

NATURE IN FOCUS

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COUNCIL OF EUROPE

EUROPE'S CHANGING LANDSCAPES . 2



NATURE IN FOCUS

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EDITORIAL



JEAN-PIERRE RIBAUT

Head of the Environment and Natural Resources Division, Council of Europe

L'Impartial la Chaux-de-Fonds

Every citizen can see that, in his country, county or village, the problems of the conservation and management of the natural environment have suddenly reached such a size that the various responsible authorities are now unable to solve them satisfactorily. Consequently antipollution or physical planning measures are taken generally according to the acuteness of the immediate problems, instead of being integrated into a properly developed policy.

But to resolve problems on a day to day basis cannot make for a valid policy. It is absolutely necessary to bring all the conditions into consideration in order to find the long term solutions and to treat the totality of the questions as an integrated and global whole. In this new view the three following aspects form an integral part of this whole:

- the physical aspects; covering especially the various nuisances: air and water pollution, the growing poisoning of the soil by chemical fertilisers and pesticides, the harmful effects of these products on life in general and man in particular, deforestation and soil erosion;
- socio-economic aspects; these essentially affect the standard of living of the individual: the chance to find a home, to enjoy refreshing sleep, to benefit from leisure zones and adequate means of communication;
- cultural aspects; among these it is convenient to list above all the aesthetic values of the biosphere: landscapes, natural monuments and sites in general, but equally the remarkable landscapes created by man.

Of these three components it is incontestably the first which attracts most attention. People are at least becoming aware of the second, but the third remains the poor relation. But this last will gain an increasing importance, the aesthetic quality of the environment playing a role in man's mental make up which has, until now, been underestimated.

It is not ecologists alone who can bring solutions to all these problems. Teamwork is necessary, between geogra-

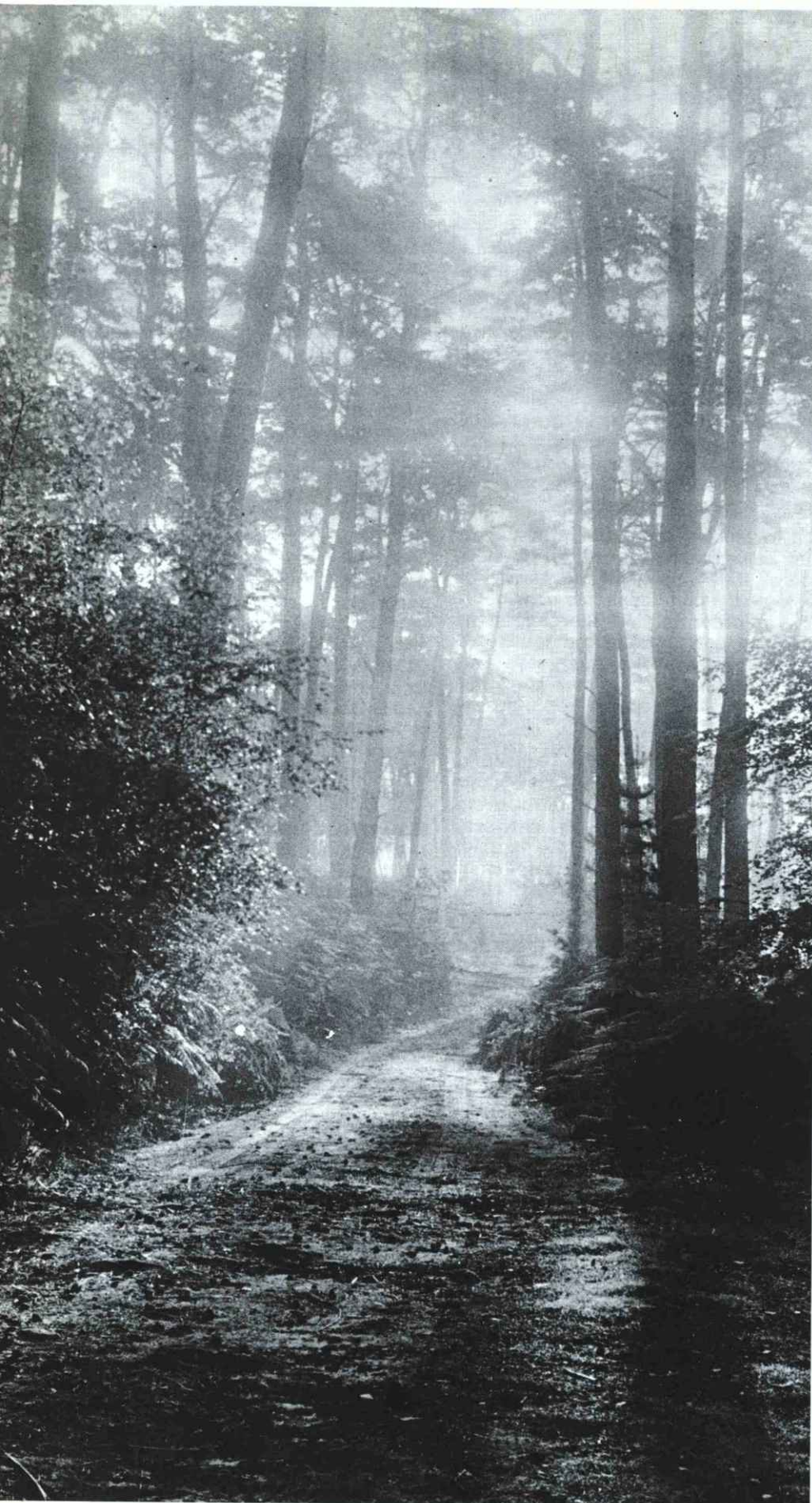
phers, economists, sociologists, doctors, priests, etc. It is only a team of this kind which can discover the best solutions for society, and make them acceptable even when they contravene particular interests, as is inevitable.

The setting up of such interdisciplinary teams, in which local and national governments evidently must play an important role, will allow, among other things, a better application of legislative and administrative decisions. This is especially true for the protection of landscapes, where laws are certainly indispensable to preserve that which remains, but are not capable on their own to control man's recent attacks on his natural environment. That depends essentially upon all civil engineers, landscape architects, town-planners, etc. On the other hand, the association of the industrial environment with these multidisciplinary teams allows a better integration of scientific and technological research in a political whole.

European Conservation Year was remarkable in the way it aroused the whole of public opinion in Europe. This new awareness must now gain in depth to pass from the stage of a mere awakening to that of concerted and effective action. The dialogue, the cooperation between all categories of people concerned must be intensified. We must not forget that the dimension of the problem is such that the old saying 'united for strength' means more now than ever before.

This is why the Council of Europe is convinced that Nature in Focus should continue this dialogue between all those concerned with the environment.





A TRUE HUNTER

loves and respects nature and his game and he will care for it. In our days, however, when hunting too has been influenced by the disturbing effects of the rapid change and development on almost every level of our society, many people now carry hunting arms who will never be hunters. It is often due to the acts of those for whom hunting has no deeper meaning than shallow amusement, the adoption of an imaginary status, or the search for superficial excitement, that hunting does not enjoy much goodwill. The tragic and unnecessary communication gap that existed between hunters and nature conservationists may be largely explained because of this. It is to help bridge the last of this gap and to enlighten the public at large that four eminent personalities were asked to contribute the series of articles in this issue of Nature in Focus on the meaning of hunting in our time: the President of the International Hunting Council, Dr IG van Maasdijk; naturalist Peter Scott, renowned for his efforts to save the world's wildlife through the World Wildlife Fund and other means; Professor Nüsslein, former director of the Institute of Hunting Science of the University of Göttingen and author of books which every hunter should have on his shelves; and Professor Bannikov, the leading game scientist and ecologist of the world's largest country, the Soviet Union. This series is also dedicated to the important congress 'Man and Nature' that was held during the World Hunting Exhibition at Budapest in September.

Game animals and game birds are one of the most beautiful of natural resources. But it is many years since game served only as a means of providing food and shelter (as it still does in a few remote corners of our world). Nowadays game has acquired new economic, scientific, ethical and aesthetic values. Perhaps it is the ethical aspect which should weigh most heavily in our approach towards game and all other natural resources.

The hunter's role in this part of the wise management of the vulnerable natural resource that is our game, becomes more and more difficult in our crowded world as his responsibilities towards fellow-men, nature and himself grow greater and more complex.

HAYO H HOEKSTRA

Head of the European Information Centre for Nature Conservation

G. Hallo/Jacana

THE HUNTER'S RESPONSIBILITY



F. Hazelhoff

There can be no doubt that, since the Council of Europe organised last year's European Conservation Conference in Strasbourg as the international inauguration of European Conservation Year 1970, the conscience of public opinion about the maintenance of nature and wildlife has been widely alerted and even alarmed. No wonder, therefore, that long-standing controversies about the ancient sports of shooting and hunting have been enlivened again. Thus it seems useful, especially in view of the recent hunting—conservation conference and exhibition in Budapest, to bring forward some aspects of shooting and hunting in relation to the conservation of wildlife, which are not generally known and certainly not sufficiently realised by those who are interested in nature and its protection. As President of the International Hunting Council, I would like to start with a bold statement. If law-controlled

shooting and hunting were abolished, all wildlife and also nature as such, would suffer irreparable damage. Game, usually harmful to agriculture or forestry, and mostly excellent for consumption, would soon be exterminated by farmers or poachers. Unprofitable covers, carefully managed in the interests of game, would be cleared away, thereby also changing the landscape and destroying nesting places and hide-outs for all kinds of wildlife which do not figure in hunting or conservation laws. Vast territories owned or rented at great cost by sportsmen, would be deprived of gamewarden or gillie, with the result that all care and control of wildlife in general would come to a stop. For governments, even of the socialist republics, it would be far too costly to take over the heavy financial burdens nowadays carried by sportsmen. Today, far greater damage to game is done through loss of habitat, by tour-

ist traffic, poachers, zoos, or people who trade in trophies, than by sportsmen. Sportsmen under adequate shooting and conservation laws take only the 'harvest' of wildlife, without touching the 'capital' itself.

When using the words 'law-controlled shooting and hunting' we imply that in all countries game laws should exist and that these laws should be strictly enforced against infractions committed by sportsmen, poachers, collectors or anyone else. Such laws and controls have to be introduced in all countries where they do not yet exist, and be brought under the 'umbrella' of international conventions.

One such convention of this kind was drawn up last February in Ramsar (Iran) — the International Convention for the Conservation of Wetlands and Waterfowl, covering Europe, Asia and

This Bewick's swan may die of lead poisoning! While red deer (on previous page) exist in Europe largely thanks to conservation by hunters, it is not to the hunters' credit that, despite complete legal protection, a high percentage of swans carry lead shot.



Africa. It aims at conserving or improving all wetlands (lakes, marshes, estuaries, etc) important to waterfowl (see Nature in Focus No 9 Summer 1971 p 22).

Another international convention in preparation (though it will still be some time before its text is drafted) is in the hands of the Hunting Rationalisation Research Group of the International Wildfowl Research Bureau. The work of this Group stretches over Europe, including the Soviet Union, and will subsequently be extended over Asia and Africa. The first aim is to collect all available data about wildfowl productivity, their wintering places and migration routes; about the methods of shooting or capture and the numbers of birds shot annually. As soon as these data have been collected and compared, propositions will be made at an international level in order to rationalise the shooting of wildfowl in Europe, Asia and Africa in such a way that the conservation of all species is assured for the future. These initiatives, and many others, furthering the conservation of game, are fully supported by the International Hunting Council, which counts among its mainly sportsmen membership, many scientists and conservationists who have never shouldered a rifle or shot a gun in their life.

A tremendous amount of work will still have to be done to turn the tide of further deterioration of wildlife all over the world. This concerns migratory as well as sedentary game. North America (USA and Canada) has led the way with their bag limits (the amount of game to be shot per gun per day) based upon the amount of game as estimated by yearly counts. In several countries excellent game and conservation laws are working well enough, but in others hardly any laws exist and if they do, they are badly or not enforced at all. This has to change, and change soon, if we want wildlife, the creation nearest to mankind, to survive on our planet with the manifold demands of its constantly increasing population.

E. E. Jackson

Dr I G VAN MAASDIJK
President of the International Hunting Council

I HAVE SOLD MY GUNS

PETER SCOTT C. B. E., D. S. C., LL. D.

1st Vice President and Chairman, World Wildlife Fund

Man has killed other animals since the dawn of human existence - for food, for security, and for fun. When he developed the domestication of food animals he had a lesser requirement to kill for food, but a greater requirement to kill predatory animals because they threatened his domestic stock. He continued to kill for fun because of his deeply rooted hunting instinct.

