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Tourism and forest

The world's forests are in trouble and we, men, are of course the cause of it. Although many countries take exemplary care of this aspect of their natural heritage, the overall picture is grim and may one day cause far-reaching consequences, directly and indirectly on many activities, also politically.

With an annual increase in the human world population of some 90 million, the demand for more space, food, fuel to name but a few will rise.

In our part of the world, the new Europe, leisure activities will play an even more important role and they are extended also to forests. "Regulating" water, soil and air, providing biotopes and habitats for a multitude of species, some of them threatened, forests need all the attention and care we can spare them. To assist the experts in doing so, the Council of Europe's Centre Naturopa held its Fourth (and last) Pan- European Colloquy on Tourism and Environment in September in Warsaw on "Forests in Europe". Together with its Polish partners, the Centre Naturopa has thus drawn attention to managing Europe's forests also for leisure seekers, with the accent on continuity, safeguarding and improvement.

Naturopa 76 will entirely be dedicated to European Nature Conservation Year 1995. ■

H.H.H.

W. Łapinski

Editorial

The oldest concept of a forest is that it is a part of the landscape, wild and far from civilisation, constantly expanding its territorial possessions and indestructible. In the period of early agricultural colonisation such an understanding of the forest led to one-sided exploitation and to landscape transformation. At the time of dynamic industrialisation in the 19th century, the ability of the forest to renew itself resulted in it being classified among the renewable natural earth resources. As the forest resources drained, exploitation-oriented attitudes gave way to protective and creative ones, also favourably conditioned by the development of biology and forest sciences.

Treating the forest solely in terms of economics has recently been undermined on consideration of other than productive functions of forests, including the protective and social ones which now have been taken into account in the forestry procedures.

The manifold understanding of the forest and priorities in its functioning resulted in multiple socio-economic conflicts, since society wants to maintain undisturbed forest on the one hand and have inexhaustible amounts of cheap wood, unrestricted access to the forest and fruit-harvesting on the other.

Amongst the problems of key importance now are the relationships between pursuits to maintain the biological diversity of forests and the production of timber and satisfying the recreational needs of the society, the successful solving of which will safeguard the sustainability of forests for the benefit and delight of people.

Polish forests

Forests occupy 27.9% of Poland's surface and vary greatly in their structure and natural values. 26,000 forest complexes, both large and small, are managed by the State Forests Enterprise while 1,500,000 ha of forests belong to 1,400,000 private owners. The forest rate in individual provinces (voivodeships) oscillates between 11 and 48%. Despite the fact that Scotch pine (Pinus sylvestris) is the most common species, being frequently introduced even on more fertile sites, there is in Poland a great diversity of forest associations (about a hundred) which sometimes feature a high degree of naturalness and may be found in some managed forests too.

The most valuable natural forests have been subject to protection in 19 national parks, about 1,000 nature reserves, 7 biosphere reserves, 77 landscape parks and in more than 200 areas of protected landscape. More than 40% of managed forests are the protective forests with preferential ecological functions. The species, ecosystem and genetical diversity are of particular significance to environmental stability, to forestry and agriculture, to science and education, and plays a crucial role in the recreation of the population. Therefore biodiversity should enjoy special protection.

Since the end of the 18th century through the following 150 years, Poland evidenced continuous deforestation, mixed forests were replaced with coniferous ones, used for cattle grazing, for wood-harvesting, forest litter and faggots, thus enhancing the environmental degradation. Since 1945 the forest area has substantially increased as well as the timber resources. In addition, there has been an increase in the share of deciduous species and such practices as harvesting of litter and faggots and cattle grazing have been abandoned. However, at the same time, emissions from industrial, transportation, agricultural and urban sources have started to arrive, heavy equipment has been introduced causing noise and degradation of soils, pesticide use has increased and forest drainage carried out.

Finally, forests have been crowded by millions of tourists penetrating by car the most secluded fragments and looking for berries and mushrooms or seeking rest while encumbering each other in the pursuit. Forests, and those surrounding large and small towns in particular, have become virtually trampled down and many forest organisms have lost their habitats. Chaotic tourism, occasionally having the character of a "car-ride-alcohol" event, also threatens national parks and nature reserves despite the efforts of wardens and information services.

Tourism in Poland has been continually increasing over the last years but this growth has not been accompanied by a similar increase in the recreation facilities, despite considerable investments. Amongst various forms of forest recreation gathering of forest fruits continues to have the largest impact upon the forest environment. Despite of a series of laws laying down the principles of human behaviour in the forest and in protected areas, and notwithstanding considerable scientific, design and technical achievements, practical regulation of recreational movement leaves much to be desired, considering the unsatisfactory level of ecological education and difficulties with law enforcement.

Therefore, a compromise is needed between the population's basic rights to enjoy the forest recreation and the requirements for protecting forest ecosystems and their elements.

Poland has taken today the responsibility to host the Fourth Colloquy of the Council of Europe focusing on problems of "Tourism and Environment". During the four sessions, the participants in the colloquy have considered the importance of forests and protected areas for tourism as well as principles of forest recreation and the socio-economic significance of the latter. The study tour to sites of special recreational signifcance for Poland and for Europe, to the Green Lungs of Poland, has helped to demonstrate how attractive the area could be for international tourism, to understand the scale of ecological and recreational developments that are needed there and to illustrate how great efforts will be made in order to ensure that this pearl of European nature will not lose anything from its values when confronted with technical civilisation and touristic services. It is the foresters who will face a particular challenge here, the foresters who, guided by the Helsinki Declaration signed by the Ministers of Forestry in June 1993 and by the national policy of integrated forest protection, are striving to have a multifunctional forest, accessible for organised tourism and at the same time preserving its unique and fragile natural value. ■

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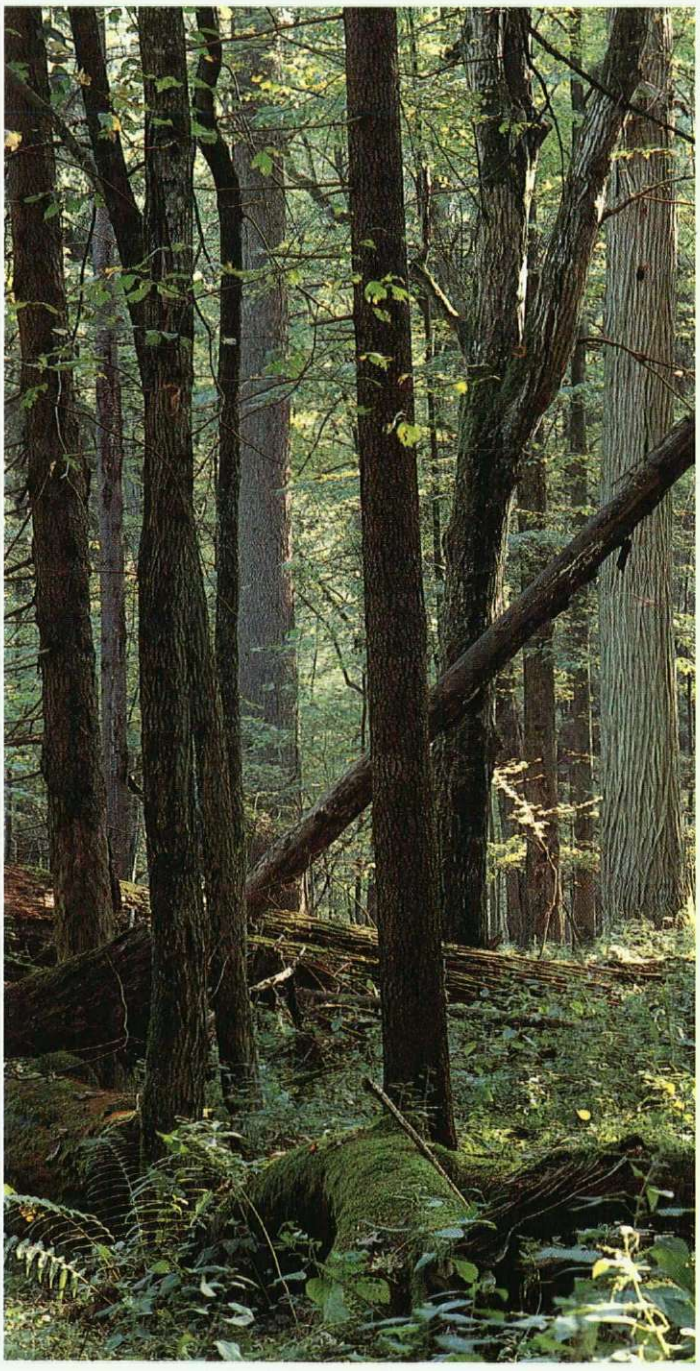

W. Łapinski

▲▲ *Flight over the Vosges (France)*

A beech has grown around a statue of Christ ▲

◀ *Bialowieja National Park (Poland)*

Walk in the Black Forest (Germany) ▼

W. Hockenjos (2)

Forests

A challenge for the city

Georges Touzet

It seems almost impossible to discuss European forests as a whole since they are so widespread and available information seems so incomplete or heterogeneous, particularly as regards the countries of the former Eastern bloc. To take up such a challenge in these few lines would be a rash undertaking if we did not limit ourselves to essentials.

The difficulty of gathering statistics

The difficulty of gathering forestry data from the states formerly belonging to the Soviet Union, as well as those within the geographical limits of the European continent, enables us to make only an approximate estimate of the size of the forest areas involved.

If we include the Baltic states, the Ukraine and Belorussia, but not Russia (since available statistics do not enable us to separate the European part from the Asian part), forested areas amount to about 195 million hectares, which is equal to coverage of 38% of the land. This represents about 5% of the forested areas of the world.

A more analytical view according to three country groups would seem to show slightly different general trends.

The whole of the European continent can be classified as part of the temperate forests which constitute a little more than half of the forests of the world (57%). Potential lumbering areas in Europe represent about 15% of the world resource in this temperate zone (estimated at 900 million hectares).

However, on closer analysis of the broad ecological types of European forests, we can establish four broad categories differentiated by the prevailing influence of climate:

- boreal forests,
- Mediterranean forests,
- mountain forests,
- genuine temperate forests.

For 1991 the yield of roundwood in Europe rose to 335 million m^3 (ie about 2.5 m^3/hectare) compared with a world yield of 3.4 billion m^3. The European Union alone yielded 144 million m^3 representing 3.4 m^3/hectare. These figures can be compared with the estimate for the organic production of exploitable forests.

These statistics show that European forests produce proportionately much more than their geographical size and would indicate that the yield of timber is much lower than the organic production. This is the result of ecological conditions which are for the most part favourable but also, and above all, because of an ancient tradition of continual forest management and the lasting development of this heritage. This is a general characteristic resulting from European history, even if important distinctions can be made along the lines set out below. It is undoubtedly true in "Old Europe" and particularly in France.

Exploitable forest areas in Europe

Groups	Forested area (millions of hectares)	Proportion of the land surface	Exploitable forest areas (millions of hectares)	Deciduous - evergreen ratio %
E.U. (12 states)	72	31	42	54/46
Central and Eastern Europe	63	27	43	47/53
Northern Europe (Finland, Sweden, Norway)	60	60	48	10/90
Europe (Total)	195	38	133	45/55

Forests, a European heritage

The history of European forests cannot be separated from the development of populations and the needs of human civilisation. They have therefore been shaped and transformed over the years and their present state is the result of changes and counter-changes which have varied according to the density of human occupation of the land.

Above all human activity has resulted in successive clearing and replanting of forest areas; but it has also played a great role in modelling the woods themselves according to the needs of the individual (land owners) or the community (public interest).

Once omnipresent, the forest was initially a victim of the development of society and then gradually was able to develop along with it. It is worth noting that this story is no different from what is happening nowadays in many places throughout the planet.

Estimation of biological production of exploitable forests

Temperate zone	2,250 million m^3 per year
Europe	572 million m^3 per year
European Union	215 million m^3 per year

Other articles in the current special issue of the review Naturopa discuss the many methods and uses which man can derive from the complex ecosystems of forests and apply to his own environment. Whilst the public has only become aware of this relatively recently, we can see that on the other hand, in its guiding principles, it is something which has been accepted (for a long time) by the foresters of "old" Europe, long accustomed to combining economic exploitation, lasting management methods and the social function of this heritage.

The modern age along with its share of new values giving rise to hope, but also sometimes to dangers, only serves to add a new chapter to this long history of links between man and his forests.

Present-day challenges for European forests: finding a balance and the need for funding

The awakening of global awareness of the advantages of forests has resulted in an impressive series of European and world events over the last ten years (the SILVA Conference in 1986, the Conferences in Strasbourg in 1990 and Helsinki in 1993, the 10th World Forestry

I. Byshnev

Congress in Paris in 1991, the United Nations Conference for Environment and Development in Rio in 1992).

This is largely the result of concerns provoked by warnings about the health of European forests after severe droughts; it also stems from acquaintance with the ravages inflicted by man on equatorial forests (over-exploitation and clearing).

