health protection, and is necessary if the growing consumer demand is to be met.

We can conclude from all this, without any risk of being mistaken, that organic farming, in the strict sense of the term, is the real solution of the future. This form of farming does not just hold out hope: it is a necessity which cannot but become a reality. ■

Guy Jourdan
Administrateur "Nature et Progrès"
"Chantereine"
La Celle-sur-Loire
F - 58440 Myennes

Extensive exploitation programmes

Fridtjof Ziesemer

Ernst-Wilhelm Rabius

In 1985 a programme for promotion of extensive (i.e. less intensive) land cultivation was launched in Schleswig-Holstein, the most northerly Land of the Federal Republic of Germany. During the first year it embraced some 800 hectares, and in 1987 this figure is expected to rise to 18,000. The associated costs have risen from just under DM 300,000 to DM 7.75 million per year. This is an unusually rapid rate of growth, and hence it may be of interest to enquire into the underlying reasons for the programme and for the enthusiastic response on the part of farmers.

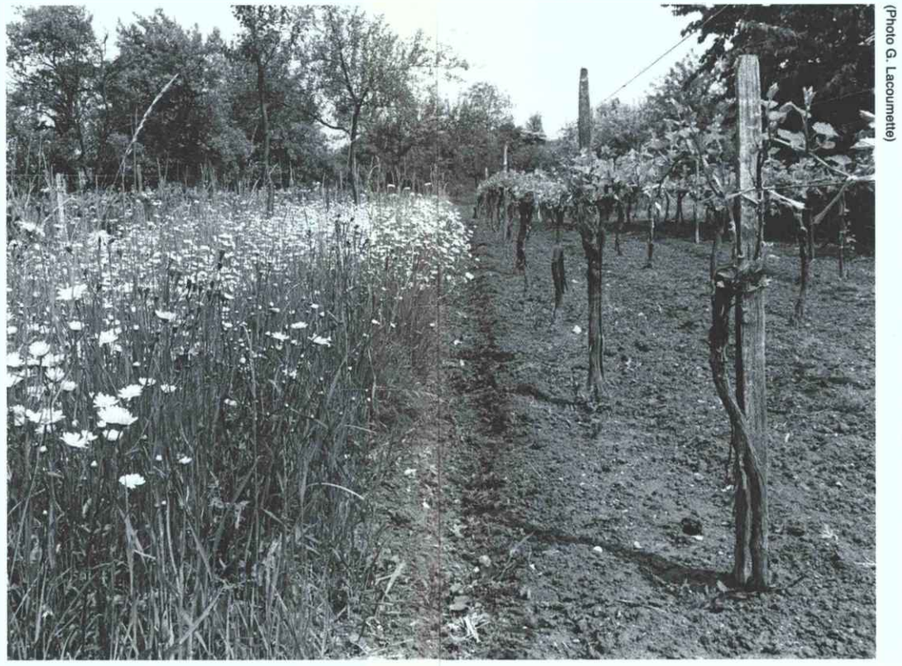
Consequences of the intensification of agriculture

The decline in the number of species extant on our cultivated land surfaces is unmistakeable. The stage has been reached when 40% of all plant species indigenous to Schleswig-Holstein are on the danger list, and for plant communities the figure is even 70%. Among animals the situation is similar. This trend is closely associated with the intensification of cultivation. 70% of the area of Schleswig-Holstein is now used for agricultural purposes, and under the pressure of the EC agricultural policy this process has to take place on an ever more "rational" basis, with ever less room remaining for wild flora and fauna. A nature protection policy which concentrates principally on the preservation and development of non-used areas—e.g. in nature reserves—is in these circumstances no longer adequate to guarantee the survival of the numerous species and symbioses present in cultivated regions. Progress in protective measures in selected tracts of agriculturally exploited areas is necessary to achieve this aim. Here, the co-operation of farmers is essential. Their forefathers transformed the original Schleswig-Holstein forest into an agricultural landscape, distinguished by the variety of its individual forms of land use. It became the scene of combinations of relatively dry and relatively wet, more intensively or less intensively grazed, and more frequently or less frequently mown meadows and pastureland, along with grassland bearing wild plants and less intensively used wall hedges, woods and fenlands. This scheme also had its drawbacks, occasioned by local over-cultivation and pollution. However, it was distinctly more diverse than continuous forest land and also more diverse than the agricultural landscape of today.

The time has gone when the farmer's work on the land tended to favour variety. This phenomenon does still occur sporadically, but the general trend is to use areas promising the highest yield intensively and to leave the rest uncultivated. It is also true that land lying fallow can make a substantial contribution to nature protection. However, fallow land on the one hand and intensively cultivated fields on the other, taken together, do not make a diversified farm landscape. What are missing are the numerous manifestations of more or less extensive cultivation, the result of which are marsh marigold and orchid meadows, rough grassland and other habitats rich in natural species.

Under the pressure of economic constraints farmers are no longer in a position to preserve the symbioses without outside help. Here is where the programme to promote extensive cultivation comes in: it makes provision for farmers voluntarily to conclude contracts with the government of Land Schleswig-Holstein, in which they agree to undertake extensive cultivation of their land. They are compensated for the resultant lower yields.

Non-treated or fallow areas are the "pharmacy" of wild animals



(Photo G. Lacoumette)

Contractual conditions

The programme comprises nine contractual variants, of which seven apply to grassland and two to arable land. This differentiation is necessary in order to allow for various local conditions for the varying aims pursued by nature protection. The areas selected for support and the type of contract to be applied are therefore geographically sharply defined and laid down.

In general, the following conditions apply to grassland:
— use as permanent grassland;
— no lowering of the water level on wetlands; no irrigation of drylands;
— no application of chemical plant protection agents;
— no mechanical cultivation of the areas concerned during the breeding or principal growing season;
— limitation of the head of livestock on the land.

Farming under these conditions means also a reduction in fertiliser use, since with late mowing and smaller numbers of livestock heavy fertiliser applications are not justified. Only on poor soils is fertilisation completely prohibited, in order to preserve and develop the rare plant communities typical for such regions.

On land that is neither excessively wet nor excessively dry, only fairly modest results would be achieved through extensive cultivation alone. However, when they are interspersed with non-denatured structures, such areas constitute important habitats for amphibians, for example. Such structures may be represented by wall hedges, woods and copses, and ponds and streams. Hence a contractual variant entitled "protection of amphibians" makes provision for the improvement or new creation of such structures. A longer-term objective here is to join them up into a continuous network. The cost of these measures is borne by the Land, and amounts to several million DM per year. The response of farmers has been so positive that the "amphibian protection contract" has in the meantime assumed a prominent role within the programme.

As compensation for lower agricultural yields, DM 350-400 per hectare and year are paid for the various grassland contracts. The contracts initially have a term of four years.

For arable land two variants are offered:
— no use of plant protection agents or application of mechanical weed control on a strip 3-6 m wide along cereal and rape fields, in order to protect the local wild flora and the fauna depending thereon;
— non-cultivation of strips 5-24 m wide, which are to remain fallow for 1-2 years. Here another herbal flora develops, and if it is allowed to remain during the cold season, many insect species over-winter in it. Small animals also find food and shelter.

Hunters are also interested in this programme and lend it their strong support, since wild and medicinal herbs have become rare on intensively cultivated arable land. Unsprayed or fallow margin strips are the "pharmacy of the game population"!

Depending on type of contract and land quality, the subsidy ranges from 3 to 15 pfennig per m^2; contracts are concluded for 1-2 years.