In some parts of the world killing wild animals is still necessary for food. In most places wild fish are eaten. The control of large predators is still occasionally necessary for the protection of human beings, and domestic animals. Pests which compete with man for food supplies or otherwise interfere with his activities have to be controlled. Killing for enjoyment, however, though it is still a widespread human activity, is only necessary if it can be shown that the inhibition of the hunting instinct leads to psychological imbalance and frustration. It seems likely that hunting is no more 'necessary' than duelling or bear-baiting or bull-fighting or war. All living things must die. The only open questions are 'when' and 'how'. If an animal dies before it has replaced itself by successful breeding, and if too many of its kind share this fate, then the species will become extinct and many people believe that man should take pains to avoid causing the extinction of species, which in the recent past he has accelerated from the natural rate by a factor of about four. Species survival provides one answer to the question 'when?' Another might be, not before it has enjoyed a full life — for modern studies of animal behaviour suggest

that, in so far as any animal emotions can be equated with those of human beings, 'enjoyment of life' is probably an element in the consciousness of all higher animals. In nature few animals die of old age, and longevity records measured in captivity would be unlikely ever to be reached in the wild state. So the ideal answer to 'when' might be not too young and not too old.

What about the question 'how?' We cannot ever know definitively how much animals feel, though there is a great body of circumstantial evidence based on observation of their behaviour and on studies of their physiology. The primary feelings concerned are fear and pain, and perhaps also family altruism — loyalty to mate or young or community.

The degree of suffering of which animals are capable obviously varies from one group of animals to another. There is, for example, ample evidence that reptiles feel less pain from injury than mammals, and no doubt there is wide variation within the groups, thus suffering in lower mammals is likely to be of a lower order than in man. There is also a probability that animals lack much of the anticipatory apprehension which can increase human suffering from pain. 'I might die of this' is a human thought probably not shared by any other injured animal.

The answer, then, to the question 'how' must surely be 'with a minimum of pain and fear'.

Hunting in a paradise

From earliest times the hunting tradition has preserved natural environ-



Popperfoto

Diana and Actaeon epitomise the long history of hunting.

ment that would otherwise have been destroyed by man's other activities. 'Paradise' was originally a Persian word meaning 'hunting park', and many large areas have been set aside, many forests have remained uncut, many ecosystems have remained intact in the name of game preservation. In Western Europe for example many woodlands would not now exist but for pheasant shooting, and many more marshes would have disappeared but for duck shooting. For the same reasons, however, man has waged war on the predators, birds of prey in particular and has eliminated them from many areas. Even now too few game-keepers recognise the vital part played by predators in a healthy ecosystem. Eagles and hawks are still indiscriminately destroyed in far too many places, which is all the more unfortunate in view of the disastrous effects on them of toxic chemicals used in agriculture. But few species have been exterminated by sport hunting, though Stone Age Man in various parts of the world brought a good many species to extinction by hunting them for food, or in self defence. The rearing of native quarry species especially for hunting and the introduction of exotic quarry species have been represented as ways of reducing hunting pressure on wild native species. In the case of introduction the competition of the newly introduced species has often endangered the similar endemic forms. Yet introductions still go on and the attendant disasters still occur, all in the name of sport.

The artificial rearing of pheasants, quail, and waterfowl has also had some unfortunate side effects, though

in many cases the experiment has successfully boosted local populations. In some countries mass rearing has led to a type of shooting based on releasing birds individually from cages, which many people regard as the lowest form of field sport.

If asked their prime motivation for hunting I believe comparatively few sportsmen would answer 'to kill', or indeed even think of the killing as the main reason for going hunting. 'It's a lovely morning — let's go out and kill something'. I only once heard the phrase used in earnest, and even then it was perhaps as a quote more than as an expression of true motivation. In fact, of course, most people go hunting or shooting or fishing to be out in the open air, to get exercise, to practise a skill, and to be in the company of other like-minded people. The loneliness of marshes at dawn and dusk, the quiet beauty of the trout river, the crisp stillness of a frosty wood — these and the excitement of anticipation, the uncertainty of success and occasionally the attendant discomforts and dangers are of greater importance to the true sportsman than the actual kill. Yet without the kill — 'the ultimate sanction' — he would not be willing to go forth into the wild places. Or so at least the argument goes. But it is surprising how many people nowadays take a camera or binoculars instead of a gun. They do not seem to find that the kill is the only acceptable objective, nor that their instincts for violence and aggression can be sublimated only by killing.

A personal choice

For myself the 'moment of truth' came from a wounded wild goose. Several of the shooting party had shot at it, and it was evidently hit. It planed down and out onto the soft mud of the estuary. The place where it landed was an island in the middle of the river at a point famous for its quick-sands. The bird could be seen but not reached. Its legs were broken, it could not stand, but its head was up. There it remained for two whole days. By what right had I contributed to its suffering, and the suffering of countless other birds I had wounded in 20 years of wildfowl shooting? Yet during those years I knew well that a high proportion of all the shots I had fired had been neither kills nor misses. Somehow I had hardened my mind against the thought — blunted my sensitivity — because of the rough primeval pleasure of the chase, the romance of the wind and the rain, the

skill and knowledge required on the behaviour of the quarry, the effects of tide and moon, the handling of boats, and the handling of the gun. These in addition to the healthy outdoor exercise and the element of competitive skill pitted against fellow sportsmen seemed for all those years to justify that host of cowering wounded birds which had died slowly and in pain at my hands — until one day I saw that wild goose on the mudbank and nothing seemed to justify it.

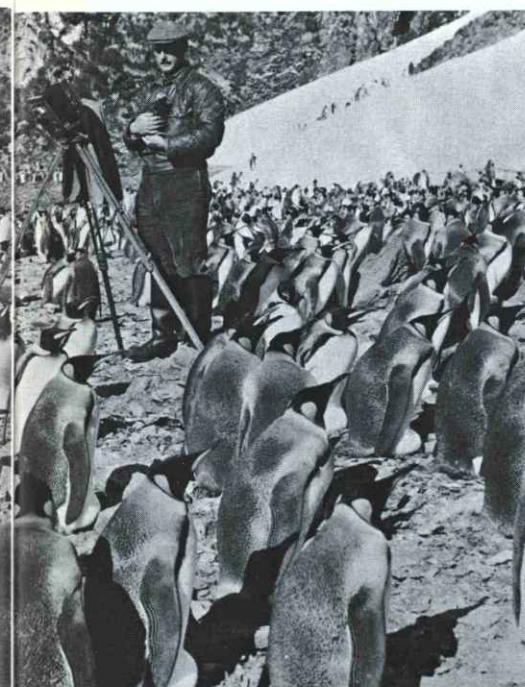
So I sold my guns, and have concentrated my interest on the living birds ever since. Now I wonder how I was able to look with equanimity on the little bloodstained corpses I had created, and concluded that I had somehow de-sensitised myself.

Perhaps I am not yet fully re-sensitised, for with conspicuous inconsistency I continue to find birds very good to eat. The consistent course would no doubt be to become a vegetarian but this I have not yet done.



Bavaria

▲ **Wildfowl, because of its habitat and migratory way of life is one of the most vulnerable species of game and has always fascinated Peter Scott. It was a wounded goose that made Scott decide to sell his guns.**



Niall Rankin

◀ **Change your gun for camera and binoculars! This picture shows the late Niall Rankin, one of the pioneer wildlife photographers in the 1920s.**

▼ **When poachers kill animals illegally, and often in the most brutal and cruel ways, they usually do so because there is a market for their products: and many European countries, among others, provide this market.**



Kenya Inform Serv/WWF

The decision I made after the wild goose incident is perhaps the sort of decision each individual hunter must make independently. Yet life must still be taken for good material reasons — even if it is not necessary to take it for fun — for food and to control pests. If humanity suddenly decided that no single bird or mammal would henceforth be killed the situation would be completely out of hand in a year or two, because species have evolved under human pressure, and the balances would be totally upset. Vegetarian man would find it even more necessary than he does today to control the animal species which reduce his food supplies and even to control the species which reduce their own food supplies by over population. So man would be back in the killing business again, but as a distasteful chore instead of an outdoor passtime, and so far as possible without the element of chance which is part of the definition of 'sport' and which has given the quarry species the label 'game'.

Thus the argument has sometimes been reduced to whether or not the hunter is killing as a job or for fun, and on that basis, as Prince Philip once pointed out, adultery would be all right provided it was not enjoyed. Again if all hunting sports were to be immediately abandoned great changes in the natural environment would quickly follow. The pheasant coverts would give way to agriculture, the woodlands would be cut down, the wetlands would be drained. Future generations may move away from hunting for fun, but if they do there will have to be a strong motivation for retaining the wild places in order to watch for fun, to photograph for fun, to study and to enjoy the living creatures without exercising the ultimate sanction.

There are all kinds of interacting motivations in each one of us, and many more again in every social community of human beings. If any consensus is to emerge I think it will be based on a wider reverence for life than most human cultures adopt at present — and a much greater acceptance of the principle that all the living things on our earth have a certain right to live.

There must be good and sufficient reasons when we extinguish that curious property of matter that we call life. Before he goes into the field I believe very hunter should be sure that his reasons are good and sufficient. If they are not he can quite easily leave his gun behind and take his camera and binoculars instead.

THE VALUE OF EUROPE'S GAME



Professor Emeritus
FRITZ NÜSSLEIN
Former Director of the Institute for Hunting Studies Hann-Münden, Federal Republic of Germany

Surprisingly few people stop to wonder when meeting a hunter, from where he gets his rights to shoot. In fact the form of authorisation differs between the various countries and even within Federal States. In some countries every landowner is entitled to hunt, shoot and fish on his own territory. This is the case, for instance, in large areas of France.

Elsewhere it is possible to obtain a licence to shoot throughout the country, or in parts of it. Such permits may be limited in time or quantity; as in Spain, Scandinavia and the United States, for example. In other countries, however, shooting may be carried out only in specially designated areas, each forming a management unit where one or more individuals so authorised may shoot. Such areas may be established on the authority of the state, as in countries in Eastern Europe, or may be based on ownership of the land, as is the case in Austria, parts of Switzerland, the Federal Republic of Germany and parts of the Benelux countries. Under the latter system, the owner, if his land exceeds certain dimensions, has his own hunting grounds, while small-scale property owners may join together to make up a syndicate. There are variations, of course, in individual countries but this is the general pattern.

Turning to the question of who actually shoots, one must first correct the widespread impression that it is almost only the wealthy who shoot. How does this widespread idea come about? It is, firstly, a hang-over from the time of absolutism, when kings and princes counted hunting among their privileges and secondly, because hunting by rich people tends to attract attention, while ordinary people often go shooting unnoticed.

Only from a few countries is information available about total numbers of hunters. Some one million persons

hunt in Italy and Spain and almost two million in France. There are approximately 220 000 hunters in the Federal Republic, where these have been categorised as follows:

- 33 % craftsmen, tradesmen, professional classes
- 22 % farmers
- 20 % white-collar workers and civil servants
- 15 % pensioners and blue-collar workers
- 10 % others

This shows that hunters exist in all sectors of the community; which is noteworthy in the context of social policy.

In the last few decades hunters have certainly acquired a new competitor — and I do not mean poachers who have always been there — but road traffic. In Switzerland, traffic kills annually 20 % of the potential bag of roedeer; the percentages in Austria and West Germany are 13 % and 11 % respectively. In the case of hares, the percentages are 10 % in West Germany, and 7 % in Switzerland, so that in these two countries alone approximately 75 000 roedeer and 130 000 hares perish in this way representing a value of some six million DM (£ 700 000 or 9 000 000 French francs).

£ 35 million industry

It is also interesting in this connection to see how much the total bag for one year is worth in all the Council of Europe member States. Projecting the precise data obtained for the Federal Republic of Germany, with all reservations and caution, the result is a total of some 300 000 000 DM (£35 000 000 or 450 000 000 French francs). How much then, is the total stock of game worth in these countries? Put-



Game should be seen as a natural resource to be carefully tended and harvested.

ing the total figure conservatively at four thousand million DM (£500 million or 6500 million French francs) it will at once be seen what a valuable natural asset (seen in purely material terms) is in the hands of a country and those who shoot.

There are various answers to the question whether these countries and their hunters use these national resources as they should. First and foremost, this depends on the mentality of the people, and thus on that of the hunters in the corresponding country. Some peoples tend to love animals; others do not.

The latter think of the damage done by wild animals, while the former see them as creatures of that same nature to which they themselves feel they belong. Some shoot for a large bag only, for others hunting and shooting is their sport, while others again see themselves as the trustees of public property. All these feelings, characteristics and ideas influence hunting and shooting, its habits and practices. All European peoples regard the pursuit of the larger mammals and birds as hunting. While no one regards the pursuit of hedgehogs, rats or even mice as hunting. It is astonishing to find that, in some countries the trapping and killing of even the smallest birds is still regarded as a hunting and shooting sport — despite the fact that these species are strictly protected in other countries.