It could therefore be hoped that the emergence of this international awareness may be enough to secure a long-term and stable future for one of the last natural heritages (along with the oceans) which are still in existence on the earth. This concern is accompanied in Europe, and in particular within the European Union, by a broad move away from agriculture which leaves the way clear for new planting of forests.

Nevertheless the forest manager is careful not to be naively optimistic, because his daily work enables him to look beyond noble political declarations and passing ideological whims, and see how arduous the search is for a balance between all the demands of the community vis-à-vis the forest. They include the following:

- the legitimate desire of the owner to have unlimited access to his land or, failing that, proper financial compensation;

- the demands of national governments who would like to benefit from a competitive logging industry or an injection of hard currency compensating for economic recession;

- the demands of the general public and primarily town dwellers who do not realise that their craving for the wilderness and wide open spaces is reaching certain limits and regard all logging activity as an unacceptable commercial mutilation, whilst they show no concern for the damage they may cause themselves;

- finally, the demands of certain specialist and sometimes rather opinionated devotees (naturalists, hunters, etc) who are reluctant to share "their patch".

More than ever before the forest is at the heart of economic, emotional or political issues.

It would be dangerous to think that Europe has a common experience of such issues. The following are some of the different problems it must face:

- serious problems of forest decay linked to industrial pollution of the atmosphere in vast areas of eastern Europe;

- a danger of deterioration through harsh exploitation of the fragile ecosystems of the northern boreal forests;

- in contrast, a lack of management of mountain forest or the forests bordering the Mediterranean because of structural inadequacies, leading to a high risk now and in the future of serious catastrophes (erosion, landslides, fires);

- serious imbalances between forestry and hunting in many forested areas of central Europe;

- internal economic fluctuation linked to distortions of competition resulting either from speculation on the money markets or economic recession in some countries.

Lasting forest management able to bring its many existing or potential benefits to the community at large can only be achieved through patient long-term activity. Such management implies costs which not all forest owners can take on alone because of the general irregularity of the income resulting from the only marketable products of his property (timber and game). This is the real challenge ahead for European forests. It is at the heart of the current debate on forestry policy in "old Europe", policies which can be rightly considered as breaking new ground to a certain extent. It is also moving to the core of the debates on East-West and North-South co-operation.

At a time when the French Government is launching a broad debate on regional planning, aiming to promote rural development, employment and the environment, it is difficult to see how the forest could be ignored as one of the most effective instruments of this policy. It would be interesting to compare the proportion of public spending on forests and the percentage of space occupied by forests in each country. If we put together all the taxes collected at each point along the production line of the logging business, we would no doubt find that the authorities make a profit.

In Europe forests are profoundly rooted in national culture and the collective subconscience of national populations. Their ways of managing this heritage, respecting the balance of nature, can often be presented to the whole world as an example. They provide proof that the forest is a unique environment in which economic and ecological considerations, and work and pleasure can be reconciled.

More than ever in the past, this common heritage is opening up enormous opportunities for Europeans in land use planning, economic development, quality of life, and even in education. It must be hoped therefore that states or supranational structures for co-operation will provide the financial and human resources necessary for its management. ■

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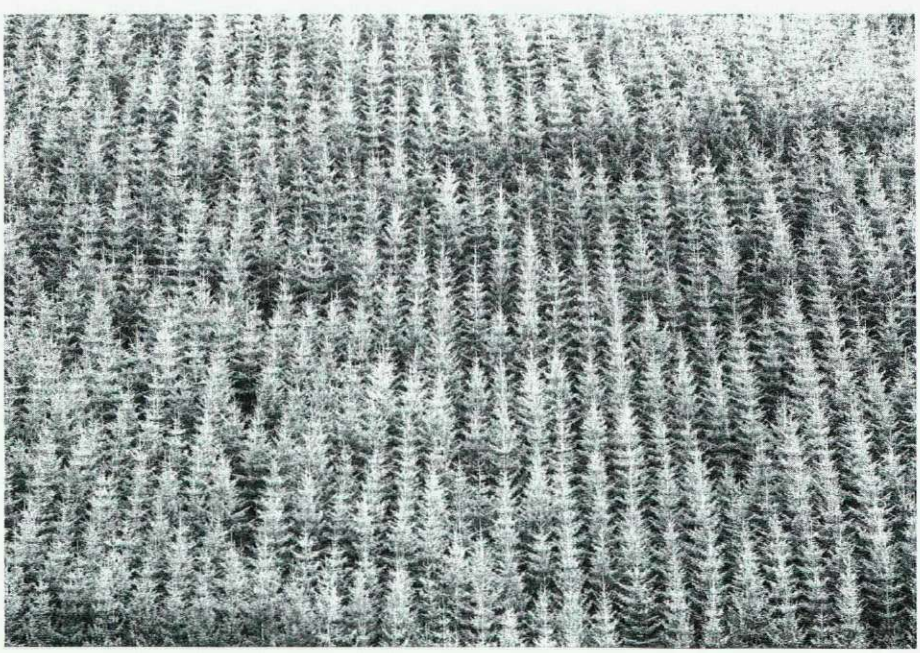
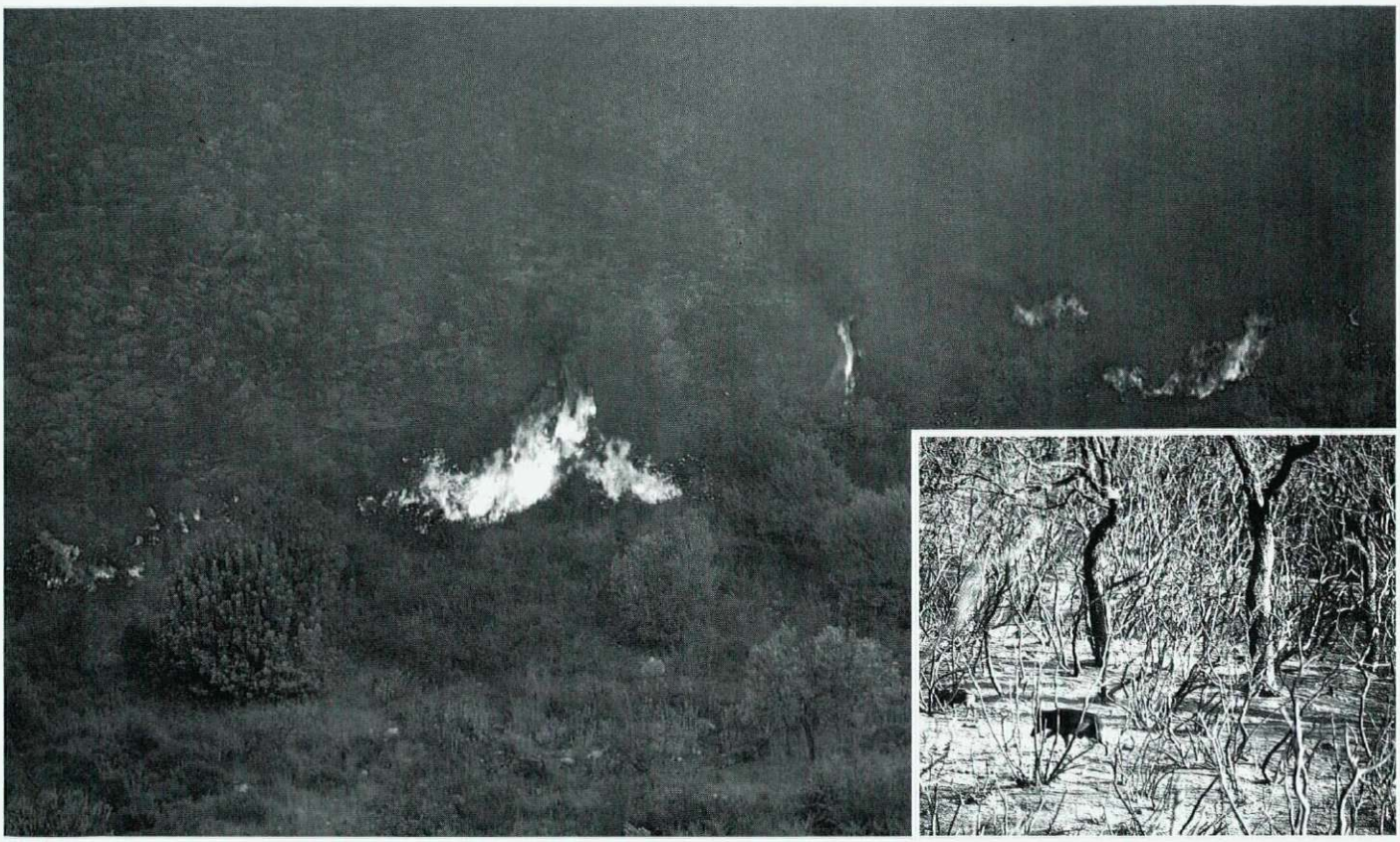


W. Hockenjos



A. Pons/Bios

B. Boisson

A political weapon?

Nikos Chlikas

The legal framework that regulates Greek forests today is part of the country's official 1975 constitution. It provides for the protection of 8,400,000 hectares of forest lands, approximately 18% of the total land area of the country, although in fact this protection is often only theoretical. In practice there are many interruptions at the expense of forests in attempts to change the use of forest lands. These have their roots in political causes as well as in the lack of a public register of lands. Thus in establishing the reasons for the increase of forest fires one has to look beyond the merely objective factors of hot summers, high winds and inflammable forests (particularly in southern Greece with its *Pinus halepensis*) to social and political factors.

If one examines the record of the last 150 years, one will note the following factors which have contributed to the decrease in forested lands:

- destruction of large areas during various wars;

- resettling of the refugees from Asia Minor (1922-24);

- conversion of forest areas to agricultural lands for the landless.

New aggressions

These factors influenced the situation up to the 1960s. Since then new destructive pressures have been at work on Greek forests, arising from the development of urbanisation and from the rapid growth of tourism. People want a second quiet house far away from the noise and pollution of urban centres, and forest areas in southern Greece and around seashore areas have been used to meet this need. As well, the decline in the collection from pine trees has resulted in a greater quantity of inflammable material being present in forests. The failure to counter these dangerous pressures and trends can be attributed to the lack of an appropriate legal protective framework, to the absence of adequate policies of land use, and to the continued absence of a register of lands.

The question still remains as to why the great forest fires have started since the 1970s. Statistics show that the great increase in forest fires have come during election periods, and at times when legal frameworks are being changed. The answer of the authorities to these problems has been to set up a fire-fighting system (fire trucks, aeroplanes and personnel) adequate to the challenge. Unfortunately, a service flexible enough and capable enough to meet all these needs on a 24-hour basis has yet to be established.

Improving the service

One could say that the problem today of an adequate fire-fighting service has three general aspects:

- political, which relates to the establishing of the appropriate legal framework and its implementation;

- organisational, which requires the setting up of a well-equipped and trained fire-fighting service; and

- economic, which demands the provision of the appropriate funds required by the forestry services.

These three general needs must be dealt with together if they are to promote a solution to the need. This service of fire-fighters must provide the trained core to which duly established supplementary forces must be added, namely local authorities and environmental organisations.

By way of a conclusion one can say that no matter how efficient a fire-fighting service is set up, there will be no final solution to forest fires unless people can be enticed to move back to forest areas.

In the past there was a steady population who lived in and around forests, and who practised professions there like resin collecting. The present depopulation of mountain and forest areas must be countered by the appropriate political and social measures. Only in this way will there be a substantial enough number of people in these areas whose occupations, interests and concerns will lead them naturally to protect the forests we all want to see preserved. ■

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Let's take a walk in the woods

Ulrich Ammer

One of the main reasons for taking a walk in the woods is to enjoy the natural surroundings. The visitor expects to find a natural-looking forest, which usually means one that is predominantly ancient (with thick trunks) and comprises a variety of tree species of different ages within a small well-kept space. Untidy primeval or relict forests are not the ones that visitors seeking relaxation appreciate most.

Naturalness and maintenance

To most people's way of thinking, a forest should be natural and unspoilt: even a forest that is known to be managed for profit is expected to leave the visitor with an impression of naturalness. Evidence of activity such as new road building, tree felling, log piling and gravel quarrying should if possible be kept hidden. In a survey prior to an exploitation programme, 60% of those questioned rated the loss of naturalness as the "worst possible consequence" for the designated area. But although a boring monospecific plantation with boundaries drawn by ruler and compass would not be considered natural, even so the ideal forest for recreation is not a jungle! On the contrary, woodland nature reserves with large quantities of dead wood are dismissed as disorderly and unsightly. In short, visitors greatly appreciate intensive maintenance provided it goes unnoticed.

Age and structure

The preference for ancient woodlands is universal: the older the trees and the thicker the trunks, the more likely it is that the forest will strike the visitor as "impressive, mighty and sublime". Few people would describe a new plantation as "a wood" or contemplate seeking relaxation there. However, the attractiveness of young stands is greatly increased if one or two old trees - survivors as they are called - subsist.

What visitors enjoy is to see several generations of trees growing together in a forest managed under a selective system. They are moved by the harmony of such a structure which brings all age groups together in a very small area (the "father-mother-child" pattern). A survey of visitors to forests in Denmark confirms this.