Reactions

From the start the programme evoked so much interest among farmers that not all applications for support could be considered. Here, a significant factor has been that, in wide areas of Schleswig-Holstein, only milk production is economically viable, but the income potential from this branch has been reduced through quota arrangements. In the search for alternatives, the performance of services to nature protection has now become worth consideration. Contracts with limited restrictions on cultivation are naturally more popular than those which are more onerous to fulfil. Here the experience gained during the first years must show where contracts require to be amended, in order on the one hand to achieve the purposes of nature protection and on the other to remain within the realm of the practicable.

Prospects

The form to be taken by future EC programmes for reducing agricultural production will also have a substantial effect on the Schleswig-Holstein scheme for more extensive cultivation. The programme of a single Land cannot solve the agricultural surplus problems caused by the EC agrarian policy. It is likewise not appropriate to reduce over very wide areas the quantities of plant protective and fertilising agents applied to land and water. In a voluntary programme the extensively cultivated lands will remain a minority scattered among intensively used lands for as long as the overall conditions governing agriculture undergo no significant change.

The Schleswig-Holstein programme for promotion of extensive cultivation is helping threatened symbioses of plants and animals on agricultural land. However, it cannot replace a new orientation of agrarian and environmental protection policy. ■

Fridtjof Ziesemer
Ernst-Wilhelm Rabius
Landesamt für Naturschutz und Landschaftspflege
Schleswig-Holstein
Hansaring 1
D - 2300 Kiel 14

Hedges, effective aids to agriculture: as windbreaks, they stabilise the soil, limiting erosion and feeding the groundwater. They also provide shelter for many species of animals and plants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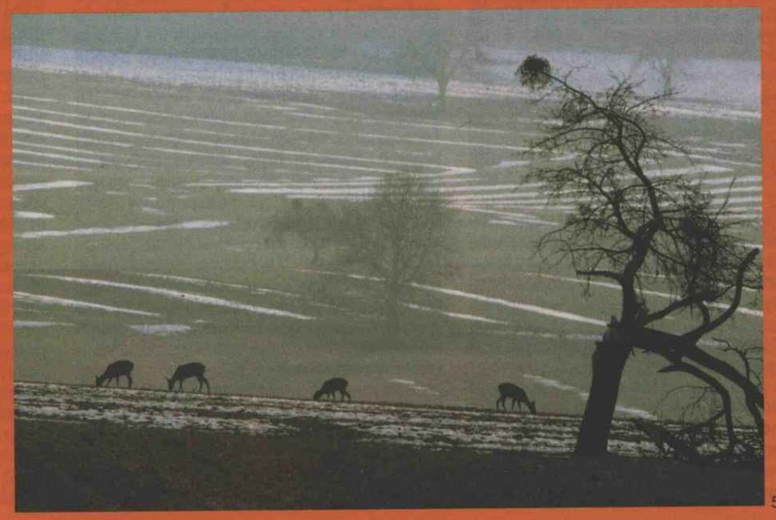
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(Photo G. Lacoumette)

Action on information

Eric Carter

The landscape of any developed country is almost entirely man-made and the result of countless decisions taken over many thousands of years by those who manage the land. The ways in which the land is managed will not only influence its appearance but will also affect the wildlife which it supports.

In the UK the landscape has developed over the centuries in response to the needs of agriculture and forestry and of the rural community. Farming has changed the countryside by clearing forests, draining wetlands, levelling fields and dividing large, open fields into smaller enclosures to meet the needs of new agricultural technology. Hedges and stone walls which are such a well known feature of the British scene may be ancient and often mark parish boundaries, but in the Midlands and eastern England many hedges are no more than 200 years old. They were planted to divide the open fields during the enclosure awards at the end of the 18th and early 19th centuries. This was also the time when the large landowners set out their estates for fox hunting and game shooting.

Changes in farming techniques

During the years following the Second World War the UK Government, along with the governments of most other countries, actively encouraged agricultural development and expansion. Every effort was made to stimulate food production and to provide farmers and landowners with a sound base from which to develop the agricultural industry. Research, both state funded and private, was devoted to higher crop yields, better livestock performance and pest and disease control. Mechanisation replaced human and animal labour. Advisory and extension services, both state funded and from industry, became highly efficient in transferring new ideas to farmers and growers who were eager to use them on their farms.

The new technology proved to be outstandingly successful and output soared so that from producing less than half its food supplies in the 1930s the UK now grows over 60% of its total food and 80% of the temperate foods that could be grown in the country. This is a success story and all concerned, farmers, extension workers, research scientists and the support industries, have every right to be proud of what they have achieved. But many of the commodities are now surplus to requirements and questions are raised as to whether it is right to encourage maximum production and the use of finite resources if so doing results in major changes to the countryside and the loss of valuable wildlife habitats.

Changes in farming techniques in the 1950s and 1960s led to changes, not all of which were acceptable to those whose interests lay in the appearance of the countryside and who were concerned for its wildlife. Hedges have been removed to create larger fields for modern machines, grazing livestock have moved indoors or to the wetter, grass-growing western parts of the country, making hedges redundant as stock-proof boundary fences. Isolated trees and small woodlands have been swept away where they obstructed cultivation and wet areas have been drained. Most crops now receive a wide range of pesticides in order to ensure that they are free from weeds, insects and fungal attacks and in some instances these can have disastrous effects on wildlife. The grey partridge, once a common bird of arable farms throughout the whole of Europe, has declined so that in some parts it is now quite rare.

Towards a compromise

In 1967 a small group of farmers, agricultural advisers and conservation specialists, concerned about the changes that were taking place in the countryside and the increasing polarisation between farming and conservation interests, met to seek areas of compromise. This meeting, at the headquarters of the Royal Society for the Protection of Birds, showed that there was a good deal of common ground and that the conflict between agriculture and the rural environment was perhaps more apparent than real. Those concerned felt that positive action was needed to demonstrate, as widely as possible, just what could be done and this led to the Silsoe Conference in 1969, an important event with far-reaching consequences. Farmers, agricultural experts and conservation specialists came together to study a working farm. Their aim was to devise ways in which it could be operated profitably whilst paying due regard to the conservation of wildlife and landscape. A great deal of work was involved in preparing the scene and the farm was very carefully surveyed so that records were available of the numbers and species of birds, mammals and plants, together with full details of the farming operations. The study showed that it was indeed possible to combine successful farming with wildlife and landscape conservation and a subsequent report attracted a great deal of interest in political circles and in the press.

The Silsoe Conference was to be the first of many and whilst it dealt with arable farming, others which followed covered special areas, all of which were thoroughly researched and reported. These events and the perceived need to bring farming and conservation interests closer together led to the establishment of the Farming and Wildlife Advisory Group (FWAG) as a forum, where information and ideas could be exchanged. The techniques of survey and assessment devised for the studies now form the basis for farm plans which are prepared by the Farm Conservation Advisers of FWAG and others working in this area.

The series of conferences and many other similar local events showed how valuable it was to bring farmers, landowners, agricultural scientists, and conservation interests together in order to pool their expertise about countryside management. Members of the original national group were invited because of their interest and commitment and drawn from the wide range of organisations concerned with countryside management. These included the National Farmers' Union, the Country Landowners' Association, the Forestry Commission, Ministry of Agriculture, Fisheries and Food, the Royal Society for the Protection of Birds, the Royal Society for Nature Conservation, Nature Conservancy Council and the Countryside Commission.

Although much was being done to change attitudes and create a better understanding, it was clear that the organisation had to move even closer to practical farming.

Farming and Wildlife Advisory Groups

The National FWAG encouraged the establishment of similar local groups and county groups have now been formed, on an entirely voluntary basis, covering the whole of England, Scotland, Wales and Northern Ireland, 65 in all.