It is thus understandable that in quite a few countries there are hunters who have it thrown up against them that unrestricted shooting has contributed, and continues to contribute, to the gradual disappearance of a whole list of wild animals. There are, unfortunately, countries unable to put an end to this situation. Fortunately there are not many such countries and it is therefore all the more fortunate that most states care for their game through statutory provisions, in particular through open and closed seasons.

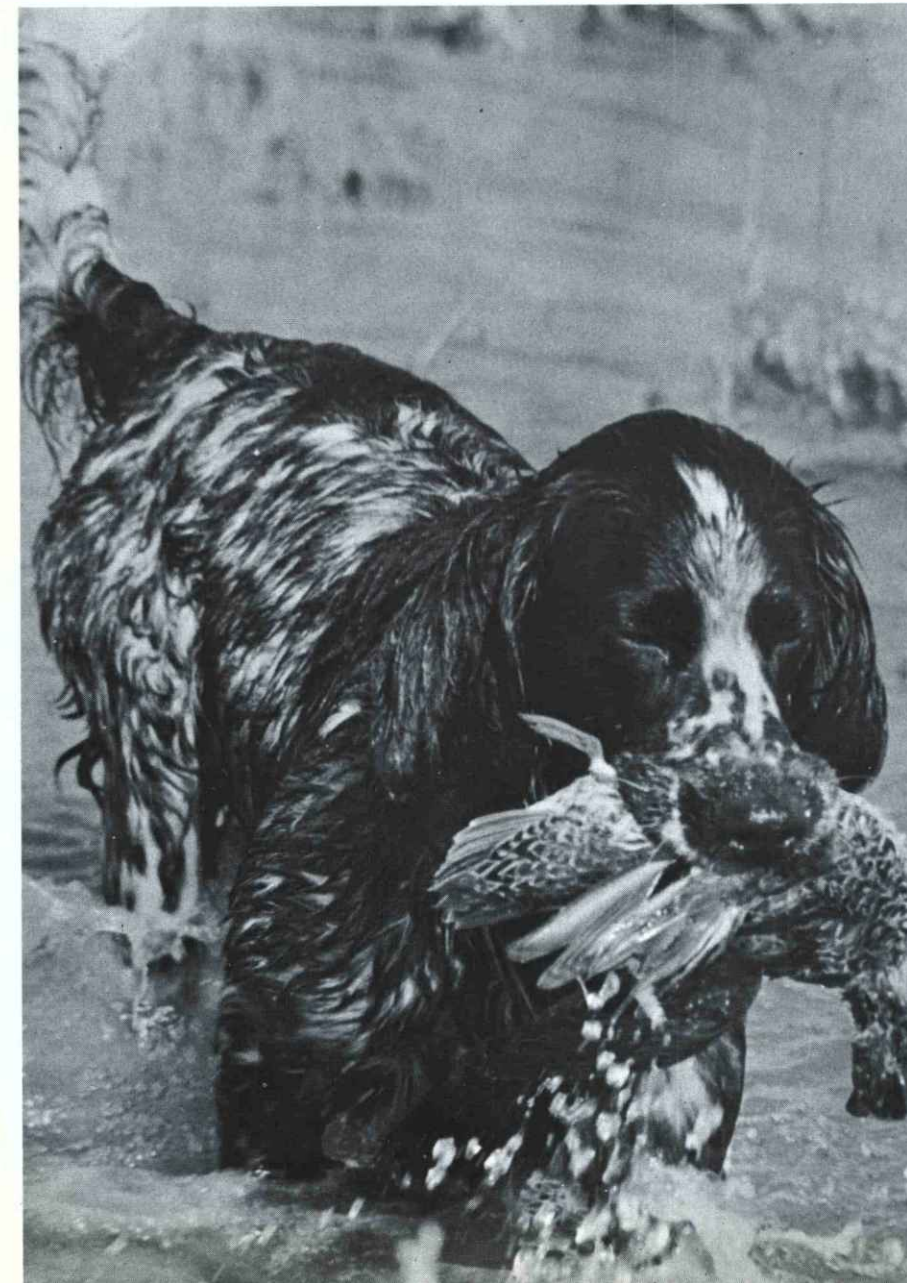
No game without hunters

No amount of legal or police regulations will avail, however, if the hunters do not themselves play their proper part. It is surprising that over hundreds of years, despite all the joys of hunting, the care of game has become a part of the real hunter. In olden days, when game still accounted for a substantial proportion of the supply of meat, it was essential to ensure that the source was not exhausted. Nowadays hunters realise that game is a part of our environment, which in a modern industrial society demands special protection. Hunting and con-



Roe buck in late winter. Only males grow antlers. These are at first cushioned under velvet and are shed again in late autumn. Roedeer are among the most important species of game for many central European countries.

Without a good dog, the hunter's best companion, much game would be lost.

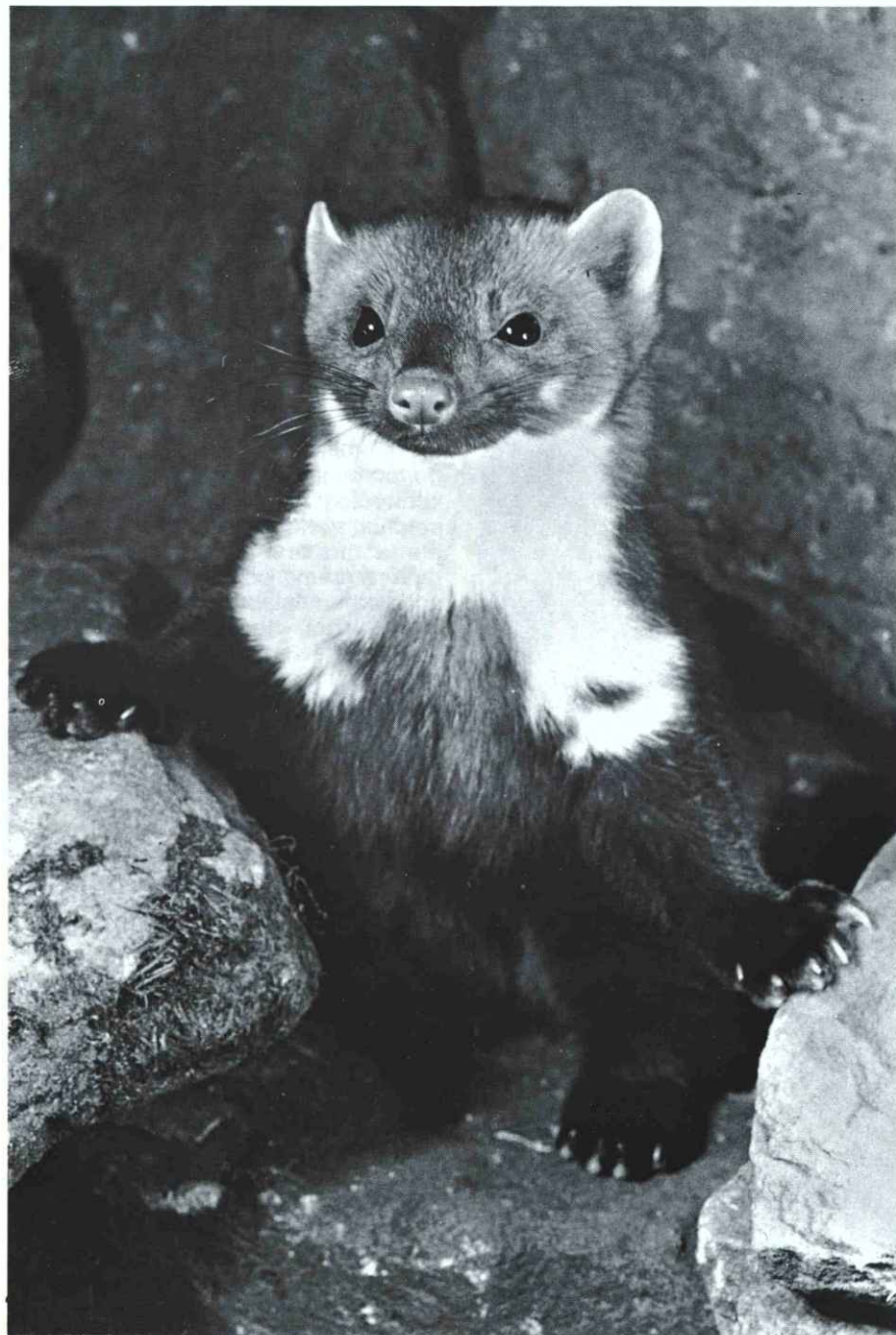


servation have become inseparable. The proverb is right, then: there would be no game without the hunter. To see the picture clearly, and completely, we must not only consider the self-restraint that hunters exercise in order to keep a certain number of game; we must also take into account what they spend. It is not easy to arrive at an estimate, because conditions vary so much from country to country. I have obtained the following data for the Federal Republic of Germany: about 85 million DM (£10 million) are spent annually on hunting rents and shooting licences, 100 million DM (£12 million) on equipment, weapons and ammunition, 30 million DM (£4 million) on the keeping of dogs, 60 million DM (£8 million) on game management and fodder, and 10 million DM (£1 million) on dues, making a total expenditure of 285 million DM (£35 million). It should also be mentioned that import and export of weapons and munitions for sports and hunting purposes are worth 120 million DM (£15 million). To give a rough idea, annual expenditure on hunting and shooting throughout Europe can certainly be put at between 1000 and 1500 million DM (£125 million and £187 million).

Research needed

If we consider all the tangible factors connected with shooting (revenue, expenditure and total value of stock) and the factors that cannot be reduced to figures (being concerned with ethical and other imponderable considerations) it is clear that this activity requires scientific research. In all countries, research into game and hunting in their ecological, practical and cultural aspects, has received a considerable boost over the last decades. Proof of this was the success of the Tenth Congress of the International Union of Game Biologists held in Paris last May. Something else emerged clearly on that occasion: over and above all ecological, practical and cultural problems, the integration of hunting and shooting with its implications for all game and other wild animals in our environment (which is evolving at such a pace that it can no longer be left without human management) has acquired a sociological and political aspect. This sheds light on the significance of hunting and shooting in modern thinking. Vindication before the public also provides the reason why hunters from all over the world came into prominence with the hunting exhibition held in Budapest from mid-August to mid-September. Here too Europe had her contribution to make.

hunting and nature protection IN THE USSR



Hans Reinhard/Bavaria

Game animals were among the first animals to be protected in the territory of the Soviet Union. One reason for this was their vital importance in the economy of primitive society. Another was that these animals were the first to come up against the powerful pressure of human society. The protection of animals by hunting regulations which had to be observed by the entire community, and the establishment of game preserves, was essential in an age in which hunting played a vital part in economic life and, indeed, in the very existence of man. The protection of game is certainly the outcome of hunting traditions many thousands of years old.

In Siberia, for example, the hunting territories were, from the 16th to the 19th century, divided up strictly according to the family principle, and 'sacred' areas, that is to say, preserves, were staked out where all hunting was prohibited. The best example of organised hunting was, at that time, beaver hunting. Features of its organisation persisted right up to the beginning of the 20th century among the Yakutes, Khantys and Mansis in the Northern Urals. A hunting season of limited duration, the preservation of a certain number of beavers (*Castor fiber*) and sables (*Martes zibellina*) for purposes of reproduction, the creation of permanent or temporary hunting preserves, all formed part of the ancient customs of the Siberians. From the 16th century on, the State assumed responsibility for game protection in Russia. During this time 'ukasy' (decrees) appeared, restricting the bag of beavers and sables in any given region, regulating the protection of game habitats against fires, culls, etc. The protection of the European bison (*Bison bonasus*) also dates from the 16th century, and in the 17th century a preserve was built around the nesting place of falcons in the Seven Isles in the Barents Sea. A decree was issued in the 18th century on the protection of elk (*Alces alces*) around the capital, and all hunting was prohibited by law from 1 March to 29 July. A series of other laws were also passed. The feudal State was anxious to protect game, above all because it was a source of tribute money and in the interests of the landowners.