Blends and species

For persons seeking relaxation, the ideal is a composite or mixed forest. But the word "mixed" can refer:

- to single tree mixtures of conifers and broadleaved species;

- to different stands in alternation;

- to stands which vary in structure.

Thus different walkers have different ideas as to what a composite forest should be.

There are distinctions to be drawn, too, in people's preferences for particular tree species:

- certain landscapes are characterised by specific species which lead to particular associations in the walkers' minds: for example, blends of spruce and pine evoke the Black Forest; oak suggests the Spessart, and birch the Lüneburg Heath; beech is associated with Denmark and spruce with the Erzgebirge;

- people like such traditions to be maintained and taken into consideration;

- certain tree species - irrespective of the landscapes they evoke - are especially popular among German walkers. They include spruce, oak, birch and, to a lesser extent, beech.

That walkers' judgments where trees are concerned are not those of the forester or the ecologist, is one of the findings to emerge from a survey conducted in the Isar Basin near Munich. Although spruce is not native to the area it was, unexpectedly, highly rated. Clearly the presence of conifers belongs to the mental picture one has of the forest. The special effect produced by the presence of the colour green summer and winter is certainly another contributory factor. In this context, a study carried out in 1976 produced some interesting findings regarding the reactions of walkers to stands of practically pure spruce: these were clearly divided between:

- a marked preference;

- total rejection.

The walkers' attitudes - insofar as they were statistically significant - depended on how the spruce stands were structured. Stands consisting of trees of the same age, planted in rows or otherwise, were rejected, whereas stands that were naturally regenerating were felt to be attractive, even though they too were of pure spruce.

This finding once again underlines the significance of planning and maintenance in forestry, and gives the landowner and forester considerable freedom to select whichever tree species are technically best suited to their production and protection criteria provided they have the skill to build up a differentiated and diversified forest fabric. ■

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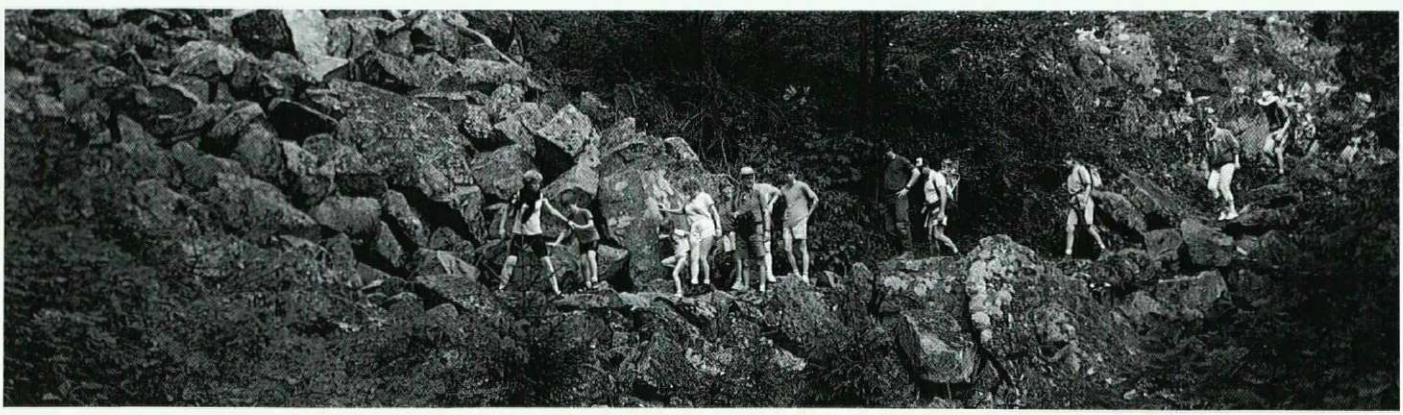
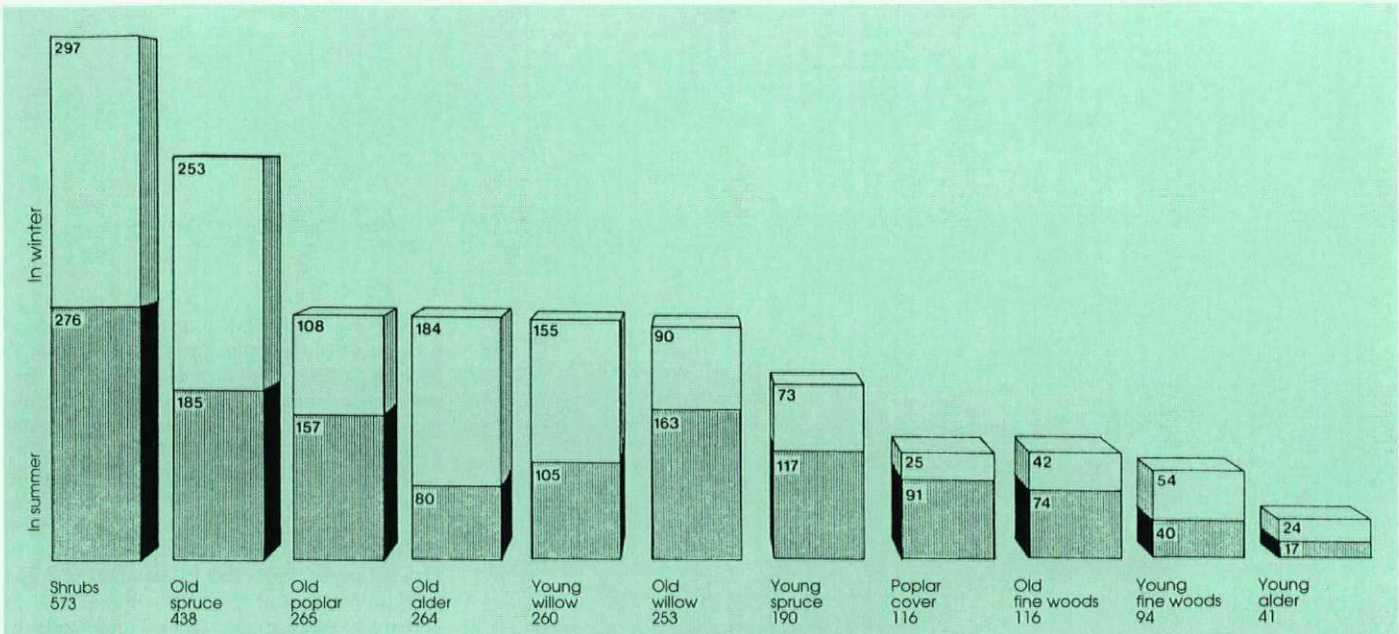


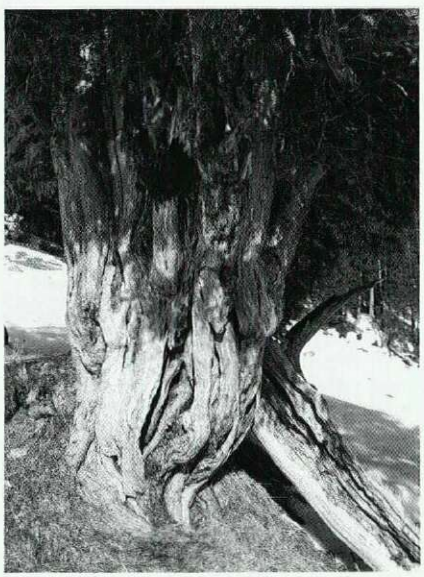
Klein-Huber/Bios



Evaluation of perception of type of forest plantation in a wet forest near Munich (young forests being denser than old ones)

The yew (Taxus baccata) has been named "Tree of the Year" in Germany. This Austrian specimen may be more than 4,000 years old. It is perhaps the oldest tree in Europe.

W. Hockenjos (2)



Bear tracks

I. Byshnev

In Germany

Peter Dietz

This is a time of severe economic crisis for German timber production.

It is partly the crisis affecting the primary sector in any modern industrial society: owing to low commodity prices and high wage level, many commercial forests are no longer able to show a profit.

But it is also an ecological crisis: forest die-back, storms and the bark-beetle have inflicted deep wounds. A reorganisation of the forest on ecological lines is called for. Increasingly, conservation groups are demanding a say in the management of the tree farming economy. A further crisis threatens now that landowners and foresters are aware of growing opposition to the central European tradition of intensive forest maintenance.

This situation calls for a twofold remedial strategy:

• Profitability must be stepped up partly through better market conditions for wood as a renewable raw material and partly through rigorous cost control.

• The community must recognise that the forest ecosystem is indispensable and must help maintain its productivity by providing landowners:

- with compensation for the damage caused to the forest ecosystem by present-day industrial pollution;

- with remuneration for the many public services which the forest ecosystem provides;

- with assistance for their own long-term ecological transformation projects. ■

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Wood has always been essentiel to us.

Vital space

Peter Glück

A forest is not just a part of the landscape or a setting for legends and fairy tales: it is a place where plants and creatures live and a provider of many of life's necessities for numerous generations of human beings. The development of our culture and civilisation would not have been possible without the destruction of the forests; burning, clear felling and arable cropping were chiefly to blame. Unlike the situation in the developing countries, this development has more or less come to a halt in Europe. Today, according to the latest United Nations statistics, woodlands account for some 27% of the surface area of Europe.

Over half of Europe's woodlands belong to private landowners who rely on the exploitation of timber for a portion of their income. State-owned forests, too, could not be maintained without the revenue from timber sales. Wood is by far the most important source of income to be derived from forests. Hunting and other forest "by-products" such as mushrooms, berries, nuts, honey and Christmas trees, come a long way behind. Even so, these products enjoy considerable status in a number of European countries.

Exploitation without overuse

Despite the importance of timber production, Europe's forests are not overused: the volume felled is less than the sustained annual growth. This is due partly to the market situation and partly to the forest conservation and improvement policy which has been in place for many decades. This policy is of paramount importance in view of the inestimable role that wood has in the context of the declared worldwide aim of sustainable development; for being a renewable material, its importance will increase as the non-renewable resources run out.

In each European country, the contribution of forestry to the gross domestic product (GDP) is well below 1%; but this indicator does not do justice to the genuine economic importance of forestry. In structurally weak rural areas, it is one of the main job creation sectors and supplies the saw-mills, wood-panelling factories and paper mills with raw material. Taking the whole forest economy into consideration, including the timber processing industry, the contribution of these activities to GDP is by no means negligible: in Finland, for example, it is almost 9%. Then there is the spin-off which benefits the engineering and related industries, with the result that in some European countries, including Finland, Sweden and Austria, the forestry "cluster" is one of the leading economic sectors.

What forests have to offer

Of the various uses to which forests can be put, the most obvious in the countries of Europe is timber production, followed by hunting. But forests are also useful to the community in other ways which make no money for their owners: these include recreation, defence against floods and avalanches, grazing, and the means of regulating the water regime, improving water quality and conserving biological diversity. For a long time, most of these functions were thought to be compatible with timber production, but nowadays conflicts are more and more common, notably with hunting, tourism, disaster prevention and nature conservation. The worst possible course would clearly be to turn forests into dumps for polluting waste. The ministerial conferences on the protection of forests in Europe which took place in Strasbourg in 1990 and in Helsinki in 1993 set out to find solutions to these problems. In Helsinki, 34 European states undertook to manage their forests in a sustainable manner with the emphasis on preserving biological diversity.

The way forward

There can be no doubt that the services provided by the forest economy will assume increasing significance in the years ahead. Where private forests are concerned, endeavours to legislate have led nowhere. Landowners are not philanthropists and cannot be expected to pay the cost of providing services in the public interest. Economic incentives are needed which, depending on the type of service, could take the form of state aid or be of a profit-making nature. The latter can be contemplated only for activities which are in some way exclusive, such as mountain bike rallies or group visits to national parks, which appeal to a minority. On the other hand, where services in the public interest are concerned, such as disaster prevention and landscape preservation, the state must as a rule step in with financial aid. Striking a correct balance between state aid and free enterprise incentives as instruments for achieving sustainable forest management should be the principal aim of European policy from now on. ■

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Landscape perception

Javier Benayas del Alamo

Increasing numbers of people leave the big cities at week-ends and during holiday periods and head for the mountains, forests, rivers, beaches and other open spaces. For many people undertaking such journeys, often over long distances, the aim is to make direct contact with the natural environment through the medium of recreation. But their activities often have a discernible impact, direct or otherwise, on the ecological value of the places they visit.

There is a close relationship between certain visitors' aggressive behaviour towards areas of natural beauty and the manner in which they perceive those areas. Perception is not only a process of gathering information on the environment through the medium of the senses: it also comprises a phase of unconscious value judgment. On the one hand, the person creates a mental image of the landscape he is contemplating, and on the other he reacts emotionally to the landscape with admiration or dislike. It is this emotional reaction which will later help to determine the person's behaviour towards the environment.

Our team, led by Professor Fernando González Bernáldez, has been working for some years on this form of aesthetic landscape evaluation. The aim of our research is to define the principal dimensions of people's preferences or "tastes". These dimensions can serve as a scale by which to evaluate attitudes to the landscape or to find correlations with socio-cultural variables. For this, various methods of inquiry are used, based on an analysis of preferences in regard to paired images of various landscapes.