Each County FWAG (or FFWAG, Farming, Forestry and Wildlife Advisory Group in counties where forestry is important) is entirely independent and in no way controlled by the National FWAG. They run their own affairs within the FWAG philosophy, drawing on the central organisation for supplies of advisory literature; they also receive a newsletter twice a year. The National FWAG and its Adviser handle matters which need to be dealt with on a national rather than a local basis and give support to the local groups.

A county group is a partnership between all the organisations concerned with the management of the countryside. Its most important function is to provide a forum where the many countryside interests can meet in order to discuss problems and learn to appreciate and understand each other's points of view. The Chairman is almost always a farmer or someone very closely connected with farming, perhaps an agricultural adviser. This encourages farmers to see the group as helpful and supportive and not just another body trying to tell them what to do. The county groups offer advice to farmers and landowners on how to integrate wildlife and landscape conservation sympathetically with practical farming. In an increasing number of counties this advice is given by a full-time Farm Conservation Adviser working with the group. Farmers welcome their recommendations which they see as being unbiased. The advice, though not directly linked with agricultural productivity, recognises the place of modern farming technology and always takes into account the needs and objectives of the farmer.

Farm Conservation Advisers

Farm Conservation Advisers have a sound practical and theoretical knowledge of conservation, together with an understanding of modern farming practice. During the last three years 37 Farm Conservation Advisers have been appointed and it is hoped to fill more posts in the near future. The appointments have been made possible through a generous start-up grant of 50% from either the Countryside Commission for England and Wales or the Countryside Commission for Scotland. The remaining money has been found by donations and contributions from farmers, landowners and others in the county concerned. In addition, the Farming and Wildlife Trust has raised substantial funds nationally with contributions from charitable organisations and many of the major agricultural companies.

The Farm Conservation Advisers visit between 3,000 and 3,500 new farms each year, by invitation, and advise on tree planting, woodland management, creating new ponds and managing old ones, managing species-rich grassland and other conservation measures. They are in great demand with waiting lists of farmers wishing to consult them.

Farming and Wildlife Advisory Groups also attend shows and demonstrations and arrange conferences and farm walks. Groups are also closely connected with a

(Photo Heckel/Rauch)

Whinchat (Saxicola rubetra), typical and threatened species of the rural environment

number of competitions sponsored by a countryside magazine, the agricultural chemical industry, banks, agricultural shows and others. These offer recognition of the role which farmers play in conserving the countryside and provide prizes and awards to those who are judged to have made the most substantial contribution.

Farmers need encouragement and help, not threats. They are keen to know what is on their farms and how best to look after it. FWAGs help by providing the necessary information, advice and support.

For an attractive and viable landscape

Many important wildlife and landscape sites are protected as Nature Reserves, Sites of Special Scientific Interest or Areas of Outstanding Natural Beauty. But it is the land outside these special areas, the vast majority of the countryside, which is of the greatest concern to the general public.

The uncropped semi-wild areas on farms are of most interest to conservation, providing valuable wildlife habitats and landscape features. Farmers and landowners can make an important contribution to conservation by leaving these alone, since once they are removed they cannot be recreated.

Farmers and landowners are responsible for over 80% of the UK countryside and it is vital for the future of a prosperous agriculture that they remain able to respond to demands for new crops, make use of new technology and deal with the short-term effects of weather and pests. If they are to retain this then all those concerned must be aware of their responsibilities. Farmers, landowners, those who advise them, research workers and those responsible for agricultural education all have a part to play.

Everyone concerned with farming and the countryside, in whatever capacity, accepts that action must be taken to control agricultural production so that output comes closer to market demand. The change will inevitably be painful for some and will be made more easily if those concerned are given time to adapt. There are some who would wish farming to turn back the clock to some imagined golden age when farmers and farm workers produced food by simple methods and everything was "natural". But the past was never like that and we cannot abandon or ignore new technology. What we need is a better understanding about what is involved, an appreciation of the needs of farming and of the needs of the wider countryside. Compromise is possible. The introduction of Environmentally Sensitive Areas offers farmers the chance to practice more environmentally sensitive agriculture with payments for doing so.

This concept shows the way towards a policy which recognises the positive contribution which agriculture and conservation can make to an attractive and viable countryside.

The FWAG philosophy which brings together the many countryside interests has certainly exerted considerable influence in the UK. The concept will be of interest to others and may, perhaps in a modified form, be of practical help in solving the problems of integrating wildlife and landscape conservation into modern farming systems in other countries in Europe. ■

Eric Carter
Adviser
National Farming and Wildlife Advisory Group
The Lodge
GB - Sandy SG19 2DL

The agricultural landscape

Hermann Schacht

In his "Historia Naturalis", Pliny the Elder wrote that "... the earth is gentle, generous, forbearing and always at the service of mankind...".

It is more than 8,000 years since Europeans began systematically to tame and domesticate animals and to sow seeds and cultivate plants. The whole process of taking over the countryside for farming was a really slow and gradual one until about the middle of the 19th century.

Up to that point, farming had been varying the structure of large areas of the countryside, something that was also of great ecological significance. Nature had covered the whole of central Europe with forests—with the exception of the high Alps and a few other areas—but farmers broke this forest cover up and created a more varied countryside with a richer structure.

The agricultural landscape

This period saw the creation of the image of the "traditional cultivated landscape"—if I may apply such an all-embracing definition—an ideal we all have at the back of our minds. It is a very significant image: discussions of the achievements of agriculture cannot be limited to yields, the land used for farming or the way in which it is used, nor to ecological benefits or mistakes, but must also extend to the effects of farming on people, especially those not active in the sector—who are very much in the majority of today's Europe. These people expect food-producing areas to be part of a varied landscape with different features, including wild flowers round the edges of fields, flower-studded meadows, butterflies and lark-song. In other words, they picture the traditional cultivated landscape, an image which is already part of history in many areas, living on only in songs, stories and pictorial art.

Farmers like to regard themselves as the creators and caretakers of the landscape, responsible for the shaping and maintenance of our natural environment as well as their essential task of using carefully selected plants and animals to produce food for mankind.

However industrialisation, the increasing availability of technology and chemicals and the spread of knowledge about genetics, etc., have led to developments which no longer have much to do with the ecological idea of the countryside.

The aim of producing food is increasingly coming to the fore, to the exclusion of everything else. As one of mankind's fundamental needs is thereby satisfied, great economic value is attached to food production, which is also of considerable ecological significance, as it can only be successful if the environment's natural systems are interfered with or altered to a greater or lesser extent. The types of agricultural use to which land is put are increasingly determining the development of large areas of the countryside, either taking advantage of natural trends or suppressing and overriding them through the use of externally controlled "systems". Hence the farmer has almost inevitably become responsible for shaping the landscape and the environment. However, farmers' efforts may result in either:
— the care and maintenance of both the natural and cultivated landscape; or
— deterioration of the natural landscape and pollution of the environment.

(Photo H. Austoos)

Nevertheless, it must be pointed out that this is not a condemnation of farmers. The farmer's economic raison d'être is food production, so farmers who wish to survive have to accept certain economic constraints, namely the need to cover the costs of production and to earn an adequate income. As income standards are now almost exclusively set in the non-agricultural sector, and since the prices of farm produce include no—or an insufficient—reward for farmers' ecological duties, agriculture has begun to suffer from a lack of economic competitiveness. Farmers are therefore obliged to expand production, at the expense of the balance of nature, to the point at which they are positively exploiting the land.

The effects of intensification

The prevailing economic conditions follow industry's example and intensify their efforts, and current agricultural policy encourages them to do so.