With the break-up of feudalism and the development of capitalism in Russia, disorganised and massive destruction of game occurred in the search for profit. As a result, prior to the 1917 October Revolution, several species of wild animals were decimated. Sable, beaver, saiga, elk, various species of

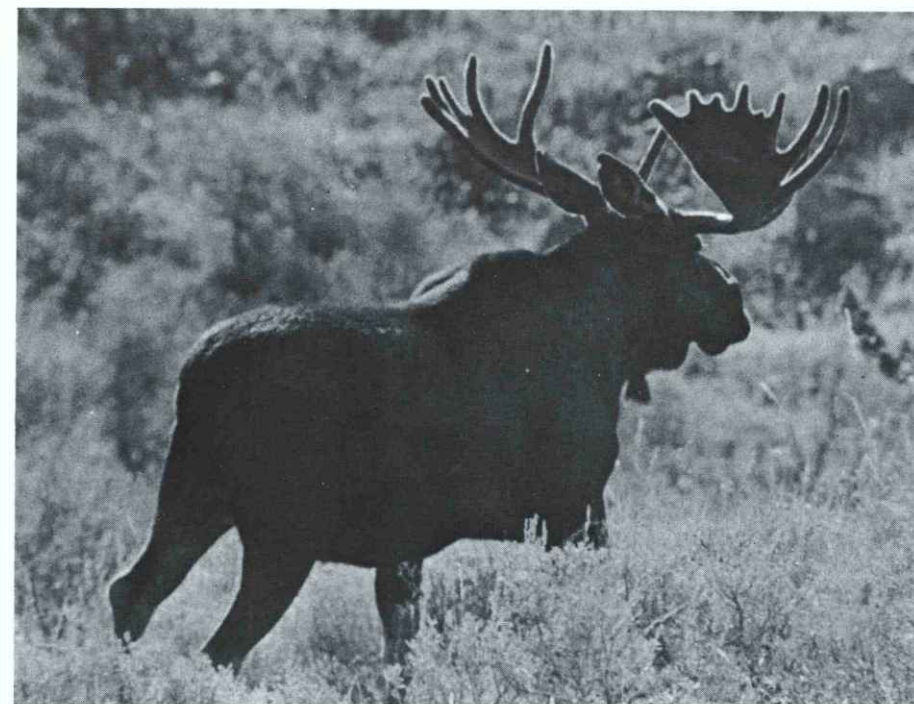
Their highly priced skins have endangered many mammal species. The picture (left) shows the stone or beech marten (*Martes foina*) that often lives in villages and is now being seen more frequently in such countries as Germany and Austria. Proper management ensures the continued existence of these beautiful animals.

The herds of European bison were depleted long ago through indiscriminate hunting, especially during the crusades and more recent wars. Vigorous conservation is preserving the European Bison, of which the largest herd is to be found in the Bialowieza Forest on the Polish-Russian border.

The elk, abundant in countries such as Sweden and the Soviet Union, wanders even into the outskirts of Stockholm and Moscow. Only the bull carries the impressive antlers.



Bel-Vienne/Jacana



Brosselin/Jacana

deer, bustards, swans and many other species of mammals and birds were brought near to extinction.

New network of nature reserves

The abrogation of private land ownership and the immense social transformations caused by the socialist revolution changed the situation radically. With the first decrees and acts of the Soviet government in 1918-1922, hunting regulations were introduced, hunting and game reserves, as well as nature reserves, were established, and laws governing the protection of rare animals and the rational utilisation of animal resources were introduced.

During the early years of Soviet power a network of nature reserves was created, the aim of which was to protect and study mainly game animals. In addition, a number of reserves were organised for the protection of special species and their natural environment. These included the Barguzin reserve for sable and the Voronezh reserve for beavers and other animals. To a large extent the subsequent creation of nature reserves was intended to allow the protection and study of game (eider in the Kandalakcha reserve, wild asses (*Equus hemionus*) in the Badkhyz reserve, etc.).

As an expression of man's relationship with his environment, hunting has of course, always implied the continuous reproduction, not the extermination of game. In other words, the hunt implied rational management in line with man's knowledge and possibilities and in accordance with natural resources. Hunting therefore meant protecting the game, since wise use of natural wealth means conserving nature.

There can be no doubt that prevailing economic conditions at the various periods of history have profoundly influenced the management of nature. It is self-evident that the more perfect the social structure is, the more rational is the exploitation of natural resources.

In the USSR the hunting of 18 species of mammals and 29 species of birds is now completely prohibited. For the hunting of ungulates (prohibited species excepted), of desmans (*Desmana moschata*), otters (*Lutra lutra*), sable, martens (*Martes martes*), beavers, fur seals (*Callorhinus ursinus*) and various other species, a special licence is required. Modern hunting legislation in the USSR requires that all hunting be carried out with due

regard to regulations concerning the reproduction and the reconstitution of the numbers of game animals.

The replenishment of various rare game species in the USSR has been successful thanks to the protective measures taken by the State and to scientific research into proper husbandry.

In the middle of the 17th century around 200 000 sables were taken in Russia annually; in 1912 only 27 000. Thanks to a ban on hunting and to the organisation of seven comprehensive nature reserves (Zapovedniks), as well as 67 special nature reserves (Zakazniks) for sables, and to the re-introduction of over 17 000 sables in more than 100 regions of their former habitat, this animal, which now exists in large numbers (approximately 800 000 individuals) has again spread throughout most of its former native Siberia. Scientific hunting standards have allowed the increase in the sable population to be maintained in nature and during culling, in spite of the resumption of hunting of this species in 1940/41. In 1950 some 40 000 sables were killed; in 1960, the number cropped or culled was 149 000 and in 1968 around 250 000, that is to say more than in the middle of the 17th century.

The saiga provides us with a similar example. Around 1922, the year in which the hunting of it was forbidden, there were only some 1000 individuals. In 1951, when saiga hunting began again the herd already consisted of 1 000 000 animals, and at the present time, although some 250 000 are being killed each year, the total number exceeds one and a half million.

These are two examples of the fact that hunting regulations are a means for maintaining and increasing animal populations.

Hunters replace predators

In the very large majority of today's ecosystems, direct or indirect human influence has disturbed the natural balance. The lack of balance is apparent first of all in a decrease in the number — but often in the complete extermination — of large predators, and this in turn has biological repercussions upon other animals. Thus in the immense territory of the Soviet Union there are at present approximately only 120 000 wolves and 50 000 bears, whilst the total number of wild ungulates exceeds six million!

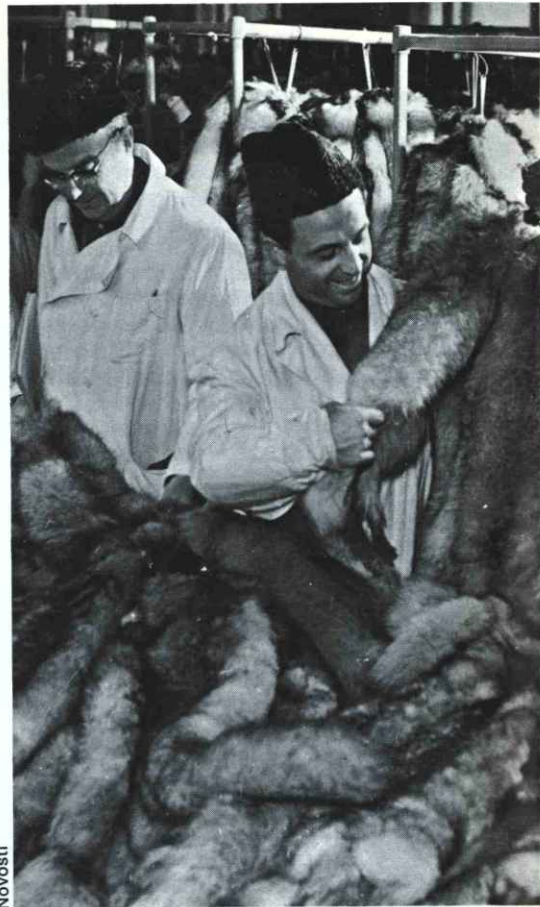
Such a small number of predatory animals has resulted in a huge in-

crease in the population of some ungulates, for example the elk, in parts of European Russia; consequently, food has become scarce and the elk population deteriorated. In these circumstances it is only the hunter who, assuming the part of the 'wolf in the fold' can ensure that the population is healthy and that it prospers. This, too, is a form of animal protection.

As regards game animals existing in sufficient numbers, they can be preserved only if they are rationally managed. Not only is hunting not in contradiction with conservation; it determines the efficiency of conservation.

On many occasions the practice of hunting has confirmed the truth of the ecological principle according to which a biologically based culling of part of the population increases the reproductive potential of the population as a whole. This is most evident among animals, such as the beaver, which have a relatively low range of adaptability to changes in the environment. After a ban had been imposed on beaver hunting, the numbers increased rapidly in the few remaining beaver colonies. The artificial replenishment of those colonies gave a considerable impetus to the increase in the total number. Once these populations, placed under absolute protection in nature and other reserves, had reached a given level, however, they became stable. Only the reopening of the beaver hunt stimulated a new increase. The culling of part of the population thus contributed to an increase in its reproductive potential. At the moment we may say that for most of the species studied, population management, such as culling, results in greater biological productivity and the increase in biological productivity is one of the most important objectives of nature protection in its modern meaning. Nevertheless, it must be borne in mind that for each species, and for the individual populations of that species, it is necessary to establish biologically the size and the qualitative composition of the cull. The need for continual biological analysis of the animal populations is obvious.

Greater biological productivity of hunting areas can also be brought about by introducing new species. This was done extensively in the USSR during the '30s and '50s, but positive and stable results are available only for certain species. The best-known example is that of the American musk-rat (*Ondatra zibethicus*). Introduced over extensive areas, from the



▲ One of the most important fur markets, Leningrad, from which the scientifically harvested crop from many precious furbearers is distributed throughout the world.



▲ Scientists, conservationists and fortunately also the public at large, are beginning to recognize the predator's vital role in a healthy environment. Man's old antagonism for wolves should soon turn into appreciation and conservation. There are too few of these intelligent animals left.

▼ One of the Soviet Union's most spectacular successes in management and conservation may well be the saiga. In the beginning of the 1920s there were probably not more than 1000. Professor Bannikov estimates the present numbers at more than 1 500 000!

Barnaby's

swamps and lakes of the taiga to the desert rivers, the musk-rat has supplied us with millions of pelts over several decades on terrain hitherto considered infertile. Moreover, the undeniable success of this gigantic experiment drew attention to the damage the introduction of a new species may do to certain ecosystems. Greater biological productivity of biotopes as a result of intensive breeding of native species of game is far more likely to be successful. Such breeding has been increasing in importance during recent years in the USSR.

Lastly, in modern circumstances where the concentration of anthropogenic landscapes is continually increasing, the hunt has to give way to mixed use of land, namely for agriculture and hunting. This is a most complicated task, since it is necessary to choose species of game which — without competing, by virtue of the peculiarities of their biology, with the main forms of land use — will augment the biological productivity of the agrocenoses. It is clear that the addition of game to agrocenoses will give the biocenoses greater stability; another of the present-day tasks of nature conservation.

Hunting can thus be seen to be a form of nature conservation, particularly if regulated on a national scale and in accordance with scientific principles.

Professor AG BANNIKOV
Central Laboratory on Nature Conservation, USSR Ministry of Agriculture, Moscow



Novosti

Nature and history – a common heritage for conservation

Because of the innumerable battles between medieval barons on the Vosges mountain range in France, this strategic area is almost littered with ruined castles. The strong sense of history in Alsace has led to many of these being conserved as historic monuments. At Nideck the opportunity has been taken to harness this conservationist spirit to protect not only man's historic heritage but also the surrounding nature in which these remains are set.

This ruined medieval castle in the Vosges, France, dating from the 13th and 14th centuries, was listed in the Sites and Monuments Schedule for Alsace and Lorraine as early as 1898. Not until 1953, however, was a protected area established around the monument. This includes about one square kilometre of the surrounding pine and beech forest and a celebrated ravine and waterfall.

The site is underlain mainly with Vosges sandstone, with a lower stratum of greywacke but the ravine is formed by eruptive rocks (violet-coloured rhyolites) and is clad with an ancient forest of maples, sycamores, wych elms, lime, ash and hazel. On its flanks are the last remaining wild yews to be found in the Vosges. Honesty and hound's tongue are to be found among the ground flora of ivy and periwinkle. Among the ruins grow wild currant bushes, wild pear trees and the biscutella with its double fruits like a pair of spectacles.

The forest fauna includes roe deer, squirrel, dormouse, fox, badger, pine marten, small rodents and shrew-mice. The rare wild cat is still an occasional visitor. The magnificent green lizard is at home among the warm rocks and the salamander in the cooler humid regions. Birdlife includes the dipper, spotted nutcracker, hazel grouse, and sometimes the capercaillie. The peregrine falcon has nested on the cliff.

Camping is not allowed and the protection order prohibits destruction of many of the above listed animals and plants.