Basically, these studies reveal the existence of a general consensus among populations of different cultural backgrounds in favour of landscapes where well developed green vegetation is strongly in evidence (in particular trees), and for sectors featuring water (especially if it is clean and limpid or if it is fast-flowing with weirs and small waterfalls). Places of this kind normally coincide with the main centres of attraction where tourism and recreation tend to be concentrated.

Attraction and repulsion

This emotional predisposition to "phytophilia" and "hydrophilia" may be explained in terms of the relaxing and tranquillising effects which vegetation and water have on individuals. These effects are discernible especially among town-dwellers who are subjected to severe stress every day of their normal lives. Another possible interpretation of these landscape preferences may be sought in the innate predisposition of the human being to select certain habitats or environments which bring together the resources and conditions best suited to survival.

In addition to these landscape features which everyone appreciates, there are other visual characteristics to which different observers attach different values. One of the most common conflicts encountered in these studies of perception lies in the attitudes that landscapes engender according to whether they are orderly, cultivated, well kept and generally manmade, or wild, uncultivated and unkempt. The former are perceived as controllable, comfortable environments in which one can fend for oneself in perfect safety and without risk, while the latter are seen as stimulating, an incitement to exploration and adventure.

Our findings point to a link between these conflicts in the appreciation of a landscape and various individual characteristics. Where age is concerned, children under about 15 years of age and adults over 35 - including the elderly - clearly tend to prefer the better-kept places. On the other hand, young people between 15 and 35 tend to prefer the wilder areas, which present more challenges. Global differences are also discernible depending on the subject's sex, especially among children. As a general rule, females appear to be in search of security in orderly, welcoming places, whereas males look mainly for adventure in landscapes which provoke curiosity, where the vegetation is dense and the shapes aggressive.

Attitudes and behaviour forms

This polarity in landscape perception is clearly reflected in the attitudes and behaviour forms which tourists display in the places they visit. It may help to distinguish two major trends in the practice of tourism. At one extreme there are those who cannot enjoy nature without altering it and adapting it to their needs, in order to make it more welcoming and easier to live with. These are mostly persons who demand more facilities and equipment and have little sense of a place's visual charm. At the opposite extreme there are visitors who seek to stimulate their physical or intellectual capacities by confronting challenges and penetrating the mysteries of nature in the wild. These are adventurous individuals who cannot bear the landscape to be encumbered with installations or manmade features and adopt a form of behaviour which is both respectful and responsible in their interactions with the environment.

The landscape as a "visual and scenic resource" is what prompts the community's increasing demand for tourism recreational and tourism activity. There is clearly an important economic resource here which could well make the ecologically sustainable and socially acceptable development of the countryside a feasible proposition. The aim should therefore be to put the countryside first and endeavour to modify the perception which many visitors have of it and their invasive list conception of enjoyment. ■

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Water and forest. What could be more restful?

B. Boisson

Hunting tourism in Hungary

Mátyás Kovács

In relation to the issue of practising hunting rights, the situation evolved before the change of regime in 1990 has survived in Hungary (in want of legislative regulation). Accordingly today hunting rights are due to the state on the whole territory of Hungary.

The state asserts the hunting rights in two ways:

- either utilises it in own operation through state entities (18% or 1.7 million hectares);

- or leases or cedes it to hunting societies or to their associations (82% or 7.6 million hectares).

Until recently 170 such state entities and 800 hunting societies were operating. In the country there are nearly 46,000 (Hungarian) hunters. The number of hunting tourists arriving from abroad fluctuates between 20-25,000 annually.

The inland stock of game, on an estimated basis, shows the following approximate figures according to the most significant big and small game species. The interdependence and relationship of the data connot be examined, partly because of the well-known shortcomings and insufficiencies of estimations in the field, partly because the number of authorised culls is raised in accordance with increase in game populations.

Game habitat

The success of deservedly famous Hungarian stock of game can be found in the favourable ecological conditions of the Carpathian basin (particularly in the quality of habitat) as well as in the purposeful positively directed selection. That is why the protection of advantageous habitats, the reconstruction of deteriorated ones or the creation of new habitats is of such particular importance.

The extension and quality of forest areas is determinant for big game in Hungary. 18% of the territory of the country is covered by forests, which corresponds to 1.7 million hectares. That is rather low even in European comparison. A further difficulty for the wild forest animals is the fact that hardly half of these forests are in a near-natural state, and artificial forests are not natural habitats of indigenous Hungarian forest game species.

With the expansion of agricultural areas the natural conditions have changed. The over 6,000 hectares agricultural area also should be regarded as game habitat, because of the agricultural products favourable for them.

Thus together with the wetland habitats (reeds, marshes, wetlands) more than 8 million hectares might be regarded as hiding, feeding, breeding, resting areas of game.

In a densely populated country that size of area might be qualified as favourable for hunting tourism.

For future hunting tourism the conservation and creation of ecologically stable habitats with diversified, rich wildlife are of significance.

The tourist attraction of Hungarian game

For representing the tourist attraction the red deer, also named as the "royal game" of Hungarian forests, is the most appropriate. Nearly half of the European medal-winning (gold, silver, bronze) antlers originate from Hungary. By examining the data for five years of the same game species, it can be found that 48-57% of red deer antlers presented for trophy judgement were awarded with medals. The above data verify the unique attractiveness of the Hungarian stock of game.

Hunting tourism and nature conservation

The exaggerated profit-oriented hunting requires hunting grounds with "adequately" oversized game population. However the large game population destroys or heavily damages the natural environment (primarily vegetation and soil), but also results in impairing the quality of the stock of game. That is the main reason of the conflict between hunting tourism and nature conservation. About 700,000 hectares under legal protection - with the exception of six specific smaller areas - are also involved in hunting tourism and it is another source of considerable conflict. Relations were further impaired when a specimen of a species disappeared from Hungary, but re-migrating from neighbouring countries were killed (bear, wolf, lynx).

Opinions are different concerning the introduction of non-indigenous species, the damage caused by predators and in respect of intensive game breeding too.

In recent years, however, we are experiencing the rapprochement of hunters toward nature conservation which is due to:

- the international trends;

- the change of attitude;

- the scientific verification of ecological principles.

Estimate of population and annual culling of some game species

Species	Population	Culling
Red deer	54 000	29 000
Fallow deer	190 000	7 000
Roe-deer	280 000	38 000
Moufflon	9 000	3 000
Wild boar	44 000	43 000
Brown hare	590 000	127 000
Pheasant	830 000	537 000

J. Barbery

Likely problems

In Hungary in recent decades the expanding game population, profiting from the effect of continuously improving habitat features, has brought along such a qualitative evolution that is unprecedented (e.g. in the case of our most important forest game: the red deer). It is estimated that the Hungarian stock of red deer was at its peak in 1989, since then it has reduced considerably. Given that the population increase occurred during 25-30 years, its reduction also should be carried out at a slower pace than today and only through a deliberate and careful selective decrease, similar to natural selection.

The drastic cullings lacking any professional consideration are incompatible both with the management of natural resources, regarded as national wealth, and with the principles of nature conservation. In such a case it might happen that the quality of certain stocks of game which are indeed overpopulated today, shall be irreparably damaged or might be restored only after a very lengthy period. That would render impossible even the potential of qualitative hunting tourism which is pointed out as the road of future.

Foreign hunters

The foreign hunting tourism aimed at shooting/killing game of outstanding quality even in European relation, is facilitated by the respective legislation.

Hunter-guests are entitled to bring along hunting arms and ammunition for the purpose of participation in hunting on the territory of Hungary (up to 90 days residence), if they have a valid permit for gun and ammunition. This permit can be requested in advance at the competent Hungarian foreign representation - or in want of such - at the border. Thus the hunter can clear the gun(s) and ammunition at the border customs office. For taking out the trophies of killed game the endorsed invoice issued by the holder of hunting rights and a customs document are required.

Due to accelerated and facilitated clearance formalities, hindrances or claims only seldom occurred when entering or leaving at border stations

Revaluation

A trend might be observed all over the world, that hunting is less regarded as a sport, trophy, game-meat and hide yielding activity or a production branch providing tourism-income. Also in Hungary the viewpoints of nature conservation are gradually coming in the foreground.

Nowadays a significant part of the hunting society admits that the huntable animals of the wilderness are elements of the natural community. They are professing further that ecological and nature conservation considerations should be determining. A too big stock of game threatening the ecological stability of habitats and exceeding by far the natural game supporting capability is harmful to the quality of population, genetic reserves of certain species and in addition is considerably damaging to botanical and zoological values.

The recent revaluation of the approach towards hunting and game management is in correlation with the awakening of ecological awareness and the increase of nature conservation culture.

The interpretation of game management as mainly production and profit oriented branch is probably relegated to the past for ever.

And that trend should be followed by the revaluation of hunting tourism.

To stake out the new directions of Hungarian hunting tourism in detail still would be premature today, however in its entirety already might be prognosticated. According to that, Hungarian hunting tourism, building on the example of the so-called soft or ecotourism should progress in a way to put the least burden on nature, to best harmonise with it, and

to make least intervention in the natural processes.

That trend of hunting tourism in no way can be by-passed if we want to hunt in the long run, with success, and in a natural way.

In the future

Hungarian hunting tourism, having a remarkable past and significant results, is expected to go through considerable transformation due to the ownership changes and restructuring of hunting following the change of regime in 1990.

In respect of the revaluation and reform of hunting tourism within the country, the increase of game population is a non- practical way because of the conflicts set out before. Thus the question arises: how could the increase of hunting potentials, regarded as a natural demand, be resolved without the growth of game population?

Taking into account the favourable inland conditions, the increasing demand for hunting tourism might be met satisfactorily only by turning toward "hunting tourism of quality".

In order to improve the quality and raise the level of hunting tourism the following opportunities might be utilised and conditions are required, respectively:

• quality stock of game:

- habitat improvement;

- proper outshooting of specimens, simulating natural selection;

- stock of game of adequate quantity, with proper ratio of sexes and health status;

- natural game keeping;

• favourable natural and landscape environment;

• increasing the level of organisation of hunting;

• improving the aesthetic, cultural, and comfort level of hunting tourism establishments;

• the art of catering;

• ethical hunting business management based on Hungarian hunting traditions;

• introduction of related programmes (cultural, hiking, sports, etc.);

• hunting in game-reserves;

• observation of nature, and photo-safari programmes;

• ensuring emotional and aesthetic attraction;

• human relations, aspects;

• promotion.

By establishing or improving the above conditions it might be expected that the long-time good reputation of Hungarian hunting tourism will be maintained and developed. ■

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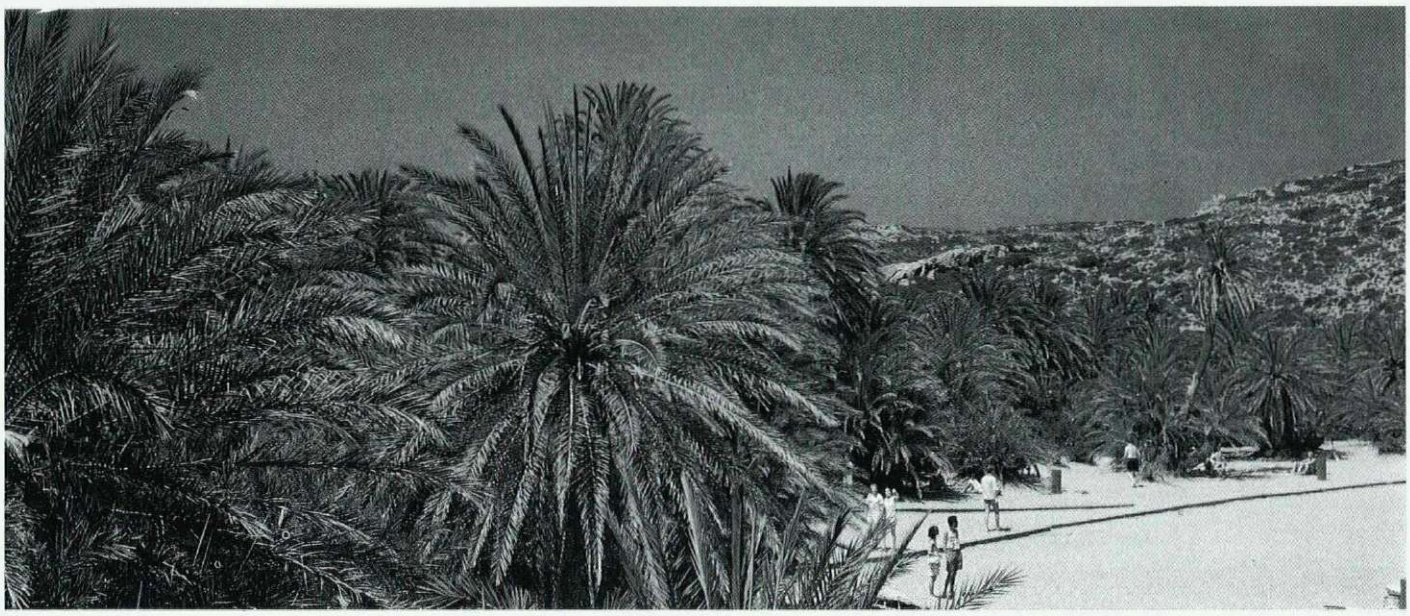

R. Oldeman

The only European palm-grove is at Vai in Crete.