To illustrate what is happening, a few facts about developments in the farming sector, especially in central Europe, are given below:
— There is a tendency over wide areas of our continent for arable and stock farming to go their separate ways, i.e. more and more farms are specialising in quite specific types of production. This gives rise to previously unknown problems such as unwanted waste products, examples being straw in areas where only cereals are grown and silo residues or liquid manure where stock-breeding is the speciality.

The situation in the German Democratic Republic should be noted in passing; here stock and arable farming have already become decoupled to such an extent that consideration is being given to the possibility of using a pipeline to transfer the liquid manure produced in the stock-breeding areas of the Thuringian mountains to the arable farming areas of the north German lowland plain (Brandenburg, Mecklenburg and Pomerania).
— Crop rotations are in rapid decline, so the variety of products is now smaller. Among the consequences are a lack of balance in the uses to which the soil is put, a tendency to erosion after harvest, etc.
— The average size of farms is growing, in some regions faster than others, and fields are therefore getting larger and larger; hence a further reduction in the amount of natural landscape.
— The soil is being worked even more intensively thanks to the greater use of technology and chemicals.

Soil erosion

Some of the resulting problems have been familiar for quite a long time now and cause trouble to the farming community itself. An example is soil erosion in intensively farmed areas, such as Austria's *Marchfeld*. Among the reasons for this erosion, which is sometimes very severe, are:
— the natural vegetation cover has been removed, to the point at which the soil is virtually bare and level;
— the watercourses important to such an arid region as the *Marchfeld* have been improved and completely regulated;
— the extensive cultivation of few species means that there are occasions, such as after harvest or ploughing, when large areas without any protective vegetation are exposed to strong winds;
— frequent strong winds cause extensive soil loss in places, due to the lack of woodlands and hedges and the fact that the soil has dried out and been destabilised (due to the use of agro-chemicals, stubble-burning, etc.).

The Council of Environment Experts set up by the Federal German Government produced a well-substantiated special report on the results of its survey, "*Umweltprobleme*" (environmental problems) early in 1985; this states, at item 570(4):

"Any cultivation of the soil which involves removing the protective plant cover may lead to erosion by wind or water and a loss of agricultural soil, with undesired deposits of soil or eutrophication nearby, especially in watercourses. This disruption of the balance of nature is even greater if uniform agricultural ecosystems receive the same treatment over wide areas. The greater the area in which fertilisers and pesticides are applied, the more detrimental such applications are to the balance of nature (Author's note: e.g to the groundwater complex) as greater quantities are used on each occasion. Similarly, the amount of soil erosion is proportionate to the size of the area under cultivation. Hence the larger the fields, the greater the danger to the natural balance."

The influence of types and methods of agricultural production on the structure of the countryside differs greatly from region to region, of course. The *Marchfeld* area quoted as an example is definitely one of the agricultural areas of Austria which are under the greatest pressure.

However, this fact and the continued existence in Austria of large areas where it is hardly possible to detect any pressure from agricultural activities on the balance of nature do not justify a failure to study the ecological situation in these areas, too, and above all to take it into account when planning agricultural operations.

My grounds for saying this are:
1. The complexity and intricacy of the ecosystems, groups of ecosystems and, ultimately, the whole balance of nature in a largish area mean that, for the present at least, it is hardly possible to foresee the direct or indirect effects of any intervention. Science is not sufficiently advanced. In short, only superficial research has so far been done into the effects of farming on the balance of nature. One reason for this is that the "ecology of the countryside" has only recently become an established science, with comprehensive, inter-disciplinary working methods, while another is that farming practice had not become oriented towards technology, chemicals and rationalisation until recent decades.
2. It must be emphasised that farming is only one aspect of the complex concept I shall refer to as "pressure on the environment". Agriculture has a fixed place in a system of land use in which pressures of various types and degrees of intensity have an effect on the balance of nature and, in many cases, on other uses too. It is quite possible that this will lead to an accumulation of pressures which (as already stated) we cannot yet fully assess.

(Photo G. Lacoumette)

In the past...

(Photo H. Austoos)

... Today

Some indications of degradation

Even areas where current agricultural uses are not apparently putting major pressures on, or eliminating, aspects of nature may in some circumstances be the points at which the effects of another kind of pressure start to make themselves felt. The example below is intended to clarify this rather complicated idea:

The vitality of a given ecosystem is reduced by nearby agricultural activities, although there is no visible damage. The slightly weakened ecosystem is more vulnerable to other influences (e.g. air pollution) than similar unimpaired ecosystems.

Modern forms of farming impose pressure on the environment in numerous ways. The pressure is usually felt over a very wide area, rather than at specific points, and must therefore be taken all the more seriously.

Below are some examples and brief explanations:
— **Groundwater is at risk** from penetration by nitrates, and sometimes by other substances. Surplus nitrates, i.e. those not required by plants, are not absorbed by the soil, and seeping water carries them into the groundwater.
— **The soil is at risk.** The danger of soil erosion by wind and water has already been mentioned. Soil is lost not only from the fields which are periodically bare (after ploughing), but also from those where crops are grown in rows (e.g. maize, potatoes and beet) and herbicides used to keep the rows clear. Surveys and measurements have shown that when 1 mm of soil is eroded, the loss per hectare is approximately 15 tonnes of soil, with all its nutrients.

Soil structure deteriorates as the soil is periodically intensively cultivated and then loosened and compacted by heavy farm machinery. Further factors are the reduction in crop rotations and the abandonment of varieties with deep roots. Another significant element is soil pollution by foreign substances, as this may sometimes lead to a change in soil chemistry and in the soil's ability to act as a filter and a buffer. However, further extensive research under this heading will be necessary.
— **Damage to surface watercourses.** When small watercourses are piped in, or at least "regulated", their biological ability to purify themselves is impaired. Nor are they of any further use as biotopes. Their nutrient content rises because of pollution (whether direct or indirect) from adjacent farmland, combined with the washing of soil into them; the growth of weeds and algae and the consequent lack of oxygen may disrupt the ecological balance of the water. However, the most serious effect of modern farming is definitely the **risk to habitats** (biotopes) and hence to species of plants and animals.

Alongside "visible events", the best indication of the disappearance of natural elements of the countryside is the decline of plant and animal species. Only when biologists began to draw up "Red Lists" of endangered species did the alarming extent of pressures on the environment and of changes which have occurred start to become clear.

A count of native animals taken in Austria revealed an alarming decline in some species and danger to others. The survey covered the following totals of the 30,000 native species of animals:
— 409 vertebrates;
— approximately 9,550 species of insects; and,
— approximately 150 other species.

It was discussed that:
— 114 of these species had disappeared without trace;
— 340 were threatened with extinction; and
— 2,200 in all were currently at risk.

The following are the figures for animals at severe risk within each category:
— amphibians: 100%;
— reptiles: 92.3%;
— fish: 58.3%; and
— birds: 55.3%.

A series of factors, the most important of which by far is the influence of farming, is responsible for the appalling decline in these species, according to Prof. Sukop's study ("*Veränderungen der Fauna und Flora*", 1981, included in a special issue — *Sonderheft* 197 — of "*Berichte über Landwirtschaft*").

He says that 397 out of a total of 581 species are in acute danger because of the various types of land use and production practised by farmers. The main causes of the decline in the number of species and of the impoverishment of biotopes are:
— the diminishing size, fragmenting and elimination of natural biotopes;
— the devaluation of natural biotopes through changes in their water and nutrient content;
— modern grassland management;
— intensification of land use by farmers.

This brief survey has given a very rough idea of the effects of farming on the landscape, the balance of nature and the soil.