By protecting the castle's 'habitat' much wildlife is also protected, a principle which could be much more widely applied, as will be explained in an article in the next number of Nature in Focus by M Bernard Champigneulle, Vice-President of the French 'Ligue Urbaine et Rurale'.

Dr H Ulrich



EUROPE'S CHANGING LANDSCAPES

FARMING *Europe's landscapes*

JOHN FAIRHALL,
Agricultural Correspondent,
The Guardian, London

One of the most surprising, and the most hopeful, aspects of the changes taking place in the pattern of European agriculture is the persistence of the part-time farmer. The predictions about the part-timers being swallowed up as farm units became bigger and bigger in response to the demand for greater productivity have not been fulfilled.

In some cases of course, the part-time farmer is a man on his way out, often clinging on to a small holding that is no longer viable and that will promptly be absorbed into a bigger unit after the occupier's retirement or death.

There is a trend, however, for the part-time farm to be taken on as a calculated enterprise, with no intention of it becoming a full time activity. This can be seen in its most developed form in the Southeast of England in a belt of Kent and Sussex between 20 and 50 miles from London.

In this area nearly half the farmers have other sources of income, and these part-timers control more than one-third of the farmland in the districts. Some regard their farms solely as an investment, a hedge against inflation. But the majority are there for amenity reasons, because they want to keep horses and dogs with some space around them, because they want a country environment for their children, or simply because the style of house they like living in can be found only there.

In Sweden and the United States about 20 per cent of the urban and suburban households have a second home in the country, although there is not the same interest as in England in expanding the country home to the status of a part-time farm. The disappearance of English peasants something over

150 years ago has left a nostalgia for the country life. The British tax and agricultural grants systems also help, as does the fast and frequent train service.

Now the peasant farms are disappearing all over Europe. The number of second homes in France has trebled in 16 years. The pattern of the highly populated Southeast of England could be usefully repeated.

The importance of this belt of part-time farmers is that it provides a barrier against the pressures of modern agriculture. When over a third of the land is in the hands of farmers, most of whom are there because of the specifically and usually traditional rural amenities, there is a guarantee that the landscape is going to be preserved or even enhanced.

The price of productivity

There are no such guarantees when farmers are fully exposed to the pressures of modern agricultural methods and economics. A man going into farming today and buying land at an average of £911 an acre in Belgium, £454 in Germany, and £200 even in Italy is going to be very hard pushed to get a reasonable return on his capital. It is understandable if he pursues productive efficiency relentlessly, with no margin to spare for a deliberate effort to 'keep the country pretty for townspeople to drive through', as farmers sometimes put it.

But even the farmer not under the fierce pressure of having bought his land at current prices, cannot carry on as before. Farm work is hard work, farming communities are often isolated. Wherever alternative work is available, the drift from the land gathers momentum.

In Denmark, the position has now been reached where, after long stagnation of agricultural production, the dairy industry doubts whether it could expand its production even if the door to the markets of an enlarged EEC was opened wide. This is in spite of a far better relationship between agricultural and industrial earnings than applies in France or Germany. At present there are about 135 000 farm holdings in Denmark but so few young men are being trained that it is not expected that there will be enough farmers to run more than 30 000 farms in the future.

Each country in Europe is at a different stage in the process but there seems to be no doubt that Dr Mansholt's plans for structural reform of agriculture are only a cost-conscious



Changing the scale changes the landscape. The size of fields were once made to suit the work that a man and a horse could do in a day. As horses have given way to machines so fields have been opened up and a prairie landscape has spread over many parts of Europe's farmland.



acceleration of the inevitable. And with the average age of farm workers moving up into the fifties, there can be no great delay. Traditional farming patterns must change in the next ten to fifteen years, if only because there will not be the labour to continue them. This will be so, even if the predominantly urban tax payers are prepared to pay far larger sums in subsidies to agriculture than are being paid at present throughout Europe. The retreat from the mountains, hills and marginal land has already begun. If it is not to become a rout, money, a planned diversification, and legislative control are all required.

From farming to forestry

For the Swedes the problem is comparatively simple. In a high wage economy short of labour, small farms are not viable, but forestry is. The farmers are being given financial encouragement to abandon their farms and in another 20 years much of the country will be covered in pine forest and will look much as it did in the distant past. But with the growth of leisure the forests will be put to a double use — timber and recreation.

For the remote areas of Norway the problem is different. Without the farms, supported by the government, vast regions would no longer be Norway but just barren territory. The farms are the frontier forts — an agricultural category not catered for by Dr Mansholt.

At the other end of the line are the intensive grain growing areas of France and England. Here the scale of operations has changed from that of the horse to that of the combine harvester. The pattern of small fields, with hedges to contain and shelter the livestock suits neither the modern machines nor the labour force that goes with them — perhaps only three men to 500 acres.

Given a free hand and some capital to get it under way, a farmer can decide to grow cereals and nothing else, to have fields whose size is determined by natural obstructions such as streams or by roads and which may be as big as 100 acres. The hedges are grubbed out, the trees felled, and he may think it worthwhile even to rip out the old roads and lay a new gridway of concrete machine tracks.

This is just what has happened, notoriously in the cornlands of East Anglia. And to the astonishment of regions such as Schleswig-Holstein where the authorities are religiously planting a gridwork of hedgerows and

shelter belts, the British Ministry of Agriculture pays a grant of 25 per cent towards the cost of hedge grubbing. To be fair, the Ministry's money is probably often wasted. Hedgerows in Britain have been disappearing at the rate of 5000 miles a year, and the introduction of the grant did not noticeably affect the rate.

Disappearing hedgerows

Ecological arguments have not so far convinced many East Anglian farmers that hedgerows are worth keeping. They know that every year it costs an average of £40 a mile to maintain a hedge, including an allowance for the loss of productive land. Farm accountancy and labour problems become easier if the hedges go.

The results can be awful in visual terms, and yet the arguments of the farmers cannot be wholly resisted. The answer seems to be the planned middle road, such as has been adopted in some arable areas of Northern Germany. Field size is increased to give the machine room to operate. Many hedges go, and so do many field-following footpaths. But sufficient hedges are retained, together with corner copses to provide not only pathways for the wildlife, but visual variety. Well done, the landscape retains its interest, looks and is efficient, and can be more suited in scale to the passing motorist than closed-in, small-field terrain.

If the farmer is a shooting man, there is little difficulty in persuading him to retain this basic skeleton of cover. If he is not, he will usually respond to an intelligent appeal. But education and appeals are not enough. Some statutory control is essential.

Where there is mixed or dairy farming the countryside usually looks after itself. Fields get bigger, farms get bigger, but the hedges and trees maintain their purpose as shelter, and as some kind of fencing is needed anyway, hedge maintenance no longer is seen as a complete economic loss. Often the greatest visual loss is in the farm buildings themselves. Cowsheds, and barns that have been on the right scale for centuries are rapidly becoming inadequate. Bigger herds, the advent of combines, silos, and 'factory farming' mean that, if the capital is available, most of the farm buildings that have been around for the past half century, or much longer, will have been replaced in the next ten years. With the decline in the practice of returning solid straw and manure to the land and the development of liquid slurry disposal a dairy farm can

look and smell like a sewage works overflow, and if the effluent — and the quantity from a good sized dairy farm is equal to that from a medium sized town — is not properly disposed of, the waterways over a large area can be polluted. Once again some statutory control is required.

Where land is reasonably fertile, the application of modern technology — new plant varieties, new machines, new fertilisers, pesticides and herbicides, and new breeding techniques — can keep the productivity rising. On the marginal land there are not the same possibilities. Farmers with no other source of income survive only through subsidies. The sheep farmers of most of the Welsh hills no more than cover costs from their farming. Without government grants and deficiency payments, their income would be nil or they would be losing money. Large areas of Wales are following the pattern of rural depopulation that has emptied the villages of Western Ireland and some of the more arid upland districts of France.

Farming for tourists

Each year the marginal areas get left further behind in the general economic advance and it is now clear that the limit has been reached in the amount of subsidy governments are prepared to pay to keep going purely agricultural operations. Relief can come only from tourism and recreation, unless a counsel of despair is adopted and the land left to revert to scrub or, where it is possible, is covered with conifers. Some of the big private land owners of the Welsh hills have already decided that trees are more profitable than sheep. The number of jobs available is falling, the schools are closing in the villages and a way of life disappearing.

It needs only one field rented out as a camp site to make a small farm a viable proposition. A summer season of taking in guests at a farm house, an urban fishing syndicate renting the waters, a winter as mountain guide or ski-ing instructor — anyone of them is enough to keep a community in being. Enough also to enable the farming operations to continue which have given the landscape its form.

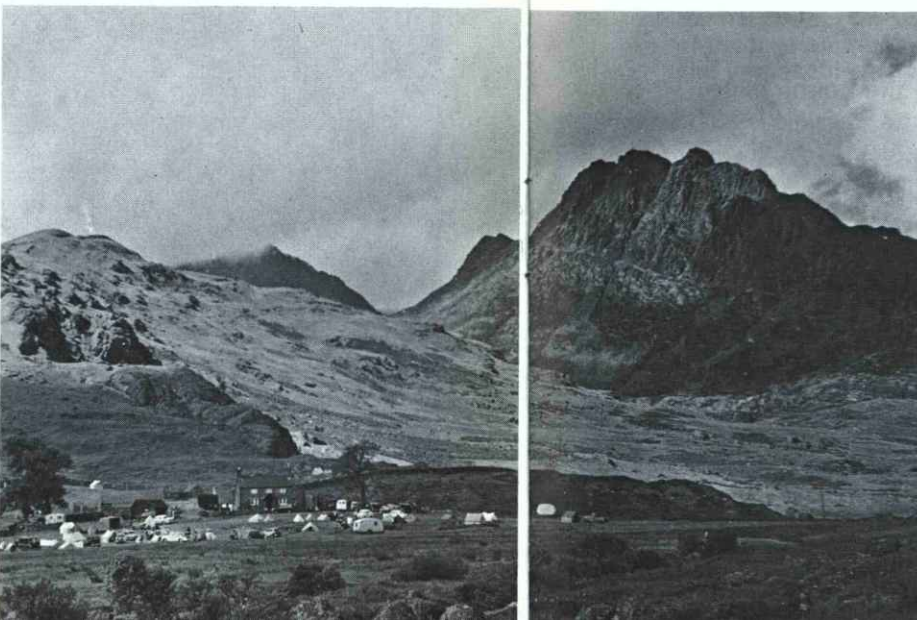
Where there is a firmly established tradition of tourism, such as in the Swiss Alps, the progressive change-over to a dual farming cum tourism way of life goes smoothly. In other regions — Carinthia for example — the timing has got out of phase and the high farms are being abandoned and rebuilt on lower ground where



Aerofilms



Popperfoto



Barnaby's

◀ **Patchwork quilt.** This familiar landscape pattern is the natural countryside to many town dwellers. In fact it is an artificial landscape created by man. The natural cover is forest which was long ago replaced by arable fields in the valleys and open grazing on the hills. As sheep hill-farming is no longer profitable much upland is reverting to scrub (as in parts of this photo) and may eventually return to forest; and scenic walks beloved of townspeople will be lost.

While farmers in Denmark are planting shelter belts to prevent wind erosion (centre), 5000 miles of hedgerows are being grubbed up every year in England (below). Lowland landscapes in many parts of Europe will look much as they did before the main hedgerow-planting era of the 18th century.



Brian Hawkes

road access is possible. The forest closes in on the clearings where the cattle used to graze in summer, and the all-important variety goes from the landscape.

Sooner or later the swelling urban population will be clamouring for access to mountains, hills and heathland wherever they may be, as they do now in the selected spots. Timing is everything. Recreational use has to be phased in before the land becomes derelict. If forests are planted, the camp sites, picnic sites, car parks, footpaths and wildlife observation areas need to be planned from the start. Farmhouse holidays need the backing of national tourist organisations — something that has long been obtained in the Scandinavian countries and is now operating in Holland. Camp sites need both publicity and enforceable minimum standards.

The great need is for capital, to provide not just the roads, lifts, hotels, but the social amenities required by the people who live there all the year. There could be few more worthwhile national investments. In the meantime, as a holding operation, is there any alternative to subsidising the marginal farmers?



◀ **'... one field rented out as a camp site to make a small farm a viable proposition.'** This is just one of several possibilities open to upland farmers to help them augment their incomes so they can afford to maintain their farms. But the local authorities must provide a proper infrastructure for tourism which might be cheaper in the long run than hillfarm subsidies.

EUROPE'S CHANGING LANDSCAPES

TOWNSCAPE and landscape in europe

For reasons of space and owing to lack of basic documentary material, only a rough picture can be given of the effects of urbanisation on the countryside in Europe. The subject will be dealt with under the following headings: the process of urbanisation, the present situation, and problems to be tackled.