Sustainability
Caring for forests

Roelof Oldeman
Jari Parviainen
Karlheinz Stephan

There is no single form of European forest, rather, there are hundreds of different varieties across the continent. Europe's last indigenous palm grove is in Crete, a fact of which tourists bathing in the adjoining Mediterranean are unaware. Nor do locals realise that this small forest is an ancient natural and cultural treasure trove. The fact is that the palms, cousins of the African date palm, have been there throughout their lifetimes.

This Cretan palm grove has felt the impact of humans for at least three thousand years. It probably owes its survival to the fact that *Phoenix theophrastii*, the species' Latin name, offers nothing very useful. Its dates are inedible and its wood is valueless. At best, its leaves offer shade. The sandy soil in which it grows is so poor that it is not worth the effort of clearing it for agriculture.

Today, the palm grove forms part of the tourist "infrastructure". It is profitable. However, as soon as this infrastructure becomes capable of supporting even more profitable activities such as hydroponic vegetable or fruit growing, the palm trees will be cut down.

Primitive treatment or forests as mines

The ancient continent of Europe contains ancient forests. For 12,000 years - since the retreat of the glaciers - these forests have gradually invaded Europe from the south. Humans followed this movement, taking what they needed from the forest: fruits, leaves and animals for food, wood for making fire, supple young trees for weapons and huts. Forests, even the steppes of that time with their few scattered trees, were a mine of timber, skins and food supplies.

Mines are areas of exploitation where sustainability is irrelevant. When they are exhausted, those concerned migrate to new sources. While a few rare forests of no direct value have survived in the warm, hospitable south, elsewhere in Europe the treatment of forests as mines entered a new phase at least 3,000 years ago. Even with a sparse population, people's needs could no longer be met from the original forest.

The intensification of production now involved "mining" the very soil of the forest. Nomadic agriculture was practised on this deforested land, with the farmers migrating to new fields whenever their existing ones became exhausted. This form of mining of the land still leaves its mark.

Soon all the land was populated and unoccupied fields were no longer to be found. Agriculture became sedentary. Each harvest represented a fresh clearing of the same land, which had to be made productive every year to ensure survival.

Thus, right across Europe, human pressure on agricultural land increased - as it did on the remaining forests, exploited for all the products which the fields could not supply: wood, game, mushrooms and medicines. Today, traces of this treatment of forests are still to be found in regions which have never been very densely populated, such as certain mountain landscapes in the Pyrenees, the Balkans, Wales and the Alps.

Such landscapes also exist along the great European rivers - the Rhine, the Danube and others. These rivers often form national frontiers. Their banks have been relatively thinly populated because of the risk of battles. They are sprinkled with fragments of semi-natural forest. Nowadays, they are the subject of political battles between developers and conservationists.

Agricultural treatment or the forest as a sustainable field

However, there were new pressures on European forests. Even in the Roman era, the Mediterranean region was largely deforested. Forests were decimated to meet the needs created by urbanisation, fleets, armaments and heating for baths. This period has left its traces all around the Mediterranean. The pioneer character of the majority of forest ecosystems - hence their vulnerability to fire - is partly the result of this. Wood and other forestry products were now obtained from what were effectively farms rather than the traditional forest. The aim of agricultural sustainability is to produce regular harvests.

Farmed forests were either coppices or coppices with standards. In the Empire of Charlemagne and the present United Kingdom they remained the dominant form of agriculturally treated forests until the industrial revolution. Coppices or their remains are to be found around the trunks of great trees. They were cut back to ground level every eight to 40 years and threw out new sprouts each generation. The thin shoots

R. Oldeman

Old coppices with standards not entirely conserved now exploited for firewood.

were used as poles and handles, for weaving walls or as fuel. The bark from copses of oaks supplied the tannin used by tanners.

Coppices with standards are obtained by sparing sprouts, in order to produce timber. The tops of the trees overlook the simple coppice, with their trunks forming the standards. This form of treatment is still easily recognised. Large branches, often dead ones if the most recent treatment was a long time ago, appear on the trunk some four metres up. This was the height of the coppice below, which by the present day has often disappeared. If this attractive type of forest is to be retained for tourist purposes, this form of treatment must be continued or recommenced.

Coppices and coppices with standards have survived in areas of extensive agriculture where population density is not too high. Attractive landscapes containing such forests, to a greater or lesser extent abandoned, are to be found in the south-west Netherlands, eastern Belgium and Luxembourg, more rarely in France and in rural England, north-west Germany and the east of Denmark. Such treatment is no longer carried out for the purposes of production.

In central Europe and to some extent the Iberian peninsula, the agricultural treatment of forests had a different origin: livestock. Wherever the cleared fields could not feed the animals, they were put to pasture in the forest. The composition of the forests was modified as a result. The animals' favourite small plants could not regenerate and their preferred trees - oaks for their acorns - were grown by the farmers. Farmers also used the forest's bed of organic material to line the stable floor.

Such practices often impoverished the soil to such an extent that a real desertification process took place. Such land is recognisable by its barrenness - wind-driven sand or heathlands in south-west France, the central Netherlands and northern Germany. In the Mediterranean area, ericaceous species similar to the northern heather, groves of scrubby oaks in the maquis and eroded slopes are all signs of past abuse. Today, many of these areas have been restored by planting forests, for example of pine.

Elsewhere, farmers have found more elegant solutions. The Iberian *dehesa* or *montado* combine open commercial cork-oak forests with livestock farming. "Agroforestry" is the term currently used to describe such mixed systems. These plantations have as little of the atmosphere of forests as olive groves or orchards. Further north, peasants who jointly own or enjoy the use of village, municipal and other communal forests have developed extremely subtle forms of cutting, a genuinely ecological type of treatment which is considered below.

Industrial treatment or sustainable supplies of wood

The 17th century saw the first wave of European industrialisation, plus trade and war on an unprecedented scale. In the Black Forest, giant, upright spruces were sold as *Holländer*, or Dutchmen - a reference to the masts of the sailing ships of the United Provinces which criss-crossed the oceans. During this period, the French minister Colbert ordered the planting of forests to produce masts for the 20th century French navy! Barely 50 years later, the notion of sustainable forests began to emerge, in response to the threat of a shortage of timber in Europe. Stocks had already been ravaged by the 30 and 80 Years' Wars and other 16th century excesses.

Hans Carl von Carlowitz introduced the notion of durability in 1713 in his book *Sylvicultura Œconomica*. The writer was passionately committed to the preservation of Europe's supplies of timber. He therefore advocated the production of wood on a lasting basis, while expressing, as a Christian, his admiration for the marvels of nature. In fact the German term *Nachhaltigkeit* more or less signifies "keeping something in reserve". The current, widely-used English word *"sustainable"* does not mean "durable" but rather "capable of being maintained at a certain level". It refers not to "that which lasts" but to *"that which we want to last"*, in other words selective durability.

The aim was to ensure continuing fresh supplies of timber for production linked to industrialisation. The market did not require so much wood in small quantities, for example single trees for building individual houses or carts. Instead, the demand was for large quantities of timber of varying degrees of uniformity. Industrial production encouraged large-scale forestry. This involved the clear felling of large areas, followed by immediate replanting or sowing for the monoculture of fast growing species. Such systems developed gradually between 1713 and 1860 and then flourished over the next 100 years.

Of the various forms of forestry, high forests became the most important. Unlike coppices and coppices with standards, the *Hochwald, futaie* or *opgaand bos* is not produced from sprouts. High forests originate from seeds, either by natural *regeneration*, when the seed bearing trees left in place themselves drop seeds, or by *artificial regeneration*. In the latter case, it is man who sows the seeds or plants the seedlings from his nursery, often exotic North American species - Douglas firs on the continent and sitka spruces in the British Isles.

The French forestry code offers an illustration of sustainability: since 1827, it has provided for the *transformation* of coppices and coppices with standards to high forest. A century and a half later, this objective had been 75% achieved, and there have been new plantations as well. Many forms of treatment have emerged to ensure the desired development of high forests, from their initial establishment to final cutting. Their range is enormous. The 1982 forestry handbook produced by H. J. Mette and U. Korell deals with dozens of natural regeneration processes for high forests, with all their complications, in more than ten pages of very detailed forestry tables using very small lettering.

More than a century of this sort of treatment has made high forests the most common type in Europe. Pine forests ranging from Greece to Finland, rural poplar groves in the west and forests of birch in eastern Europe, groves of beech and oak from Denmark to Italy and the southern Slav countries, vast areas of spruce from Finland to the Alps and on to the Pyrenees - wherever they go, and as much by accident as by design, tourists come across high forest. They exist throughout Europe, to the extent that nearly everyone believes them to be the natural form of forest.

Ecological treatment or sustainable forests

Natural forests are in fact very rare in Europe. In every country, forests bear the imprint of human intervention. Even the highly inaccessible Austrian *Wiegenwälder* have occasionally been penetrated by cowherds and wood-cutters.

Coinciding with the industrial revolution came an idealised conception of nature. The Fontainbleau nature reserves date from the

R. Oldeman

The mixed beech forest of Suresup (Denmark), now protected, has been a "virgin forest" for the last two centuries.

18th century French kings. The following century saw a blossoming of private reserves and parks, many of which remain in existence to this day. The Neuenburger and Hasbrucher *Urwälder* (primitive forests) in Germany are nearly 120 years old and the "virgin forest" of Suserup in Denmark nearly 200, while the Czech and Slovak nature reserves were first introduced in 1838.

In these cases, sustainability implied an absence of humans. Today, total protection against man is still often considered to be the sole form of treatment which can guarantee forests' durability. Tourists often dislike natural forests. Such forests die and then grow again in small clusters of trees, forming a chaotic mosaic of dead wood, tangles of young trees, shrubs and brambles or honeysuckles, fully grown adult trees and other large but very old trees which are hollowed and scarred.

Certain European action groups oppose this approach. Town dwellers would like to see well manicured forests with no risk from falling dead branches - in other words regular high forests. Country dwellers often suspect natural forests to be reservoirs of rodents and plant diseases. Nevertheless, the last 25 years have seen the emergence of a popular movement in support of natural forests. One powerful motive has been the disappearance of tropical rain forests, a trend which is still gathering speed.

At the same time as the biological agricultural movement of the early 1920s, Swiss foresters were advocating an ecological approach to their work. They had some illustrious predecessors in France and Italy but these were figures with almost no following. Although other foresters initially dismissed them as dreamers, the Swiss found support in central Europe and in what we now call the Benelux countries. Ecological forestry in Europe, as represented by the Pro Silva Association, is now thriving more than ever.

While the primary objective was to sustain the forest, this did not preclude its exploitation, on condition that all other applications were secondary. Lasting supplies of timber, financial considerations, forestry employment, productive land use and tourism were all subordinated to the forest's continued existence. What forms of treatment would permit such sustainability?

Scandinavia provides one very unexpected example. Whereas in the Mediterranean region, fire fighters struggle to prevent an increase in the 600,000 ha of forest which are burnt down each year, the Finns use fire as a form of treatment close to nature.

The extensive forests of Europe's far north are regularly swept by natural fires and terrible northern storms. The fire prepares the soil for new generations of trees. The Finns therefore imitate the natural forest by clear felling what they consider to be small areas of up to 10 ha; this is followed by fire or some other treatment of the soil.

Elsewhere in Europe, forests die and regenerate tree by tree, or in small groups. Peasants are aware of this. They have always taken their timber from the municipal forest one tree at a time. They are also *imitating nature*. As practised by foresters who are *close to nature*, this form of treatment results in a high forest with numerous patches of trees of different ages. Slovenia is a spectacular example of this. Since 1946, the Forestry Act has prohibited clear felling. To the north of Ljubljana, only felled trees are to be found, not felled forests. Forests treated in this way also exist in central Europe and the Pyrenees, but this treatment is often neglected since it has not been possible to harmonise its economics with the commercial and industrial world of the late 20th century.

Future treatment for sustainable development

As the 21st century draws near, this is the challenge facing Europe's foresters. The objective of sustainability must now be seen in a social and economic context. Forests must be sustainable, even if the price of timber does fall, even if cities and industries do bathe them in pollution, even if industrial agriculture does suck water from the soil, even if GATT does change global economic conditions from one instant to the next.

Far from being a purely technical operation, forestry must take account of new social trends if Europe's woodland heritage is not to be eroded. This was the great achievement of the foresters of the past, the inventors of agricultural, industrial and environmental sustainability. However, yesterday's solutions do not provide an answer to today's problems.

Foresters are increasingly explaining their forests, their problems and their solutions to the public, and listening to what society has to say. This article describes the treatment of forests and what visible effects this has. Foresters monitor their forests through observation and measurement. Their diagnoses are based on first-hand experience and scientific knowledge. Environmental and economic indicators make these diagnoses credible to decision makers, managers outside the forestry field, journalists, visitors of all shades and the general public.