But what is to happen next? If we are to believe the relevant scientific findings—and we certainly ought to do so—we are already involved in a race against time, in many areas of our countries at least. The declining health of the soil and increasing soil erosion are just alarming as the decreasing variety of landscapes—both from the aesthetic and the biological points of view.

Possible solutions are being put forward in large numbers and from the greatest variety of quarters. These could be applied to good effect, but only if action is taken as rapidly as possible: i.e. here and now. ■

O. Prof. Dipl.-Ing Hermann Schacht
Institut für Landschaftsgestaltung und Gartenbau an der Universität für Bodenkultur
Peter Jordan-Strasse 82
A - 1190 Vienna

The enormous richness of salt marshes

Jean-Paul Hetier
Jean-Noël Lheritier
Didier Moulis

Once intensively used transitional environments

Salt marshes, as areas of transition from sea and lagoon water influences to terrestrial environments, have the peculiarity of being man-made.

Their high biological potential explains former human intervention aimed at transforming them into farmland despite very powerful constraints. Remodelling of the landscape and installation of irrigation and drainage networks made it possible to establish crops, vineyards and hay meadows which subsequently had to be protected with dykes against the sea and flooding.

Now virtually abandoned, they are used for extensive grazing and for hunting, and no longer benefit from the careful management which they once enjoyed.

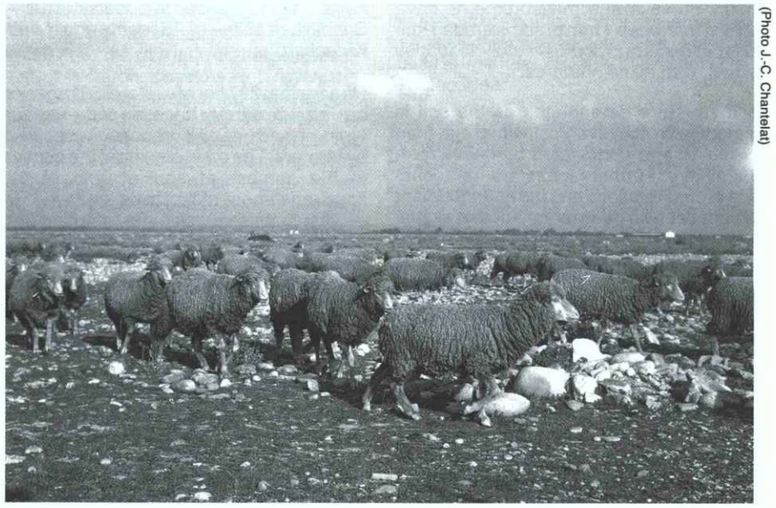
Their ecology is now determined by two essential factors: water and salt; owing to their relative flatness, not only the vegetation but also the animal populations are directly dependent on the water level and its variations (alternate periods of submersion and dryness), and salinity (upward diffusion of salt from saline groundwater at varying depths).

Ecologically rich environments

Fluctuations in salinity and submersion represent the ecological constraints limiting the number of plant species which succeed in colonising salt marshes, so that almost homogenous plant populations are not uncommon, for instance flats grown with *Salicornia fruticosum* or rush beds of *Juncus acutus*.

Yet the juxtaposition of environments with differing seasonal characteristics of salinity and submersion, the influence of bygone development, different management patterns and high biological productivity potential are factors which create a landscape comprising a wide variety of animal habitats. This explains the diversity and originality of typical salt marsh wildlife.

Animal life is indeed highly original and varies with the seasons, as is amply illustrated by the bird life:
— among the very few springtime nesting birds in these areas, there are several remarkable species such as the black-winged stilt;
— in autumn and early spring when the ground is softened or slightly submerged by rainwater, salt marshes harbour large populations of limicolous birds (godwits and sandpipers) and flamingoes and provide them with a plentiful food supply;
— in winter they serve as daytime coverts for many species of duck.



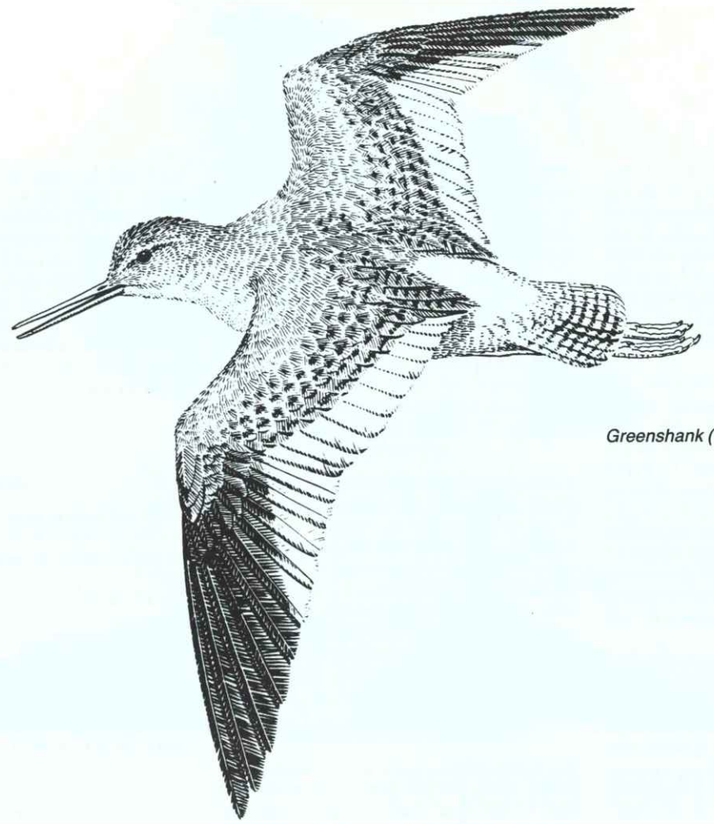
(Photo J.-C. Chantelat)

Regular flooding, however, means that certain land animals, rodents and reptiles for instance, are not constantly present. On the other hand, the flood periods result in exceptional biological productivity (phyto- and zooplankton, molluscs, crustaceans, worms and Diptera) which explains the presence of large bird populations.

Man-made alterations can have a variety of impacts on fauna; harmful where they result in over-salination or permanent dryness but beneficial where they introduce certain diversified landscape features (banks wooded with tamarisks, ditches, etc.).

Fragile environments in need of management

Man's alteration of hydrological conditions can have a strong indirect effect in aggravating the deterioration of these areas or assisting their biological recovery. Thorough ecological research prior to any intervention in these particularly fragile environments is therefore imperative.