Hans Joachim Schmidt

The process of urbanisation

Around the year 1800 the population of Europe was probably about 190 million. By 1970 the population had risen to some 450 million and is likely to increase to between 520 and 570 million by the year 2000. The present population is spread very unevenly over the 5 million or so square kilometres of Europe. In 1970, almost 70% of the population were living in less than 40% of the total area. Most of these inhabited areas are less than 500 metres above sea-level and within 500 kilometres of the coast, that is, in the best places from the standpoint of habitation, economic conditions and communications. Thus, the greater part of Europe's population is concentrated in a belt of land a few hundred kilometres wide running from Central Russia to Great Britain via Czechoslovakia, Northern Italy and Denmark, with population densities ranging between 200 and 1000 or more inhabitants per square kilometre.

Around 1800 the urban population of Europe was probably less than 20% of the total. By 1970 this proportion had risen to over 50%, with, of course, regional and national variations ranging from 30% (Albania) to 80% (Great Britain). In 1970 built-up areas (including areas taken-up by industry and communications) covered an estimated 50 000 to 60 000 square kilometres of Europe, only about 1% of the total area of this most highly populated continent in the world. On the basis of inhabited areas, therefore, it is scarcely possible to say that Europe is becoming urbanised in the strict sense of the term. The term is, nevertheless, often used, usually in an unfavourable sense. This is because urbanised areas are constantly threatening to expand and, at the same time, serious harm is being done to the countryside as a result of growing air and water pollution and increasingly difficult traffic and living conditions.

Effects on the countryside

Urban and industrial areas are not merely conglomerations of surface and underground structures representing the 'petrification' of the countryside in Europe, for within their boundaries is concentrated cultural life, in all its aspects, which influences the rural population too. The specific architectural character of the towns is derived from their houses, schools, museums, theatres, administrative buildings, squares and avenues, mostly belonging to different styles. Industrial and



Carl Näher-Bavaria

▲ '... growing towns have carved up the countryside so the landscape is now simply patches of forest surrounded by expanses of farmland and built-up areas.'

Enormous quantities of earth are moved every year to meet the needs of industry and urbanisation. Below: an open cast mine in England.



Aerofilms

Almost 70% of the people of Europe are crammed into less than 40% of the land surface where they have caused an immense and irrevocable impact over large tracts of the landscape. ▼



Aerofilms

urban areas however undoubtedly cause damage to the countryside. Not only do they oust plants and animals but, through air and water pollution and soil deterioration, they jeopardise the existence of the population itself. This of course applies particularly to Europe. Unfortunately there are few sources of comprehensive and systematic statistics such as the admirable inventory, 'The demands on the countryside' (Zur Belastung der Landschaft), issued in 1969 by the Federal Institute of Botany, Nature Conservation and Landscape Protection in Bad Godesberg.

Nevertheless it can be stated that because of urbanisation and industrialisation whole plant communities as well as individual plants have suffered serious damage. In Italy and Greece in Ancient times, and elsewhere in the Middle Ages, the growing towns began to carve up the countryside so the landscape is now simply patches of forest surrounded by expanses of farmland and built-up areas. As a result, forestland now accounts, on average, for only 30% of the total area of Europe. In Great Britain, it is less than 10% but, in Finland as much as 70%. The effects of civilisation, too, continue to exact their toll. In Germany, for instance, some 50 000 hectares of forestland are destroyed every year, through the effects of sulphur dioxide, representing a loss of more than 20 million DM. Another phenomenon connected with urbanisation, though not directly caused by it, is the progressive disappearance of plant and animal species.

Apart from changes to or the destruction of habitats there are various possible reasons for this, including agricultural improvement schemes (especially drainage), the use of fertilisers, seed-dressing, the use of herbicides, afforestation with non-indigenous species, and water and air pollution through industry and motor traffic. In the region of Paderborn in North Rhine-Westphalia, for instance, 6% of the once indigenous plant species have become extinct in the last 100 years, whilst around Berlin the proportion is 13%, that is 124 species. And if in the Swiss canton of Aargau, which still has such extensive natural landscapes as the Reuss Valley, more than 385 out of 1300 plant species have died out since 1800 or are in the process of doing so, it can be imagined that the situation must be much worse in many other highly populated and industrialised parts of Europe.

As indicated at the outset, what urbanisation and industrialisation demand above all is, of course, land. Moreover, through levelling, excavation and the creation of embankments, they have altered the earth's contours on a scale which, although difficult to assess, is clearly considerable. As Professor Steers showed in his article in the previous number of *Nature in Focus*, this is especially true of coastal regions. We need only add here the figure of 2500 kilometres of artificial coastline which have been created in the Netherlands! In Great Britain it has been estimated that a total of more than 30 million cubic metres of earth had been excavated through mining operations and cuttings (railways, roads, canals) by 1913. Ninety per cent of this was attributable to mining, which is thus the biggest direct transformer of the earth's surface. In combination with other factors, mining gives rise to considerable hazards by causing subsidence and caving-in. Examples of such hazards and damage are to be found in practically every country (an example in Switzerland is the Rhine Valley salt deposits between Basle and Lake Constance). We may also note the threat to soil and hence indirectly to man himself which arises from landslips caused by development schemes, particularly in mountainous areas.

The present situation may therefore be summed up as follows: only a small part of Europe has been urbanised and industrialised when it is considered that between 80% and 90% of the continent is still forest or farmland or else wasteland. In industrial and urban areas there is the rather paradoxical situation in which an accumulation of intellectual power, great technical progress and advanced living standards is accompanied by extensive environmental deterioration as a result of excessive building, traffic, industrial activity, etc.

It is in such areas that the greatest threat to man is concentrated. Rural areas and areas where no activity is carried on remain as 'oases' where man can still lead a healthy life. Given the present alarming encroachment on these oases from towns and industrial regions and in view of the fact that urbanisation is a basic trend for the foreseeable future, it is easy to understand why many people from all sectors of society are trying to take preventive action. If countermeasures are to be taken, the scale of the damage done so far needs to be assessed. This, however, is not at present possible, but the

The shadow of the Post Office Tower in London points like a sun-dial over the largest single urban conglomeration in the world. '... what urbanisation and industrialisation demand above all is land.'



partial data available indicate that the results of any such assessment would by no means be optimistic as far as Europe is concerned.

Solutions

What is the solution to the problem outlined above (any solution also being — basically — an effect of urbanisation)? The best brains have long been racked over this question, particularly in Europe. Should towns be reduced in size, or at any rate not allowed to get any bigger in size or number? Are technical facilities available for controlling and eliminating water and air pollution, noise and deforestation, all of which are on the increase? To frame the questions is to answer them. Undoubtedly there are various possible solutions. It would, however, be scarcely possible to prevent urban and industrial areas from spreading any further — short, perhaps, of stringent birth control measures to keep the population at its present level. Instead, development, particularly in the technical field, ought to be guided in such a way that, through proper planning, sufficient green and open spaces, including protected areas, are preserved to provide people with adequate facilities for recreation outside their homes and places of work. Extensive preservation of all areas which have not yet been urbanised remains, therefore, a cardinal principle. This requires, notably, a policy of assistance to rural populations which are being seen more and more as the indispensable guardians of the countryside. In addition, technical facilities need to be provided so the various sources of pollution can be kept as fully as possible under control or even eliminated. In this regard, data, norms and principles are at present being produced. These relate not only to questions of siting and scale and to financial, legal and political aspects; they also cover technical, hygienic and architectural aspects. To ensure that whatever is humanly possible is done in this direction, a large body of perspicacious persons is at work collaborating at both national and international level. Their efforts hold out the prospect that Europe may one day be advancing along this very path.

Dr E WINKLER,
Professor of Regional Planning and Social Geography, Federal Institute of Technology, Zürich

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

FIVE YEAR PLAN FOR EUROPE'S ENVIRONMENT

A new five-year plan for environmental activities was studied by the European Committee for Conservation of Nature and Natural Resources at its tenth meeting from 1 to 4 June 1971.

The programme reflects general agreement that the natural environment must be managed on a scientific basis and be recognised as a determining factor in decision making in all human activities and areas of government administration.

The overall environment scheme is threefold, dealing with:

- natural resource issues relating to air, fresh water, soil, flora and fauna — control of major forms of pollution and development of rational methods of solid waste disposal
- the creative management of the countryside, including the coasts and coastal waters, promotion of policies which will help to achieve optimum use of land and water
- information of the general public, education at all levels, and training of environmental specialists for industry, agriculture, tourism, local and national administration.

The plan is being put before the Committee of Ministers of the Council of Europe for approval by governments.

SCIENCE AND PARLIAMENT

Some 150 scientists, scientific administrators, and scientific journalists will meet with European parliamentarians in the third parliamentary and scientific conference to be organised by the Council of Europe from 11 to 14 April 1972 in Lausanne. The following three themes will be debated:

- parliamentary democracy in the scientific and technological age;
- European science policy;
- management of technology and parliamentary control.

PROTECTING EUROPE'S WATER

A top priority drive to curb water pollution is under way at the Council of Europe. Experts from 11 countries are meeting regularly to draft a European Convention on the Protection of International Fresh Waters against Pollution which is scheduled for signature next year. The draft includes a system of inter-State liability for pollution. This provides that States would be held responsible for any damage on the territory of others caused by water pollution contravening the minimum standards of the draft Convention or

the special regulation on admissible levels.

This move, which is the first attempt to bring international legislation to fight pollution, should have a determining effect on the quality of Europe's fresh water resources.

CLEAN AIR ACROSS THE BORDER

The Committee of Ministers of the Council of Europe has recommended that governments of member States ensure for the inhabitants of regions beyond their frontiers the same protection against air pollution in frontier areas as is provided for their own inhabitants.

To this end they should in particular ensure that the competent authorities inform each other in good time about any project for installations liable to pollute the atmosphere beyond the frontier.

The competent authorities beyond the frontier should be able to make their comments on such projects. These comments should be given the same consideration and treatment as if they had been made by the inhabitants of the country where the plant is situated or proposed.

Polluted air is regularly blown into another country from chimneys in this border town.



CALL TO LIMIT LEAD POLLUTION

Concerned about the great increase in emissions of lead from motor exhausts in the last few years, the Committee of Ministers of the Council of Europe has recommended governments of member States to consider decreasing the quantity of lead compound emitted by motor vehicles, or at least preventing further increases. This should be done by applying suitable practicable limits to the amount of lead added to motor-fuels in consultation with the appropriate parties, including the medical authorities, the oil companies and the motor manufacturers.

The Ministers also recommend that governments research into the effects, not only of lead compounds, but also of all other pollutants emitted by motor vehicles, and into the best technical means of reducing all such emissions.



Jan Rietz/SNF

THE MOUFFLON IN CYPRUS AND TURKEY

A mosaic from the third century AD and a neolithic skull of about 5000 BC, both found on Cyprus, show so close a resemblance between the ancient moufflon and that of today as to prove that a Cypriot variety of *Ovis ammon orientalis* does exist. This is one of the conclusions of Dr JL van Haaften who visited Cyprus and Turkey on behalf of the Council of Europe last year to report on the moufflon to the Turkish and Cypriot governments (see Nature in Focus, Spring 1970, p 16).

Dr van Haaften also concluded that the natural resources in the Paphos Forest could allow the population of moufflon to increase beyond the present level of about 200. The main problem is poaching in this area of largely uninhabited hilly forest.

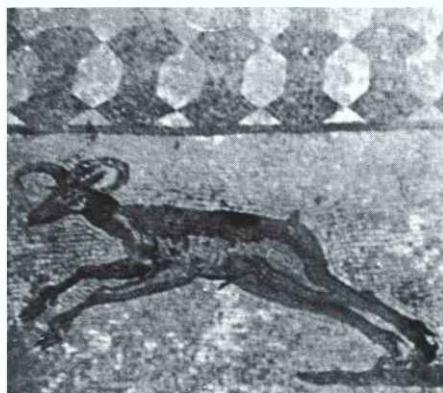
Wardened reserves with heavy anti-poaching fines are, therefore, among

the main proposals made to the Cyprus government by the Council of Europe expert. These reserves should have additional watering places and areas cultivated to provide food, with proper irrigation systems fed by mountain streams. Dr van Haaften envisages the eventual cropping or hunting of moufflon by local people and insists on the importance of informing the public throughout.

In Turkey the moufflon still existed west of Ankara up till 1957. This population disappeared when an artificial lake was constructed. The only area in the neighbourhood of Ankara where moufflon may still be found is in the Konya-Bozdag Reserve, some 270 kms south of the city, where between 30 and 40 animals were known to exist when the reserve was created in 1966.