Since Rio, sustainable development has called for an unprecedented degree of flexibility in the care of forests. Society is developing much more rapidly than its forests. However, these forests must endure. Three promising avenues exist.

Firstly, the *multiple use* of forests offers, at one and the same time, recreation, biodiversity, timber and protection against flooding, as in the Alps. Such forests have no enemies and many friends. The second approach is to *invest less per hectare*. Cheap forests do not accumulate the financial burden of long-term debt but they do accumulate animals, plants and timber which will be of great value a century from now. The third step, still a controversial one, is to abandon *target-based* forestry plans in favour of *the planning of processes*. This will enable foresters to satisfy the demands of society without posing a threat to our forests' continued existence.

These new forms of treatment for European forests offer future towards the pleasurable prospect of seeing nature thriving; at the same time they will ensure that forests are useful. ■

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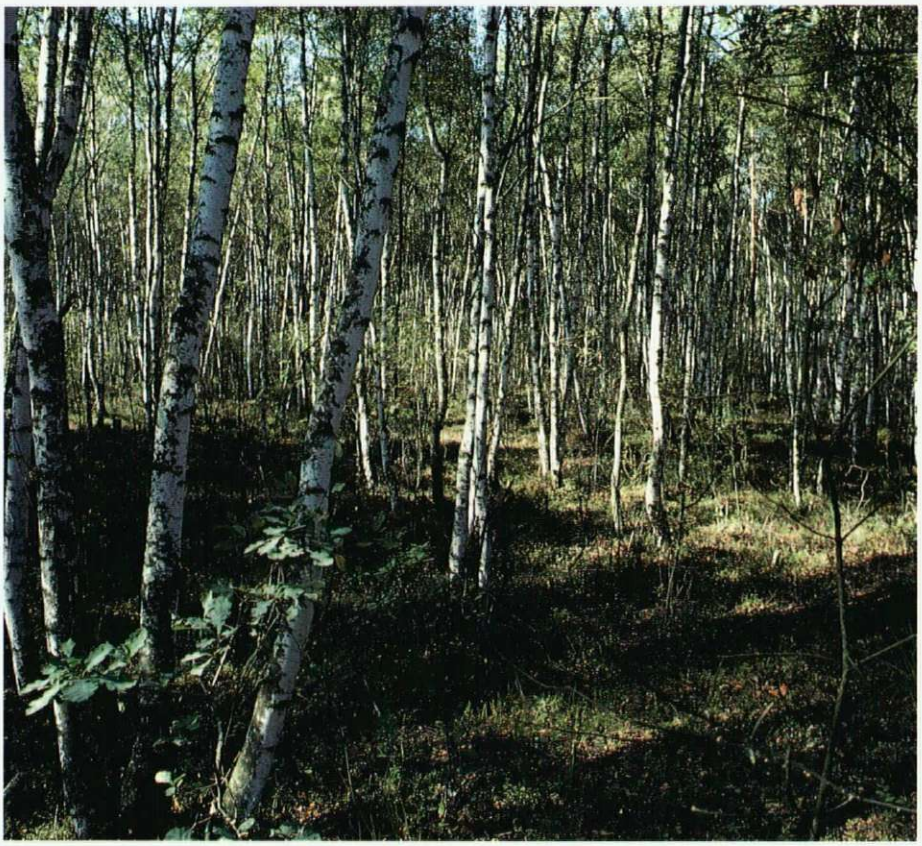

R. Humler

J.L. Ermel/Bios

The elk, symbol of the Park, sometimes wanders into Warsaw's suburbs.

A national park at the city gates

Jerzy Misiak

The Kampinos National Park was founded in 1939, for the purpose of nature conservation and the protection of historic and cultural objects in the Kampinos Woods. The latter is about 35,000 hectares and is near Warsaw. It covers part of the primal Vistula valley in the Warsaw Basin, on the Mazovian Lowlands.

Characteristically distinct features of the Park's nature are complexes of inland wooded dunes and parallel peat bog and wetland belts, including woods, sedge habitats and meadows. The Park can boast of a rich realm of plants and animals. It also functions as the green lungs of Warsaw. Within the Park and its buffer zone, there are numerous historic objects from the different periods of the history of the Polish nation and state including architectural monuments. They include strongholds, palaces, manors, churches, battlefields, tombs and graveyards.

Natural significance

The Kampinos National Park is situated in the largest national water node as created by the valleys of the Vistula, the Bug and the Narew whose confluence comes at this point. It is a nodal element of the large-space system of protected areas in central Poland. It is connected through a system of ecological corridors with all the national areas with particular significance for the conservation and restoration of rare species of plants and animals; it also enhances living nature resources. It is situated in an ecological corridor which is fundamental for northern Europe, one delineated by the system of large river valleys (the Oberswalde-Torun Lowland, the Middle Vistula River valley, the Bug valley as well as that of the Prypet River). The section of the Vistula River which adheres to the Park has been recognised as one of the areas which support habitats of water and wetland fowl (in compliance with the Ramsar Convention).

As a result of its central situation in the system of fundamental nature connections in Poland, the Park functions as the highest-rank environmental node.

Biodiversity

Within the primal Vistula valley, where the Park is situated, there are more than 50 plant complexes, including 12 forest ones. The Park and the present-day valley of the unregulated Vistula valley (old river-beds, sand dunes, isles, marsh meadows and shrubs) are extremely important living biotopes of many plant and animal species.

About 1,100 vascular species, more than 200 species of moss, lichen and liverworts have been identified. Unfortunately, the rich realm of fungi has hardly been investigated.

The species diversity of the fauna at the Kampinos National Park has hardly been identified, too.

It is estimated that, in view of its environmental diversity, the Kampinos Woods should at least include 50% of Poland's fauna species, that is about 16,500 species. But at present we have identified about 3,000 species. In the area of the Park the following species have been registered: 1,203 species of free-living eelworms, 51 species of snails, 5 species of molluscs, 25 species of annelids, 50 species of crustaceans, 390 species of arachnids, 14 species of centipedes, 8 species of diplopoda and 2,032 species of insects. As far as the vertebrates are concerned, there are 13 species of amphibians, 8 species of reptiles, 199 species of birds and 50 species of mammals.

In the woods 18 species new for science, 14 species new for Poland and many new for the region of Mazovia have been found. The valuable species in Kampinos include 76 species of endangered animals and 226 species of protected ones.

A worthy element of biodiversity in the Park is its mosaic of habitats and the resultant large number and length of ecotone zones.

Forests

The forests in the Park cover about 28,000 hectares, that is, about 80% of its total surface area. In it there are about 50 species of forest trees and shrubs. The most important forest- making species include:

- common pine *(Pinus sylvestris)* - 18,340 ha, i.e. 72%

- black alder *(Alnus glutinosa)* - 3,381 ha, i.e. 13%

- oak *(Quercus sp.)* (mainly the petiolar varieties) - 2,001 ha, i.e. 8%

- verrucose birch *(Betula verrucosa)* - 1,482 ha, i.e. 6% of tree- stands.

The dominating habitat is a fresh forest, which covers 37.6% of the forest area. Then, in succession there are: a fresh mixed coniferous forest (19.4%), a fresh mixed forest (9.7%), a humid forest (9.1%) and an ash swamp (8.4%). After World War II the sur-

face area of the Park has increased by 9,000 hectares. It has been an effect of forestation of idle land (deforested and degraded forest areas) and post-agricultural land purchased from private farmers (in 1975-90).

The average age of tree-stands (considering the recent forestation) is about 60 years.

The Park includes large areas of forest which are natural or hardly deformed by human management as well as considerable old-growth forests. For about 200 years the Kampinos Woods have been intensely managed. About 30% of trees is excessively poor in terms of species; it has low ecological stability and high susceptibility to biotic and abiotic factors. Poor internal biodiversity is also characteristic of monotonous tree-stands of the same age and species.

In the partial reserves, protective and breeding work is carried out on restoring the natural values of the forests. It includes tree cutting, tree-stand restructuring, species restitution and reintroduction -elk, beaver, lynx, Polish larch (*Larix decidua* var. *polonica*) as well as renaturalisation of waterways etc.

Tourist significance

The Park directly borders on Warsaw, which is a central point of domestic and international tourism. It is also a central junction of local and foreign significance.

Its position in the central junction of tourist routes places it in the domestic and international system of tourist relations and interests. In addition to its rich and diversified nature, places connected with the life and work of Frederic Chopin contribute to its high rank (Żelazowa Wola, Brochów).

The Park has a potential to become one of the major centres of specialised tourism in the whole of Poland, with an international range of influence.

At present, from the point of view of tourism, the Park plays an important role mainly for Warsaw and towns and localities around it. Sightseeing tourism is allowed in the Park (on foot, bicycle, horseback and skis). Tourist trails, about 350 km long, have been set up. To service tourists, 15 parking lots, 6 resting places and bivouac grounds have been put in place on the outskirts of the Park. The trails and structures serving tourists include many facilities and small architecture.

The Park can be reached on city and suburban buses. Every year between 600,000 and 1 million tourists and weekend trekkers visit it.

The Jadwiga and Roman Kobendza Didactic and Museum Centre at Granica plays an important role in the organisation and servicing of tourists. Its basic role is to implement the Park's educational objectives.

Climatic significance

Warsaw is surrounded by a ring of green areas which plays a fundamental role for Warsaw in terms of ventilation of the city, supplying oxygen-rich air. In view of its surface area and situation in this ring (northwest of Warsaw), the Park plays a key role (that of green lungs of the city) in the direction of prevailing winds. The wind rose indicates that at least every third day clean air from the Park reaches Warsaw.

Problems and hazards

Over the last 40 years there have been intense changes to the nature of the Kampinos Woods. The main causes of them include:

- intensified urbanisation in the functional area of Warsaw (the main centre of man-made pressure);

- severe drying of land;

- air and water pollution.

The foundation of the Park in the Kampinos Woods has also brought about many positive results for nature, e.g., in forest and land management and in sustaining ecological connections between the Woods and the surroundings etc.

The most important problems which need to be solved include:

- the preparation of a strategy of the protection and enrichment of biodiversity and sustainment of the ecological stability of the Park and its surroundings;

- the reconstruction (partial, at least) of the water retention in wetlands;

- further restructuring of tree-stands;

- the development of the principles of controlling natural succession in non-forest ecosystems;

- the sustainment of ecological connections with the areas surrounding the Park having high natural values;

- the implementation of a programme of intensive research (water, natural succession, nature monitoring, fauna, technical enrichment of ecological niches, the effects of species reintroduction, the history of the Kampinos Woods and nature education);

- the preparation of a strategy of the protection of the ecosystems in the Park and its buffer zone, with consideration given to the needs and expectation of residents living around it;

- the development of the educational functions of the Park, particularly for the local community;

- the identification of mechanisms preventing the expansion of building into the Park's area and the ecological corridors in its buffer zone;

- the restructuring of the agricultural function;

- the preparation of a design for modernisation of tourist management in the Park and its buffer zone as well as a programme of protection and use of cultural and sightseeing values of the region.

A plan for protection of the Park - its future

The law on nature conservation of 16 October 1991 made it mandatory to prepare protection plans for national and landscape parks, their buffer zones and nature reserves (a novelty in nature conservation in Poland). The Kampinos National Park was selected for the development of the first, experimental and, at the same time, exemplary plan of protection in Poland (the size, situation and biodiversity of an object, the number and magnitude of hazards).

The essence of the protection plan for this Park and its buffer zone is to establish a plan of protective, recultivating, restituting and renaturalising actions for particular types of ecosystems and natural landscapes. The plan is prepared for 20 years. It also includes a prospective image of the Park's nature for several dozen years.

The protection plan applies to both nature and man-made spheres.

In the autumn of 1995 the Minister of Environmental Protection, Natural Resources and Forestry is expected to approve the protection plan. The plan, which will be prepared in close co-operation with the local communities and self-governments around the Park, will be a binding document for all activities in the Park and its buffer zone. ■

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Rich woodland traditions of Scandinavia

Aarne Reunala

In scarcely populated Scandinavian countries forests have always been a major economic resource, used in a multitude of different ways. Cultural forest traditions are rich and a foreigner easily feels the special value given to the forests. This article is limited to the three most forested Scandinavian countries, Finland, Norway and Sweden, with 15 to 20 times more forest per inhabitant than in Central Europe. More than two-thirds of Finland's and Sweden's land area is covered by forests. In Norway the forest cover is only 27%, because of abundance of treeless mountains.

Forests are mainly coniferous, of two principal species: Norway spruce *(Picea abies)* and Scots pine *(Pinus sylvestris)*. Hardwoods, mainly silver birch *(Betula verrucosa)* and 10 to 15 other species like alder, ash, aspen and maple grow most often in small groups or as scattered single trees among spruce and pine stands. In southern Sweden hardwood forest of oak and beech are, also, found. On the average, hardwoods comprise 10-20% of stands.