Greenshank (Tringa nebularia) (Drawing NCC)

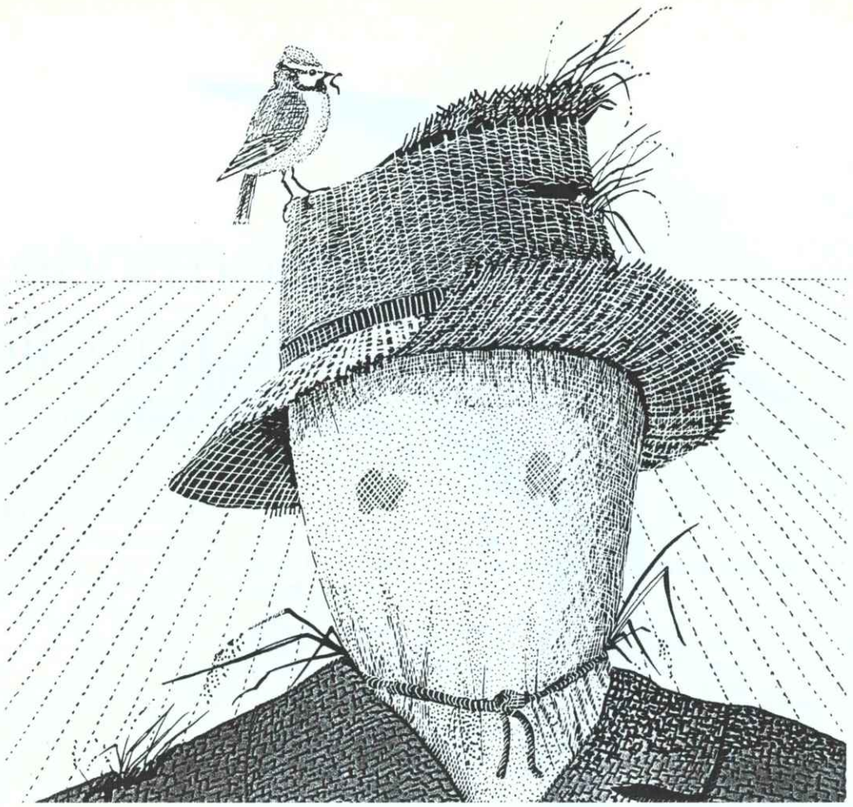
Their wealth of diversified wildlife makes salt marshes keypoints of conflict between hunting, which is widespread in Mediterranean France, and other uses for these nature areas (breeding of horses and bulls, walking, discovering nature). In these circumstances, planners and especially politicians are increasingly confronted with the need for protection and then management of these sites.

The measures taken by the municipality of Lattes (Hérault) are exemplary in this respect. Compelled by imminent urban pressure from the Montpellier conurbation (population 400,000) only 10 km away to implement an active policy for the protection of salt marshes and wetlands by the shores of the Méjean lagoon, it applied successfully to the Conservancy for Coastal Areas and Lake Shores whose purpose is to buy up coastal areas threatened by urbanisation and organise their protection.

On the basis of a thorough ecological appraisal by the Regional Planning and Environment Institute, the Lattes municipality and the Conservancy were then able to stimulate a wide-ranging discussion among all parties using or operating on the site, viz hunters, stock-farmers, ramblers and mosquito extermination services.

Thanks to this consultation, a "charter" governing the use and management of the northern shores of the Méjean lagoon was drawn up; it is based on control of water levels in order to preserve the various habitats and the wildlife diversity, ease the hunting pressure, reserve certain periods for educational work and rambling, and prohibit vehicular traffic. Various development projects for the implementation of the charter were then carried out, including nature trails, wildlife observation points and repairs to the drainage network for control of submersion and salinity. ■

Jean-Paul Hetier
Jean-Noël Lheritier
Didier Moulis
Ecologues, chargés de mission
IARE
Domaine de Lavalette
Avenue du Val de Montferrand
F - 34100 Montpellier



Drawing RSPB

Alternative crops

Michael Swan

Perhaps the hottest topic for discussion between British farmers today is what to do about falling farm prices. Most of the commodities produced on Europe's farms are now in surplus, with increased efficiency of production only adding to the problem, and support prices bound to fall. This is ironic when for the last 40 years farmers have been encouraged to improve their productivity by removing hedges, rough banks, spinneys, pit holes and so many other features of the lowland landscape, and adding ever increasing amounts of fertiliser and pesticide.

Measures to help farmers are needed

Meanwhile, conservationists have been increasingly alarmed about the effect of all this "rationalisation" and intensification on Europe's hard pressed wildlife. With increasing understanding and documentation of what has happened, it now becomes clear that fresh initiatives are needed to help farmers into new ventures which are financially attractive but which at the very least do not add further pressure to dwindling wildlife, and which preferably actually improve conservation values.

The most obvious suggestion to help with the problem of surplus is to take land out of agricultural production, but this means that loss of income for the farmer is inevitable. Many of the costs which he faces are fixed, no matter how efficiently he farms, so that taking a small percentage of land out of use will remove a large proportion of his profit and he will naturally look to those who suggest this plan for financial help.

Even if compensation was available, leaving land fallow is not attractive from the agricultural point of view, since it is almost bound to provide a haven for some form of weed, pest or disease, while the conservation value is likely to be minimal. A much better plan is to manage the land actively for conservation or other alternative uses.

One frequent suggestion for farm diversification is to convert surplus buildings to alternative uses, whether it be as holiday cottages, for craft industries, or as visitor centres. While this may generate additional and welcome income, such schemes rarely take land out of production, unless some form of farm nature trail, fishing, or other tourist attractions can be planned alongside the main project to make it more attractive.

Shooting as a source of income

With more of the population having greatly increased leisure time, and with easier motorway access to the remoter countryside, there is increased demand for many sporting activities, of which game shooting is just one, and one in which older age groups can participate. It is also one which can provide a very significant income, as well as diverting land into uses of high conservation value.

A simple example of the money involved can be given from the current sporting values of land in the southern part of the United Kingdom, where the right to shoot usually belongs to the landowner. A 500 hectare block of good agricultural land, with no hedges, spinneys, ponds or woods might with difficulty attract a shooting tenant. Such an unattractive landscape with a low potential for game and wildlife would not provide much shooting, even with reared and released birds and a rental of £ 1.00 per hectare per year would be as high as one could expect. So, a "food factory farm" such as this *might* produce a sporting income of £ 500 per year. But take the same area and add 10 hectares of good well distributed game habitat, and the story becomes very different. For example seven or eight kilometres of well maintained hedges and banks, totalling a couple of hectares, together with seven good mixed but mainly broadleaved woods of one hectare could, if well sited, provide the basis of an interesting pheasant and partridge shoot. If the tenth hectare took the form of a couple of small ponds, then wildfowl could be added to the "menu".

A farm with such potential could easily attract an annual rental of £ 5.00 and as much as £ 10.00 per hectare if it included natural features such as hills and valleys and was accessible to a population centre. Thus, the financial implications of taking 10 hectares out of agriculture would be to provide a rental income at £ 7.50 per hectare over the whole farm of £ 3,750. Allowing for the maximum of £ 500 which even the "food factory" might provide, each of the non-productive hectares can be seen to have generated an extra income of £ 325. This, of course, does not compare with the gross income produced by 8 tonnes of wheat per hectare, but once it is established there are no annual inputs. Also, for maximum sporting value, game coverts and spinneys are likely to be sited at the edges of hills, or on sloping ground which is inherently less likely to be the most productive agriculture land.

Forestry production

There could easily be other production from these essentially game habitats too. In the ponds there might well be possibilities of incorporating sporting fishing or crayfish production alongside the wildfowl. Small woodlands planted with game in mind may not be the most productive for forestry, but there is no reason why they should not provide some profitable timber. Because game and wildlife need shelter from shrubs and bushes, and open sunning areas or glades, it is likely that between 10 % and 25 % of the total area in these small spinneys will produce no timber, but the rest can be devoted to normal forestry operations. The hedges on the farm are less likely to produce a direct profit, but they do provide shelter to crops and stock, and may also help to reduce soil erosion. Both these factors could well go some way to off-setting the value of the land they occupy.

The original establishment of woods, hedges and ponds is not, of course, without cost. Fortunately however, restoration of some of the damage done in the past is now considered an important national policy in the U.K., and various forms of assistance have been available for some time. Until recently this has simply been in relation to establishment costs, but in the last few months Great Britain's Ministry of Agriculture (MAFF) announced its intention to grant aid to some farmers who take some land out of production with an annual payment in lieu of lost income.