Another reserve was set up in eastern Turkey, south of Lake Van, in 1970 where about 600 moufflon are said to live. In the very poor steppe area of about 40 000 hectares east of Konya with hills up to 1700 metres, where almost nothing grows because of the 40 000 to 60 000 sheep and goats which graze there, about 80 to 100 moufflon are still to be found.

Local reforestation and the creation of wardened reserves and watering places are among the conservation measures advised to the Turkish government.



Third century AD mosaic of Cyprus moufflon.

JL van Haaften

SHORT NOTES

International environmental engineering

The Davy-Ashmore group of London has set up an Environmental Engineering Division to co-ordinate its growing interests in the anti-pollution field, following the acquisition of two more firms — one in Britain, and the other in Italy.

The companies are Young Chemical Engineering, of London, and D-A Italia SpA of Milan, both specialists in the design and construction of water and effluent treatment plants.

The group has long been concerned with pollution control and notable examples are the water treatment work done by its Federal German subsidiary, Bamag Verfahrenstechnik and the work of Wellman Power Gas Inc, its wholly-owned subsidiary in the United States, whose sulphur recovery process is said by Davy-Ashmore to lead the field.

Says the group: 'These new acquisitions make Davy-Ashmore one of the major British companies concerned with the supply and construction of water treatment plants and pollution control equipment.'

The new division will specialise in industrial, municipal and domestic water treatment plant. It is expected that 75% of its business will be in markets outside Britain.

Davy-Ashmore International, 15 Portland Place, W1A 4 DD

Conservation volunteers exchange

The first ever international exchange of young conservationists took place this summer between the British Trust for Conservation Volunteers and the Italian branch of the World Wildlife Fund. Sixteen experienced British volunteers travelled at their own expense (by plane, train, bus and hitchhiking) to work on conservation tasks during their summer vacation in the Gran Paradiso National Park and at Bolgheri in Tuscany. The Italian volunteers, who had their first experience of conservation work on tasks organised by the World Wildlife Fund last year, had a choice of some 40 different tasks throughout Britain, on which they gained further experience during the summer vacation.



H Verdonk/WWF

Two visitors from the far north (pinkfooted geese and barnacle geese) meet for the winter in Ireland and the Netherlands.

Pink-footed goose threatened

Little known, but nonetheless important, is the fight to save an area on Iceland which is important as the breeding ground for about two-thirds of the total population of the pink-footed goose, *Anser fabalis brachyrhynchus*. This wetland, known as the Thjórðsáver area, is threatened by the plans of the Icelandic Energy Authority to develop the upper part of the river Thjórðsá. This would almost completely flood the unique ecosystem in which the geese breed. The Icelandic Council for Nature Conservation proposed in 1969 that this area should be set aside as a nature reserve. The 15th world conference of the International Council for Bird Preservation addressed a resolution in 1970 to the Icelandic government with the same intent. The government responded by providing 2 million kronas (about £10 000) for research into ways of mitigating the effects of the planned development; but the original plans have so far not been changed.

This summer a team of scientists has

been working on an ecological inventory of the area. In view of the urgency, an application has been made to the WWF for a grant so the work may be completed next summer. Icelandic conservationists have good hopes that a solution may be found so that at least parts of the Thjórðsáver area may be saved.

European Environmental Education Conference

A European Working Conference on Environmental Conservation Education is to be held at Rüsclikon (near Zürich) Switzerland, 15-18 December 1971. The conference hopes to define principles of European environmental education programmes with special attention to primary and secondary school levels, and to teacher training. It is also hoped that this Conference will promote an increased interest in environmental conservation education in south European countries.

Further details can be obtained from the Education Executive Officer, IUCN, 1110 Morges, Switzerland.

Recycling chemicals and cans

The antipollution outcry, often accused of being exaggerated by industrialists, is in fact making them think again, to the extent that they are sometimes saving money. Giant international companies, such as Eastman-Kodak and Ford, have already reacted and now United States Steel has announced that it will convert steel-processing wastes into chemicals with other uses, rather than dump them into the sea. An estimated 10 to 12 million gallons (45-55 million litres) of hydrochloric solutions annually will be sold (rather than thrown away!) to the Imperial West Chemical Company which will convert the chemicals, mostly for use in sewage treatment plants.

It can be done!

Four major American can manufacturers are setting up recycling centres all over the country that will recycle any kind of metal can. By the end of 1971 some 200 centres are expected to be in operation, mostly at can

company factories. Until 'recycling' became an 'in' word millions of cans were dumped daily. Now recycling promises to be so profitable that plans are being worked out for consumers in communities without factories to get their cans into a recycling programme.

Conserving the Atlantic Salmon

A closed season for fishing for salmon at sea was introduced for the first time this year by the States signatory to the North East Atlantic Fisheries Convention. This follows fears expressed in the North East Atlantic Fisheries Commission that the recent rapid growth and apparently unlimited capacity for expansion of a high seas fishery could affect stocks of salmon (*Salmo salar*).

There is as yet no scientific evidence to show that stocks have been affected and the decline in salmon runs could be due to a number of causes, not least of which could be pollution of the rivers concerned. But tagging experiments, begun some 5 or 10 years ago, to provide conclusive evidence would need to run for 20 or 30 years. In the meantime the current regulation prohibiting sea fishing from 1 July to 5 May should be an effective holding operation.

Related conservation measures include the banning of trawl nets, monofilament nets and trolls; limitations on hook sizes and mesh sizes and the size of salmon which can be taken.

Zoos aim to protect and conserve animals

The problem of badly-run zoos in Italy has led to the foundation of the Unione Italiana Giardini Zoologici, under the Presidency of Professor Ermanno Bronzini, Director of the Rome Zoo, and including the zoos of Naples, Turin, Milan, Verona and Oria.

The Union will work for proper management of zoological gardens and oppose proliferation of purely commercial gardens and parks run by people with few or no qualifications. It will make a formal request that no authorisation be given for the establishment of new zoological gardens and parks, or safari parks, without the official approval of a recognized technical body. This should:

- ascertain the scientific and educational aspects of the proposed new zoo or park, which should not be only recreational and commercial;

- approve the installation, cages and enclosures, which should be safe, hygienic, sufficiently spacious and suitable for the animals on exhibition;
- make sure that the principles of wildlife conservation are followed and that no animals of protected species are obtained without official authorisation, and that the maximum efforts are dedicated to the breeding of rare species in captivity.

The proliferation of zoos and wildlife parks is becoming a problem in most European countries. For those countries in which controlling or advisory bodies do not already exist advice may be had from The Zoos Group of the Survival Service Commission, IUCN, 1110 Morges, Switzerland.

International environment course

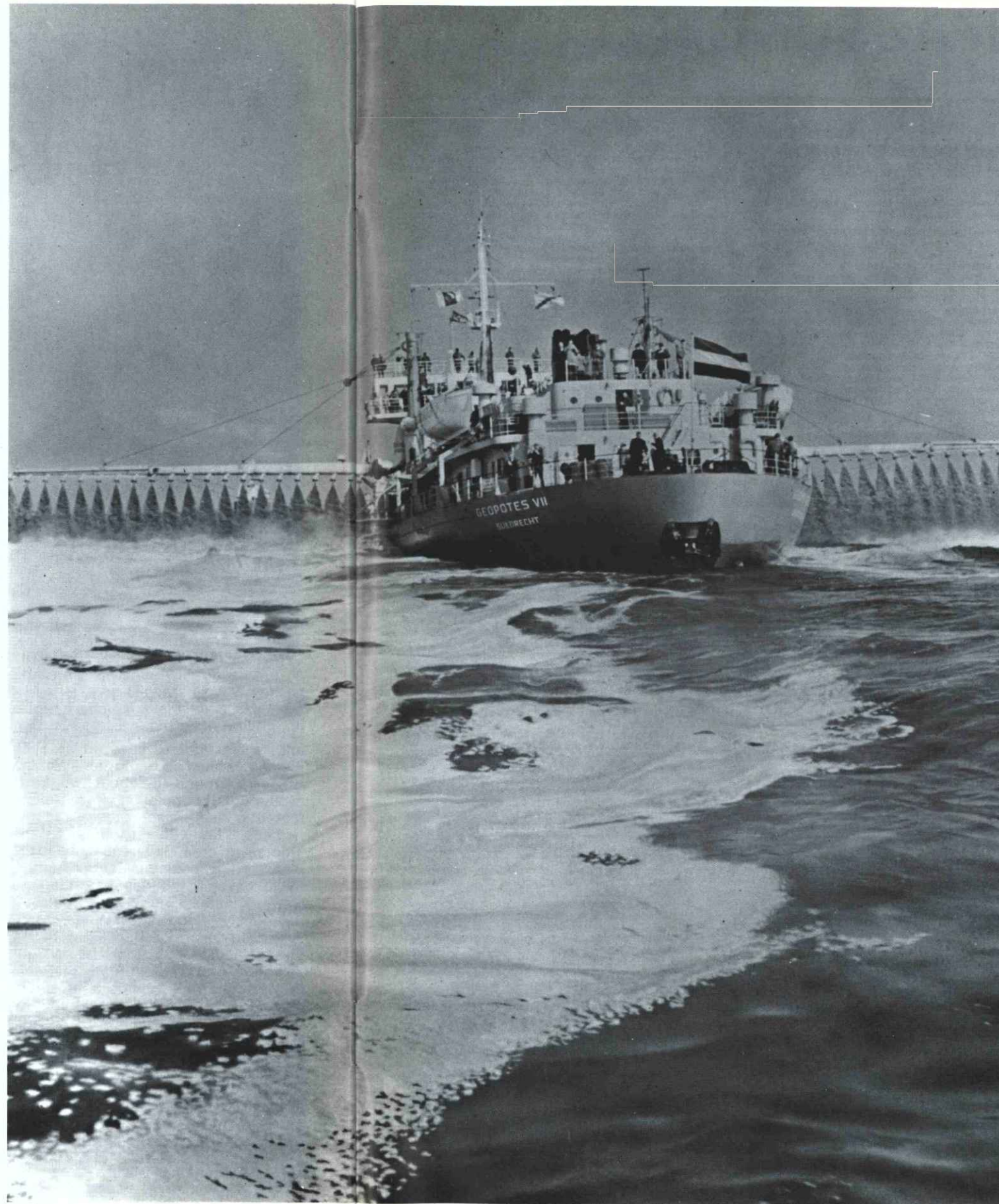
An international course in environment science and technology is to be run from 27 October 1971 to 8 September 1972 at Delft in the Netherlands. This course is intended for graduates in chemistry or biology and will deal with environmental chemistry and biology as a basis for solving practical ecological problems in industrialised as well as developing areas. There are also courses in hydraulic engineering and in sanitary engineering; and a course for hydrologists.

The language of instruction is English.

Further information may be had from Netherlands Universities Foundation for International Cooperation, 27 Molenstraat, The Hague, The Netherlands.

Oil industry to the rescue

The oil industry is apparently taking its responsibilities seriously as regards pollution. No doubt it does not wish to suffer the same fate as the pesticide industry which acquired a very bad public image when it ignored or made light of early accusations of poisoning or pollution and is now having to work very hard indeed to regain its reputation as a responsible producer of plant protection products. Recent publications of Stichting Concawe, the Foundation of the oil industries study group for the conservation of clean air and water in Western Europe, include a review paper on the protection of water against oil and a contingency plan for oil pollution of the sea.



The first of these summarises the conclusions of recent specialist conferences. It includes an eighty-entry bibliography and shows, almost at a glance, what has been done and what remains to be done to prevent and to combat oil spills on land and water. The contingency plan for accidental oil pollution of the sea is a translation of a survey submitted to the Italian Ministry of Mercantile Marine by Unione Petrolifera and Ente Nazionale Idrocarburi. It should help other countries who are preparing such contingency plans as it contains a section on the operating principles of anti-pollution defence systems, a list of clear instructions for an emergency procedure, a concise description of the behaviour of oil slicks, a short list of factors to consider when unloading damaged ships and a detailed list of salvage equipment. But most interesting of all to other countries which may already have done much of the above ground-work is a plan for cooperation between Mediterranean countries and the draft of an agreement for such cooperation.

Stichting Concawe, President Kennedylaan 21, The Hague, Netherlands.

Technique developed by the oil companies: chemically prepared sand is sprayed onto crude oil, sinking it to the bottom of the sea where it will decompose naturally. Although effective in clearing oil slicks it is still not an ideal solution as it merely kills unseen life on the seabed, instead of on the seashore or at the surface.