In the north and on the mountains forests are limited by treeless tundra and trees grow much slower and forests are less dense than in the south. In the north, 120-200 years is needed for the growth of large-sized timber whereas in the south 70-100 years is enough.

Multiple forest use history

About 10,000 years ago hunters and fishermen occupied the land bit by bit after the receding glaciers. Forests were used, besides for hunting, for all necessities of life: firewood, construction wood, berries, material for clothes, shoes, tools and weapons. Furs were the first export product in order to import valuable goods like salt and jewellery.

Farming was introduced to Scandinavia over 5,000 years ago, but it was only during the first millennium that permanent agriculture and animal husbandry began to have practical importance. Most fertile forests were cleared for cultivation and forests were used as pasture for domestic animals. Forest pasturage ended only in the 20th century with the emergence of modern agriculture and the oldest form of culture, swidden cultivation, remained part of forest use up to the beginning of the 20th century.

Tar, which was important especially for ship building, was produced by burning pine wood in specially constructed pits. Finland and Sweden were Europe's main producers in the 17th and 18th centuries because of abundance of pine forests. Wood was, also, used for the production of charcoal and potash, which could result, locally, into overuse and forest destruction.

The use of wood for domestic needs has been extremely important and varied. Buildings were constructed of timber and their roofs were covered with shingles. Wood was the most important domestic fuel, and is still generally used in rural habitations. Wood was used for fences, furniture, tools, dishes, shovels, ladles, scoops, bowls and baskets. Wooden torches were used as a source of light, sleighs and carts were made of wood. Birch bark was used for boxes, baskets, shoes and inner soles of leather footwear. In particularly severe famine years bread was made of pine bark.

At the end of the 19th century, developing timber industries began to change forest use pattern. Timber felling and transport offered much needed work to rural populations and timber sales revenues allowed farmers to modernise their agriculture. A standard of living never seen before became accessible to a largely increased rural population. One important consequence of increasing timber prices was, also, the development of modern silviculture.

Forest industries are, still, among the most important export industries, giving in Finland 40% and in Sweden 16% of these countries' revenues.

After World War II new technology was introduced in silviculture. Artificial regeneration, soil preparation, use of herbicides and fertilisers were applied, and infrastructure was improved by forest road building and drainage of peatlands. Since the middle of the 1970s the intensity of forest operations has slowed down, as a consequence of improved timber balance, decreasing profitability and environmental issues. Intensive timber production has been felt, also, as a threat to cultural and spiritual values atached to forest landscapes and earlier "real forests". A cultivated forest is not a "real" forest in Scandinavia.

Forests and trees as symbols of life

Forests have been essential for the existence and economic well- being of Scandinavians, but at the same time, forest and trees are powerful symbols of life, or archetypes in Jungian terminology. These kinds of archetypal forest values are maybe more prominent in Scandinavia than in many other countries.

In ancient times people wondered how sun, moon and the stars could hang up in the sky without falling down. When somebody had a stone in his hand and opened the fingers, the stone fell down. Why didn't the sky and the stars fall? The evident answer was that something supported the sky, and it was, wise men said, a huge pole or a huge tree. Nobody had seen it, but it was in the mythical centre of the Earth. In Scandinavian mythology, the holy ash-tree was called Yggdrasil.

From this original image of the World Tree, which is spread all over the world, were born innumerable beliefs and customs, where the tree and wood have a good, protective function. Special memorial trees and other sacred trees protected the household and brought good luck. In the middle of the burnt clearing, the farmer might leave a tree to protect the land's fertility. Wooden objects, foliage and branches have been used in spells for curing diseases, protecting people and domestic animals and bringing good luck in hunting and fishing.

It is remarkable that World Tree customs are not only history but also everyday reality even in urban Scandinavians' life. People just do not think about it. Maypoles are still raised at Midsummer festivals, and Midsummer and Easter bonfires are burnt. Midsummer fires are big events in many cities, even in the Scandinavian capitals of Helsinki, Stockholm and Oslo. The original purpose of fires was to protect from evil spirits and disease. The use of a birch whisk in the sauna and willow branches at Easter

are heirs of the old healing spells. The well-known saying "touch wood" has, probably, its origin in the World Tree beliefs. At least the meaning of the saying is the same as in all World Tree customs: to protect a person from possible misfortune.

Common national property

In Scandinavia forests are felt to be a national property, like an insurance that gives security in an uncertain world. Their existence is highly valued, just because they have provided a livelihood for every generation of ancestors. Especially important in Scandinavia is the traditional common right of access to all forests. Everybody is free to walk, ski, pick berries and mushrooms and even stay overnight in any forest, with the condition that no damage is done and the owner is not disturbed. Free access exists not only in publicly owned forests, but also in forests owned by private families or industrial companies. Free access to privately owned land is especially important, because about 75% of the forest area is in private ownership. Free access is widely used for berry and mushroom picking, hiking and skiing, and strengthens the feeling that forests are a kind of common national property, important for everybody.

Place to escape and feel free

When people have had difficulties in their everyday life, they have sought escape in the forests in Scandinavia. They have escaped the authorities, they have escaped enemies during the wars, and, generally, it has been very common to escape to forests when life in family or in the society has been too unhappy and stressful. A current theme in the Finnish traditional folk poetry is a lonely person, who goes alone to the forest and cries his sadness to the trees, who are his only friends.

Ordinary people of today, also, when talking about their forest experiences or a weekend at their summer house, almost without exception say how free and relaxed they are in the forest, and how nature gives them new strength and energy. A weekend in the countryside is a kind of spiritual and physical revival.

Forests' positive role has two sources. First there is a kind of push effect of stressful everyday environment. When life is difficult at work or at home, it is good to get away for a while and have some rest. But forests have, also, positive pull effects because of their naturalness. When the strain is caused by humans, it is good to rest in forests with no or little human influence.

As a symbol of life forest gives, also, a reassuring feeling of life's deepest essence. In addition, the forest is a symbol of mother. It is no coincidence that we use in our language expressions like "Mother forest", "Mother nature", or "being in the lap of the forest" or "rape of the forest". There remains, somewhere in our deepest soul, more or less strongly, an unconscious desire to get back to the eternal paradise, the original state of relaxed well-being in the lap of our parents, or, as some psychoanalysts say, in the womb, which was the real paradise for us, now lost forever. In a study it was, in fact, confirmed, that three Finns of four feel the forest as a womb-like protecting paradise, where one can feel safe, free and relaxed.

Another psychological dimension comes out from the studies of environmental psychologists, namely that familiarity of environment is important. We all get attached to places where we live. We have "our" forests, our hills, our streets, our houses. Places come to represent a part of our identity. If something changes or destroys our places, we get angry or sad. In Scandinavia, where forests are such a prominent part of the environment, innumerable memories and feelings are attached to forests.

Once I met a Finnish teacher, who remembered how wonderful it was when she as a child went berry-picking with her parents on a beautiful open hill. And how disappointed and sad she was, years later, when she came back and the hill had disappeared, because thick forest had grown on the hill. Her childhood environment, a clear-cut hill with abundant growth of wild raspberries, did not exist any more. Normally, in Scandinavia, disappointments have been the other way round; forests full of memories have disappeared because of cuttings.

It is important that forestry tries to integrate economic, ecological and cultural forest values. Economic value of forests is rather simple to understand. Timber has value, so do game, berries and other commodities. Cultural and intangible forest values are more difficult to grasp. For many years, talking with forest managers, I have found it helpful to divide intangible values into three classes:

- archetypal values, which are common for the whole humanity;

- cultural values, which are typical for a certain nation or a certain population;

- psychological values, which vary according to an individual's life experiences.

Forestry has, so far, given too little place to such intangible values. While timber production remains the main value of Scandinavian forests for the years to come, foresters need to make more efforts to learn and understand the cultural history of forest use and try to respect it in forest management. ■

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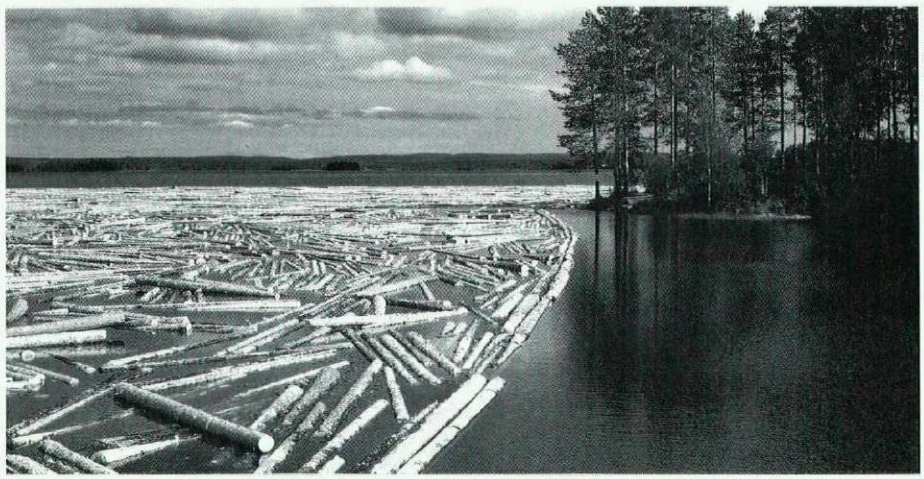
Timber floating is a part of Scandinavian tradition.



B. Neeleman

S. Cordier

Scotland as we imagine it ...

Reafforesting Scotland

Graham Gill

Scotland is well known as a tourist destination. Its mountains and moorlands, lochs and rugged coastlines draw visitors from all parts of the world. Famous for its castles, golf courses and whisky made from the pure, peat-filtered water of Highland streams, it is probably less well known for its forests. This is hardly surprising. Only about 1% of the natural forests which once covered Scotland still remain and these are in a much modified state. Yet forests in Scotland are of major and increasing economic importance. In many parts of the country, they are a dominant feature in the landscape and their potential for tourism, rural development and wildlife is now beginning to be realised.

75 years ago, forest cover in Scotland had fallen to 5% of land area. Today, increased to 15%, Scotland has more forest cover than the UK average of 10% but still considerably less than the 25% average for countries of the European Union. Since 1919 when the Forest Commission, the government department of forestry, was established, successive governments have encouraged the expansion of the forest area in Britain. The UK continues to import some 85% of its wood requirements, and government policy has consistently aimed to meet more of this demand from the UK's own resources. Climatic conditions in Scotland are highly favourable for tree growth, particularly for conifers, which represent 80% of the UK's timber demand. Growth rates are commonly two to six times those of other countries from which the UK traditionally sources its timber.

Production doubled in ten years

Wood production from Scottish forests has doubled over the past 10 years and is set to more than double again over the next 20 years because of the significant afforestation programmes in he latter half of this century. This wood production has led to a substantial investment in wood-processing capacity which will continue to expand in the future. Scotland now has six major sawmills which have increased their capacity and installed modern technology. The new BSW sawmill, just over the Scottish border at Carlisle, is one of the most technologically advanced in the world. It is well placed to utilise the timber from the forests of southern Scotland and northern England, created half a century ago. Caledonian Paper's mill at Irvine in Ayrshire is the largest ever single inward investment in Scotland. Employing over 400 people, it utilises the long fibres of Scottish-grown spruce to produce strong white paper, and is the only UK manufacturer of glossy magazine paper. Norbord Highland's oriented strand board (OSB) mill near Inverness concentrates on pine, both Scots and lodgepole (*Pinus silvestris* and *P. murrayana*), which predominate in the forests of north and east Scotland. In many cases, OSB is a substitute for plywood, and Norbord Highland, as the UK's only manufacturer of this board, has captured a significant UK and export market. Caberboard's medium density fibreboard and chipboard factory at Stirling uses large quantities of timber and sawmill residues contributing substantially to the UK's current level of 50% self-sufficiency in both fibreboard and chipboard.

Forestry and primary wood processing in Scotland employs some 15,000 people. While comparatively small in national terms, this employment is vital to the maintenance of a healthy local infrastructure particularly in many of the more rural areas.

Recent forests

Many of Scotland's forests are relatively new, having been created within the last 30 years: hence the substantial increase in wood production in the near future. To maintain and increase this level of wood production in the long term, both industry and government wish to see the forest area continue to expand.

In the past, wood production was the primary, and at times the only, reason for creating new forests. That is no longer the case. Forestry policy today is firmly based on the realisation of multiple benefits. Wood production takes its place alongside a whole range of reasons for forest expansion, for example enhancing biodiversity, landscape and cultural heritage, developing opportunities for tourism and recreational enjoyment, and improving the physical environment.

Many of these objectives take time to achieve. New forests inevitably lack diversity, particularly of structure, which is essential to make them attractive both to people and wildlife. But diversity increases with maturity, a process which can be accelerated by careful initial design and sensitive management. Forestry Commission environmental guidelines describe how forests should be created and managed to harmonise with the landscape, conserve and enhance wildlife habitats, protect water quality and provide opportunities for recreation. Compliance with these guidelines is an essential requirement for grant-aid for tree planting and forest management.