Bearing in mind the alarming rate at which the world's tropical rain forests are being destroyed, it must be sound policy for all European governments to encourage home production of hardwood timber. Great Britain's Forestry Commission Broadleaved Woodlands Scheme, along with the new MAFF proposals, must therefore be seen as a very encouraging step in the right direction.

Other measures are necessary

The Game Conservancy feels, however, that there is scope for an even better approach by giving game and wildlife conservation greater consideration. The present grant aid proposals do not really offer a high enough financial incentive to influence the intensive farmer to change his current practices. However, a combination of the sporting values already mentioned and some increase and changes in the grants at present available or proposed could well be sufficient to divert some land out of agriculture. For example, a change from the present proposal to provide grant aid only for the establishment of trees, so that assistance is also available to help in the cost of establishing shrubs and hedges, is almost essential.

For maximum game and wildlife value, woods should have a thick low hedge around the outside, with open glades and shrub cover within. Also, in the first few years of establishment, hardwood trees provide very little shelter. It is therefore much better to incorporate small groups of softwoods for early shelter and as a "nurse" for the broadleaves. These can then be progressively thinned and removed to leave a predominantly broadleaved woodland in the long term.

Leaving wide rides, with curves in them and shelter from the wind, not only makes access easier, but provides places to stand when shooting driven pheasants. The rides also provide browsing places for deer which have to be managed and which can, by providing stalking and venison, provide a further source of income.

The Game Conservancy has for some years now been pioneering the planting of woods for game and wildlife. Its "Instant Spinney" technique of establishing a wood by planting trees, each with one of the new tree

Woods: shelter for game, but also a source of income for the farmer

(Photo G. Lacoumette)

(Photo G. Lacoumette)

A well-kept landscape has many advantages

guards, at wide spacing, is proving highly successful. With the trees planted in rows which are far enough apart to allow cultivation between them, it is possible to establish an annual game crop, such as kale, in the spaces created. In this way, a long-term woodland planting has value in its very first year from the shooting point of view.

It is important to remember, however, that for maximum game and wildlife value, as well as to reduce agricultural surpluses, such plantings should be on lowland areas. With careful management, Britain's superb heather uplands are already producing a viable mixed crop of red grouse, deer and sheep. Recently grouse populations have decreased in many areas due to predation and other factors. When management for shooting is no longer viable, the only alternatives are sheep and forestry. Grouse moor management is harshly treated by taxation compared with sheep and forestry, both of which are subsidised. Ironically, if conifer forest replaces the grouse/sheep mix, more lowland will be left unplanted and sheep are likely to be moved to lowland areas, probably producing another surplus crop. Grouse are therefore already a useful alternative crop helping to keep down surplus production while maintaining a highly attractive landscape producing income from tourism as well as shooting.

A new project

In a rather different aspect of its research, The Game Conservancy has recently been investigating another area which may help to improve lowland conservation and reduce agricultural output. This is through the work of the Cereals and Gamebirds Research Project on the technique of conservation headlands.

The basic principle is to avoid spraying the peripheral six metres of cereal fields with insecticides and broadleaved or residual herbicides, although certain specific chemicals are allowed to control particular pernicious weeds. In this way insect populations in this area of the crop are much increased. This applies especially to those species which live on broadleaved weeds rather than the cereal crop itself. Research at The Game Conservancy has shown that it is just this particular group of insects which also plays a role in keeping down aphid populations, which is so important to gamebird populations. This is because both pheasants and partridge chicks are reliant on insects for food during the first few weeks of their lives. By using the technique on an experimental basis on a number of farms around Britain, The Game Conservancy has been able to demonstrate very significant increases in average brood sizes of gamebirds, with some areas having a shootable surplus where none had existed for many years previously, and only marginal loss of agricultural profit and yield. The system is still being developed but in the next few years it should be possible to recommend a management package of options. It could then become worthwhile for farmers to upgrade both their habitat management and predation control in order to increase wild game, thus stimulating the planting of new hedges and woods, with all the broader conservation values which these generate.

That the benefits of developing some shooting potential are real is shown by the fact that despite falling land values, farms in England with suitable habitat for game and shooting seem to be keeping their value well. Indeed, one of the leading land agents has said that when such holdings come on the market in the southern counties, they can command a premium of £ 500 to £ 700 per hectare and partly because they are usually also visually much more attractive, are much easier to sell.

Thus, while game conservation will, in the right situation, probably never be a full answer to over production of basic foods, there is no doubt that it can provide replacement income and a viable alternative form of land use. At the same time it will have a broad conservation value which is there for all to enjoy, both now and in the future.

Michael Swan
The Game Conservancy
GB - Fordingbridge SP6 1EF

(Photo H. Ausloos)

Weeds: better crop rotation, less use of biocides and hedge-replanting is needed

At the Council of Europe

The European Ministerial Conference on the Environment, in Lisbon

The 5th European Ministerial Conference on the Environment (Lisbon, 11-12 June 1987) adopted several resolutions:

The first, **on the protection and management of the natural heritage in rural areas**, recommends that governments manage rural areas in accordance with the principles below:

— protection of the natural heritage
The aim should be to ensure that ecological processes work smoothly, thereby maintaining nature's biological variety;

— agricultural and forestry policies
Farm and forestry practices which are sympathetic to the environment should be strongly encouraged, as should farm practices which are more geared to biological control;

— research
Adequate financial means and staff should be allocated to research, with a view to working out and applying methods which reconcile the interests of farming and forestry with those of conservation. Research should particularly foster the use of environment-friendly methods (such as biological farming);

— tourism
Tourism policies should accommodate the need to conserve rural sites, landscapes, biotopes, woodlands and crops, and encourage "rural" tourism (farm holidays);

— craft activities and light industry
Employment opportunities in crafts and light industry should be safeguarded;

— energy
The aim should be rational use of energy and the greatest possible reduction of future energy requirements;

— transport, communication routes and housing
Environmental aspects should be taken into account when decisions about transport and routes are taken.

The Ministers expressed their great concern about the damage—especially qualitative—suffered by the soil; they instructed the Council of Europe to consider whether it would be possible to draw up a convention on soil protection.

Resolution No. 2, **on European conservation strategy**, recommends that a European conservation strategy based on the following principle be drawn up: it is essential that mankind have a healthy, balanced and productive environment which maintains ecological processes and representative ecosystems, preserves the diversity of genetic resources and ensures the long-term use of species and their ecosystems. The European strategy should focus on "prevention, rather than cure", as long-term preventive action is usually more cost-effective than dealing with problems as and when they arise. The "polluter pays" principle should be fully applied and extended to all types of damage done to the environment. ■

National Agencies of the Centre

AUSTRIA
Mr Peter SONNEWEND-WESSENBERG
Österreichische Gesellschaft
für Natur- und Umweltschutz
Holzgasse 2a
A-6020 INNSBRUCK

BELGIUM
M. Jean RENAULT
Ministère de l'Agriculture
Administration
de la Recherche Agronomique
Manhattan Center 7e étage
Avenue du Boulevard 21
B-1210 BRUXELLES

CYPRUS
Nature Conservation Service
Ministry of Agriculture and
Natural Resources
Forest Department
CY-NICOSIA

DENMARK
Miss Lotte BARFOD
National Agency for the
Protection of Nature,
Monuments and Sites
Ministry of the Environment
13 Amaliegade
DK-1256 COPENHAGEN K

FRANCE
Mlle Isabelle RAYNAUD
Direction de la Protection
de la Nature
Ministère de l'Environnement
14, boulevard du Général-Leclerc
F-92524 NEUILLY-SUR-SEINE
CEDEX

FEDERAL REPUBLIC OF GERMANY
Deutscher Naturschutzring
Bundesverband für Umweltschutz
Kalkuhlstraße 24
Postfach 32 02 10
D-5300 BONN-OBERKASSEL 3