ZUSAMMENFASSUNGEN

DER JÄGER UND SEINE VERANTWORTUNG — S 3

Dr. IG van Maasdijk
Präsident des Internationalen Jagdrats

Schaffe man die Jagd ab, so würde alles Leben in der freien Natur darunter leiden. Die bisher vom Jäger geschützten Lebensräume würden für die Landwirtschaft genutzt und das bisher durch Jagdgesetze geschützte Wild abgeschlachtet werden, während andere Lebensformen völlig untergehen würden.

Der Fremdenverkehr, Wilderer, Zoos oder Trophäenhändler richten weit mehr Schaden an als Jagdsportler, die wildes Leben erhalten.

In allen Ländern sollte es in internationalen Abkommen verankerte Jagdgesetze geben. Der Internationale Jagdrat mit seinen Unterorganisationen, zu deren Mitgliedern ebenso viele Wissenschaftler und Anhänger des Naturschutzgedankens wie Jäger zählen, ist gegenwärtig mit der Ausarbeitung solcher Konventionen beschäftigt.

«MEINE FLINTEN HABE ICH VERKAUFT» — S 5

Peter Scott CBE., DSC., LI.D
Erster Vizepräsident und Vorsitzender des World Wildlife Fund

Schon seit jeher hat der Mensch Tiere getötet, zu seiner Ernährung, zu seiner Sicherheit oder zu seinem Vergnügen. Auch weiterhin ist er gezwungen, für seinen Lebensunterhalt und gelegentlich auch zu seinem eigenen Schutz und zur Erhaltung seiner Vorräte zu töten, jedoch ist das Töten aus reinem Vergnügen keine Notwendigkeit. Der Autor selbst gab das Schiessen auf, nachdem er eine Gans angeschossen hatte und sie niederfallen und vor ihm elend hatte zugrundegehen sehen.

Die meisten Jagdsportler jagen nicht um das Töten willen, sondern um das Leben unter freiem Himmel zu geniessen, und viele sind dazu übergegangen, mit der Kamera zu «jagen». Aber man kann andere nicht zu der Entscheidung zwingen, das Jagen aufzugeben, und man wird immer in das Leben eingreifen müssen, da sich die verschiedenen Arten von jeher unter dem Einfluss des Menschen entwickelt haben. Wenn man jegliche Jagd auf Vögel und Säugetiere unterbinden würde, wäre die Lage nicht mehr zu beherrschen und das Töten müsste zwangsläufig wieder aufgenommen werden; in einem solchen Fall würde aus einer anregenden Freiluftbeschäftigung eine unangenehme Pflicht werden.

Wichtig ist, dass eine grössere Achtung vor dem Leben bestehen und immer ein ausreichender Grund zum Töten eines bestimmten Tieres vorhanden sein sollte. Bevor er seine Jagd gefilde betritt, sollte sich der Jäger vergewissern, ob er gute und ausreichende Gründe zum Schiessen hat — ist dies nicht der Fall, dann sollte er sein Gewehr zuhause lassen und sich mit Kamera oder Fernrohr bewaffnen.

ÜBER DIE JAGD — S 8

o. Professor em. Fritz Nüsslein,
Hann-Münden, BRD.

Bei der Regelung des Jagdrechtes muss man zwischen dem Parzellen-, Lizenz- und Reviersystem unterscheiden. Etwa dreieinhalb Millionen Jäger gibt es innerhalb aller Europaratsmitgliedstaaten; sie entstammen allen Kreisen der Bevölkerung. Ihre Jagdbeute im Jahr hat einen Wert von etwa 300 Millionen DM. Der Inventarwert des lebenden Wildes kann auf vier Milliarden DM veranschlagt werden. Der jährliche Aufwand der Jäger mag ein bis eineinhalb Milliarden DM betragen. Für den modernen Jäger, insbesondere in den Industriestaaten mit ihrer sich stets wandelnden Umwelt, ist die Hege des Wildes neben der Bejagung zu einer Selbstverständlichkeit geworden, die die Öffentlichkeit aufmerksam wahrnimmt. Wild- und Jagdforschung finden daran eine Orientierung, die Weltjagdausstellung 1971 in Budapest legt dies offen.

JAGD UND NATURSCHUTZ IN DER UdSSR — S 10

Professor Dr. AG Bannikov,
Zentrales Naturschutzlabor, Landwirtschaftsministerium, Moskau, UdSSR

Die Wildarten wurden als erste Tiere unter besonderen Schutz gestellt, da sie schon seit frühester Geschichte für die Gesellschaft eine wirtschaftliche Bedeutung hatten und als erste der menschlichen Gewalt unterlagen.

Wir können auf eine jahrhundertalte Jagdtradition zurückblicken und besitzen Angaben über die geschützten Tiere. Der Untergang des Feudalsystems in Russland führte jedoch zu einer unkontrollierten Verfolgung des Wildes und von Tierarten wie z. B. Zobel, Biber, Steppenantilope, Elch, Trappe und Schwan, die im Jahre 1917 beinahe ausgerottet waren.

Die sowjetische Regierung stellte von 1918-22 wieder eine neue Jagdordnung auf, richtete Naturschutzgebiete ein und schaffte Gesetze zum Schutz seltener Tierarten. Diese Massnahmen bilden mit dem Schutz der natürlichen Hilfsquellen eine wesentliche Politik.

18 Säugetier- und 29 Vogelarten sind voll geschützt, und für die Jagd auf Silberbism, Otter, Zobel, Marder, Biber, Pelzrobber und verschiedene weitere Arten ist eine Sondergenehmigung erforderlich. Die Erweiterung der ehemals gering gewordenen Bestände an Zobel und Steppenantilopen wird als Erfolgsbeispiel für diese Politik angeführt; beide Arten liefern einen äusserst bemerkenswerten Ertrag von 250 000 Fellen bzw. Exemplaren pro Jahr.

Es wird weiterhin eine Beschreibung der Einfuhr von Bibern und amerikanischer Bismarratten gegeben. Aufgrund des Rückgangs der Wölfe und Bären — es gibt in der ganzen Sowjetunion nur je 120 000 und 50 000 — muss der Jäger die Rolle dieser grossen Räuber übernehmen, in dem er zum Beispiel die Zahl der Huftiere in Grenzen hält.

Abschliessend eröffnet der Artikel einen Ausblick auf die Zukunft, in der die Jagd integrierender Bestandteil der Landwirtschaftspolitik werden soll, um eine grössere Vielzahl und Stabilität der Arten unter Aufrechterhaltung der Produktivität des Landes zu gewährleisten.

DIE BEBAUUNG DER EUROPÄISCHEN LANDSCHAFTEN — S 16

John Fairhall
Korrespondent für Landwirtschaft
The Guardian, London

Dem Trend zu grösseren Landwirtschaftsbetrieben, denen die kleinen Höfe zum Opfer fallen, wird durch die wachsende Zahl von Halbfarmern etwas entgegengewirkt. Es handelt sich dabei hauptsächlich um Geschäftsleute aus den Städten, die kleine Höfe als inflationssichere Investition, oder, um ihren Kindern den Aufenthalt in ländlicher Umgebung zu ermöglichen, oder, um Hunde oder Pferde zu halten, aufzukaufen. In einigen Teilen Südostenglands kontrollieren solche Halbfarmer mehr als ein Drittel des Ackerlandes und tragen auf natürliche Weise zur Aufwertung der Reize des Landlebens bei. In Schweden verfügen 20% der Stadtbevölkerung über eine Zweitwohnung auf dem Lande und in Frankreich hat sich die Zahl der Zweitwohnungen in 16 Jahren verdreifacht, obwohl in diesen Ländern noch nicht die gleiche Tendenz besteht, das noch vor nicht langer Zeit verlorengegangene «Bauernleben» wieder aufleben zu lassen.

Hauptberufliche Landwirte, die mit wirtschaftlichen Problemen zu kämpfen haben (so kostet z.B. ein Morgen Land in Belgien 911£, 454£ in Deutschland und 200£ selbst in Italien), können es sich nicht leisten, «das Land für die durchfahrenden Städte hübsch zu machen». Immer weniger Landwirte und Landarbeiter werden auf diesen Beruf vorbereitet. In Dänemark schätzt man aufgrund von Arbeitskräftemangel einen Rückgang der Gutsbetriebe von 135 000 auf 30 000 voraus. In Berggebieten ist die Situation noch ernster. Hier besteht die Tendenz, Ackerland aufzufor-

sten. In 20 Jahren werden weite Teile Schwedens mit Kiefernwäldern überzogen sein und der grösste Teil des Landes wird das Aussehen wiedererlangen, das es vor langer Zeit hatte. In Frankreich und England gehen die Hecken immer mehr zurück (in England in einer Grössenordnung von 5000 Meilen pro Jahr), um den Mähreschern auf den Kornfeldern Platz zu machen. Dadurch wird das Landschaftsbild grundlegend geändert und der natürliche Lebensraum für viele Arten zerstört. In Schleswig-Holstein werden jedoch wieder Hecken als Schutzgürtel angepflanzt. Gutsgebäude, die sich nach jahrhundertalter Bautradition in die Landschaft einfügten, werden heute durch weiltäufige funktionelle Bauten ersetzt. Der Fremdenverkehr könnte eine Antwort auf die Entvölkerung von Berggebieten und landwirtschaftlichen Randgebieten sein, wenn man verhindern möchte, dass das Land in Verfall gerät. Fremdenverkehrseinrichtung und die Ausbildung und Umschulung der Bauern als nebenberufliche Förster, Skilehrer, Herbergs- und Campingplatzverwalter müssen gesichert sein, bevor das Land völlig aufgegeben wird. Geschieht dies nicht, so wird Wald die Weiden, auf denen einst Vieh graste, überziehen und der lebenswichtige Abwechslungsreichtum der Landschaft verlorengehen.

DIE VERSTÄDTERUNG DER EUROPÄISCHEN LANDSCHAFT — S 20

Dr. E. Winkler
Professor für Raumordnung und Sozialgeographie
Bundesanstalt für Technologie
Zürich, Schweiz

In Europa zeichnet sich deutlich ein Verstädterungsprozess ab. Im Jahre 1800 lebten hier 190 Millionen Einwohner (35 pro km²), davon 20% in den Städten; 1970 war die Einwohnerzahl auf 450 Millionen (90 pro km²) gestiegen, von denen 50% Städter sind (mit regionalen Abweichungen von 30% für Albanien bis 80% für Grossbritannien). So bewohnen 70% der Bevölkerung weniger als 40% des Raumes. Im Jahre 2000 wird Europa von 520 bis 570 Millionen Menschen bewohnt sein; nur etwa 55000 km², etwa 1% des Gesamtgebietes, sind jedoch bebaut.

Diese Ballung aber hat äusserst nachteilige Auswirkungen auf die ländlichen Gebiete gehabt. Im Altertum in Italien und Griechenland und im Mittelalter in anderen Gebieten bildeten die wachsenden Städte eine Unterbrechung des Urwalds, der Europa überzog, während die Landschaft sich heute auf Überbleibsel von Wäldern inmitten von Anbauflächen mit Gehölzen beschränkt. Darüber hinaus hat die Wiederaufforstung mit fremden Arten, neben anderen Veränderungen des natürlichen Lebensraumes und der Luft- und Wasserverschmutzung, in den letzten hundert Jahren zur Ausrottung vieler Pflanzenarten geführt; so etwa 124 von 953 ursprünglich in der Berliner Gegend beheimateten Arten und 385 von 1300 im Schweizer Kanton Aargau, um nur einige Beispiele zu nennen. Ganze Anpflanzungen können Schaden erleiden. So werden in Deutschland etwa 50 000 ha Wald jährlich durch Luftverunreinigung zerstört.

Das Bild der Erde hat sich durch Nivellierungen, Ausgrabungen und Eindeichungen gewandelt. In Holland wurden 2500 km Küste künstlich geschaffen. In Grossbritannien fanden seit 1913 für Bergbau, Strassen-, Eisenbahn- und Kanalbau Erdbehebungen von 30 Millionen m³ statt. In fast allen Ländern sind durch Absinken von ehemaligen Stollen Landschaftsschäden entstanden. Entwicklungsprogramme in den Bergen haben zu Erdstürzen geführt.

Eine weitere Ausbreitung von Stadt- und Industriegebieten ist nicht zu verhindern. Diese Entwicklung kann jedoch dahingehend beeinflusst werden, dass ein ausreichender Bestand an Grünflächen gewährleistet wird, und die Erhaltung von noch nicht urbanisierten Gebieten sollte eines der Grundprinzipien der Raumordnung sein. Die umfangreiche Arbeit, die schon auf nationaler und internationaler Ebene von zahlreichen Menschen auf diesem Gebiet geleistet wird, hält die Hoffnung auf eine gesunde Zukunft Europas aufrecht.

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Ministry of Agriculture
and Natural Resources
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DENMARK

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