GREECE
M. Byron ANTIPAS
Secrétaire général
Société hellénique pour la
protection de la nature
24, rue Nikis
GR-10557 ATHENES

ICELAND
Mr Gisli GISLASON
Director
Nature Conservation Council
Hverfisgötu 26
ISL-101 REYKJAVIK

IRELAND
Mr Tommy O'SHAUGHNESSY
Department of Tourism, Fisheries and Forestry
Forest & Wildlife Service
Leeson Lane
IRL - DUBLIN 2

ITALY
Dr ssa Elena MAMMONE
Ministero dell' Agricoltura
Ufficio delle Relazioni internazionali
18, via XX Settembre
I - 00187 ROMA

LIECHTENSTEIN
Ing. Mario F. BROGGI
Liecht. Gesellschaft
für Umweltschutz
Heiligkreuz 52
FL - 9490 VADUZ

LUXEMBOURG
M. Charles ZIMMER
Ingénieur principal
des Eaux et Forêts
Ministère de l'Environnement
5A rue de Prague
L-LUXEMBOURG-VILLE

MALTA
Mr Joe SULTANA
Department of Environment
Ministry of Education and Environment
M-VALLETTA

THE NETHERLANDS
Mr Ing. P.M. DETHMERS
Department for Nature Conservation
Environmental Protection
and Wildlife Management
Postbus 20401
NL-2500 EK THE HAGUE

NORWAY
Mrs Irene SIGUENZA
Ministry of the Environment
Myntgaten 2
P.O. Box 8013
N-0030 OSLO

PORTUGAL
Prof. Luis SALDANHA
Liga para a Protecção da Natureza
Estrada do Calhariz de Benfica, No. 187
P-1500 LISBOA

SPAIN
M.D. Antonio MAGARIÑOS COMPAIRED
Dirección General de Medio Ambiente
Ministerio de Obras Públicas y
Urbanismo
Paseo de la Castellana nº 67
E-28071 MADRID

SWEDEN
Mr. Ingvar BINGMAN
National Swedish Environment
Protection Board
P.O. Box 1302
S-171 25 SOLNA

SWITZERLAND
Dr Ulrich HALDER
Ligue Suisse
pour la Protection de la Nature
Wartenbergstraße 22
Case postale 73
CH-4020 BÂLE

TURKEY
Mr Hasan ASMAZ
President of the Turkish Association
for the Conservation of Nature
and Natural Resources
Menekse sokak 29/4
Kizilay
TR-ANKARA

UNITED KINGDOM
Miss Shirley PENNY
Chief Librarian
Nature Conservancy Council
Northminster House
GB-PETERBOROUGH PE1 1UA

(Photo H. Ausloos)

Pheasant

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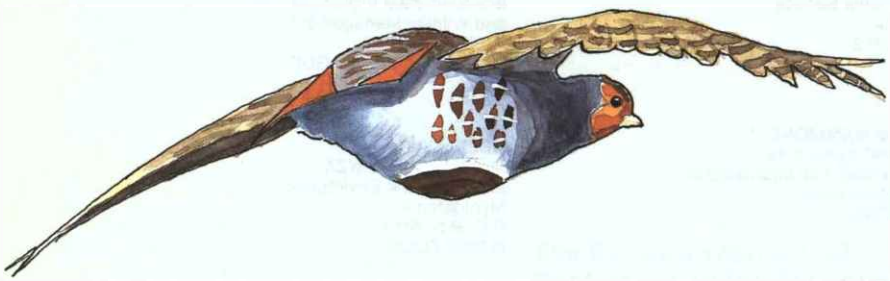

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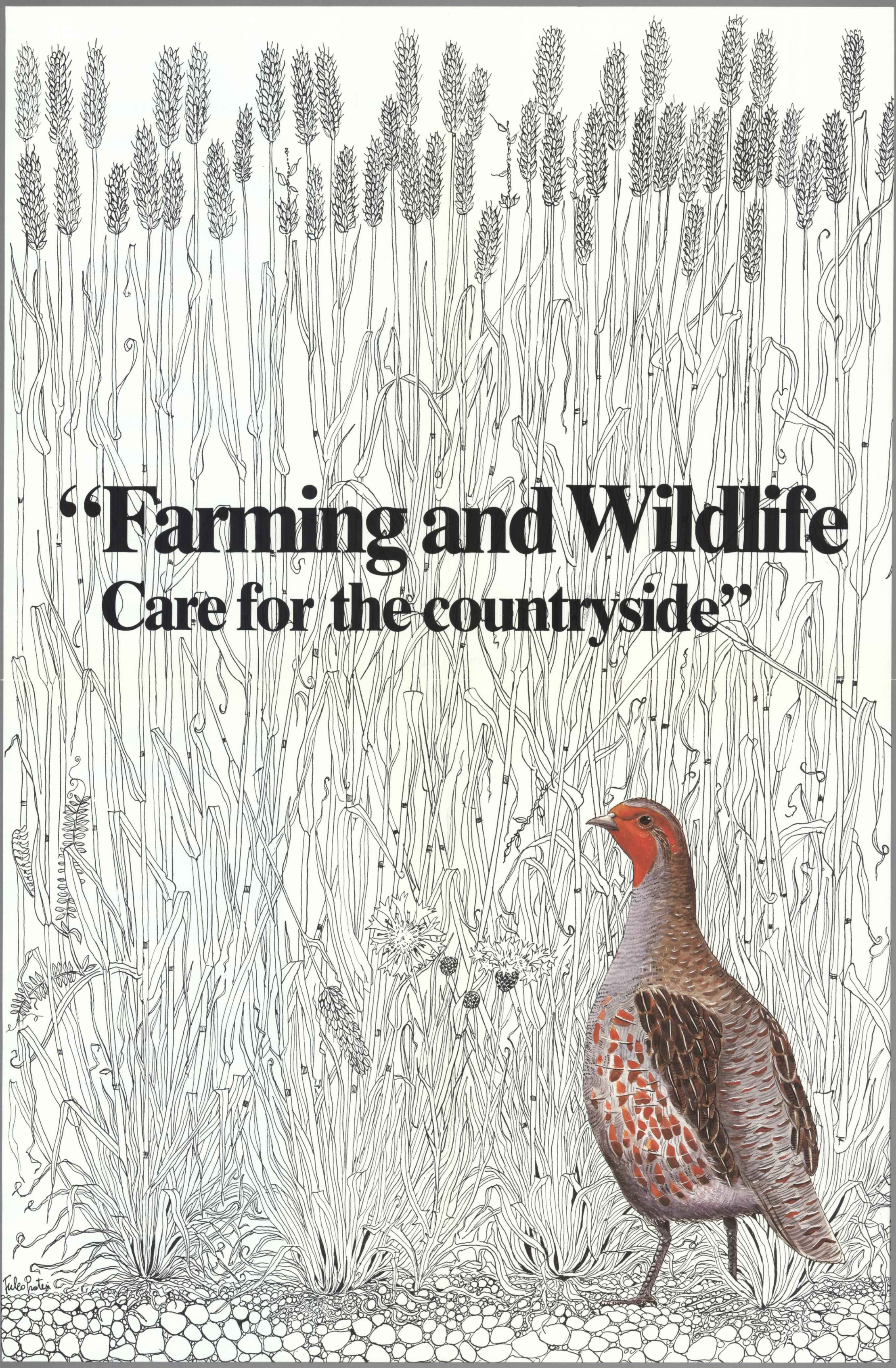

"Farming and Wildlife
Care for the countryside"

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