In parts of Scotland where forests have achieved a degree of maturity, they improve the scenic qualities of the landscape and provide many attractions for tourists. Compared to fragile mountain and moorland habitats, forests provide a robust setting for a wide range of recreational activities - walking, cycling, horse-riding, bird-watching and canoeing - without damage to the environment. The popularity of the Trossachs, Perthshire, Strathspey and Deeside as tourist destinations is not unconnected to the maturity of the forests in these areas. As more recently created forests develop in structure and diversity, so their tourist potential increases. Nowhere is this more clearly illustrated than in Galloway in south-west Scotland, where tourism development is closely linked to the increasing opportunities available in the extensive maturing forests.

Landscape change

The creation of a new forest means significant landscape change, and change on a large scale can be controversial. There is now general agreement between foresters and environmentalists that Scotland needs more forests, and that new forests must take other land uses into account, respecting the needs of landscape and nature conservation.

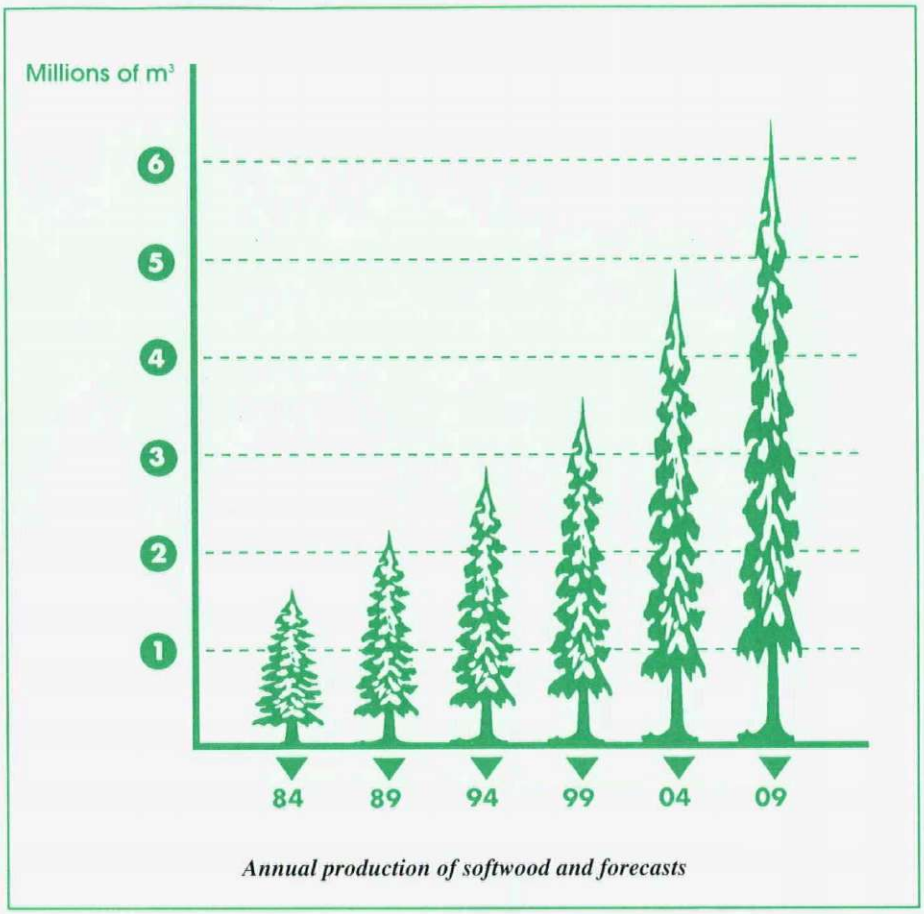
The debate now focuses on the location and type of forest: the desire to get the right trees in the right places. The process has been greatly assisted by the introduction of Indicative Forestry Strategies. These are prepared by local authorities in consultation with all interests, and indicate those areas where local authorities wish to encourage the creation of new forests. Environmental

guidelines, public consultation and environmental assessment help to ensure that new forests are designed and created in a way which will maintain and, where possible, enhance environmental values.

The range of payments available for tree planting within the Forestry Commission's Woodland Grant Scheme reflects the Government's desire to see the creation of a variety of new woodlands, appropriate to their individual circumstances. Additional payments are available for broadleaves, for the creation of new native forests of natural character, for planting on farmland, and for creating woodlands suitable for public recreation close to towns. Grants for native pinewoods have resulted in the planting of some 6,000 ha of new woodland over the past three years, a significant addition to the 16,000 ha of remnant native pinewood which continues to exist in Scotland.

Non-native conifers continue to play an important role in expanding Scotland's forest area. Their timber productivity, site for site, is at least 50% more than that of Scotland's only native conifer, the Scots pine *(P. sylvestris)*. The financial returns from Sitka spruce *(Picea sitchensis)* can be three or four times that of pine. As a construction timber, spruce is of an equivalent value to pine, and it is much preferred for paper manufacture.

But forests of predominantly non-native species need not, and should not, be devoid of other benefits. They can contribute positively to landscape quality; they create a forest structure, which, with appropriate management, provides a habitat for a wide variety of native species, both plant and animal; and they provide opportunities for a wide range of recreation activities.



Annual production of softwood and forecasts

Achieving objectives

It would be wrong to try to divide new forests into productive and environmental categories. Multipurpose forestry does not mean giving equal weight to every objective in every area, but it does mean that no objective is given zero weight. Thus there is a continuum of new forest types from those where non-native species predominate and wood production takes a high priority, through community forests with recreation and amenity high on the agenda and farm woodlands with their own objectives, to new native forests where conservation and the enhancement of biodiversity is a primary reason for their creation.

Open vistas and habitats are an important part of Scotland's heritage, and are valued for their landscape and wildlife importance. Raised bogs, blanket bogs, heather moorland and species-rich grasslands are examples of seminatural habitats which have acquired their own assemblages of wildlife and possess their own landscape and cultural values. Tree planting proposals must respect these values. In some cases no tree planting will be appropriate; in others, the creation of native woodlands may enhance the conservation value of the habitat, where more intensive types of forestry would be inappropriate. The Forestry Commission's aim is to ensure that grant-aid is available for tree planting only if it does not damage habitats of conservation importance. It would be wrong to be too definitive about sites where forestry should be totally excluded: opportunities for enhancing landscape and wildlife values through sensitive planting of appropriate native woodland could be missed.

There is much potential in Scotland for a continued expansion of the forest area, across the whole range of forest types. Given the right combination of scale, nature and location, forest expansion will bring economic, social and environmental benefits while maintaining the existing environmental qualities which are so much a part of Scotland's heritage. ■

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... and its forest plantations.

S. Cordier

J-L. Klein/Bios

In the South

Alfonso Alessandrini

The history of the Mediterranean forests is marked by the rhythm of the civilisations of the three continents bordering on an almost totally enclosed sea. In former times these forests stood for prosperity and culture: one has only to think of the Phoenicians, the Etruscans, the Egyptians, the Greeks and the Romans. But in their present impoverished state they are more often acquired as a natural resource than for any productive purpose. Of the European countries bordering on the Mediterranean, many failed to accomplish the industrial leap forward of continental Europe and so still have forests which are little affected by acid rain, quarries, dumps and rubbish scattered about or concealed in the woods. The farming, tree growing and herding civilisation exploited the forests but did not disfigure them.

Mediterranean forestry is marginal to the international timber market. The only avenue still open for it lies in husbandry of the natural environment, which means neither leaving the land derelict nor managing it productively. It means maintaining the natural balance, the advantage being that prevention is less costly than reconstitution.

Maintaining a balance

Forest maintenance is not a subject that can be addressed in abstract or emotional terms. It calls for commitment, enthusiasm and hard work on the part of those whose job it is to look after the forest in the knowledge that their work is useful to the country and to society, both now and in the future. This work must be supported. Even the European Community in its latest recommendations has taken the road of public aid to private forests.

It is necessary to establish the minimum level of human population, of woodland, parks and wilderness areas for each homogeneous zone, while at the same time allowing human resources to return to their central position in the conservation of natural resources.

As well as ecology one needs "ecosophy", that is to say environmental wisdom and knowledge. Our society challenges everything and discusses everything: free time, recreation, meditation, the landscape, the environment, all the new ingredients of the life of modern man. We need to be united around an international project for the Mediterranean forest which must also be a human project founded on the trinomes town/countryside/forest (for the physical environment) and arts/science/religion (on the cultural side).

Greater diversity

The Mediterranean forest harbours more species than the continental forest, and in this sense its biogenetic density is higher. The continental forest has its growing period in summer, whereas much of the Mediterranean forest rests during that season. As a forest it is not particularly spectacular from a landscape standpoint, but it does harbour broadleaved evergreens. Its woodlands produce fruit, acorns, chestnuts, arbutus and pine kernels, and under the trees one can gather mushrooms, truffles and medicinal, ornamental and aromatic plants.

After being coppiced for many years, the natural forest was frequently replaced by rapid growth plants, chiefly pine and eucalyptus, which changed its character. Over the years there occurred a development towards xerophilous vegetation more resistant both to fire and to drought. The biological diversity of the Mediterranean forest is its defence against pollution damage. Even so, in many woodland areas, indirect pollution is a cause of considerable damage owing to the offshore winds in the parts close to the major river estuaries.

A biological indicator

In this way the forest has become an indicator not only of the quality of the sea but also of the good management of the land and the quality of the surface waters. The forest of San Rossore, in Italy, offers the most telling example, as the south-west wind coming off the sea deposits pollutants on the trees in the form of particles carried down by the waters of three rivers onto a small stretch of coastline.

We are facing a period of great climatic uncertainty, and already the first signs of migration on the part of Mediterranean maquis vegetation are discernible. For the moment, migration is vertical rather than horizontal in that the species concerned are moving from a laurel to a chestnut landscape in search of higher rainfall.

Any worsening of the state of the sea as a result of pollution by hydrocarbons could cause untold damage to the Mediterranean forest, the "forest of sun, light and history".

From a religious standpoint too, civilisation found symbolic trees here, like the olive, the sycamore, the yew, the oak and the laurel which feature in the scriptures. Thus there are also sound historical and cultural reasons for promoting international action on behalf of the Mediterranean forest.

Difficult conditions

It is difficult to make trees grow in arid areas with no winter snow or summer rainfall. Forestry is easy in the humid lands of central Europe but difficult where the land is dry. The social, civil and economic history of the countries bordering on the Mediterranean basin was largely written by peasants and shepherds. Peasants like fields but not trees; shepherds like grass but not trees; woodmen like wood but cut the trees down. Town-dwellers, for their part, like trees but know nothing about them. They like to see trees growing in towns, but not to have them in the way when they are trying to park their cars.

True, the forest has lost some of its economic viability; on the other hand its value in terms of environment and landscape, as a hydrogeological, genetic and cultural resource, and therefore as a resource for tourism, has been enhanced. But we have still not managed to find the proper place for these functions in the economic scale of values. We should not forget that the great desert zone is threatening the Mediterranean basin, and may even be advancing.

This ecosystem must be protected on account of its effects on the biosphere (the pedosphere, the atmosphere and the hydrosphere) and as a means of preserving the living environment of human beings. The future of a civilisation is at stake, a civilisation whose greatest need now is not so much for firewood, grazing land or cornfields as for a good environment. Reforestation is one answer, but reforestation simply means tree farming; it does not create woodlands.

As its name suggests, the Mediterranean is a sea surrounded by land, but it is highly polluted and the land around it is becoming more and more devoid of trees. The sea regenerates more quickly than the forest. If the level of the sea were to rise, the salt content of the groundwater would increase, creating serious imbalances in the vegetation of the Mediterranean maquis. Those who claim that increased carbon dioxide levels improve vegetation density should bear in mind that violent climate changes and higher sea levels have biological as well as physical consequences. To worry about the fate of dolphins, sharks and whales, or of wolves, bears, cormorants and herons, is certainly commendable, but without a genuine concern for the victims of uncontrolled progress - namely the forests - it is evidence of a very short-sighted view of the environmental imperatives of the 21st century.

Nature and culture

The Mediterranean basin, says Predrag Matvejevic, cannot be defined with reference to time or space. We do not know how or on what basis to draw its boundaries: we cannot explain it in terms of sovereignty or of history; it is neither governmental nor national. For centuries, peoples and races have mingled, merged and come to blows here as in no other region of the world: signs of similarity and of difference between them are, as a rule, exaggerated. In every national culture, the Mediterranean identity stands out and seeks to assert itself in one particular way or another: *"idem nec unum"*.

The level of the sea is controlled, along with the quality of the air, by the capacity of the vegetation on land and the "forests" of the sea to reduce the amount of carbon dioxide. As the sea covers seven-tenths of the planet, the challenge can be met only by international solidarity, which could also be seen in a religious perspective if we take account of the fact that, in the Mediterranean basin, three monotheistic religions, Christianity, Judaism and Islam, have co-existed through the ages. For millennia, the Mediterranean basin has been awaiting peace; peace, not only in political terms but also in terms of culture, nature and religion. Why should we not begin to make peace by "adopting" the Mediterranean forest as an ecumenical forest, bringing together all the trees of all the religions. Ultimately, it is all a question of harmony between heaven and earth. ■

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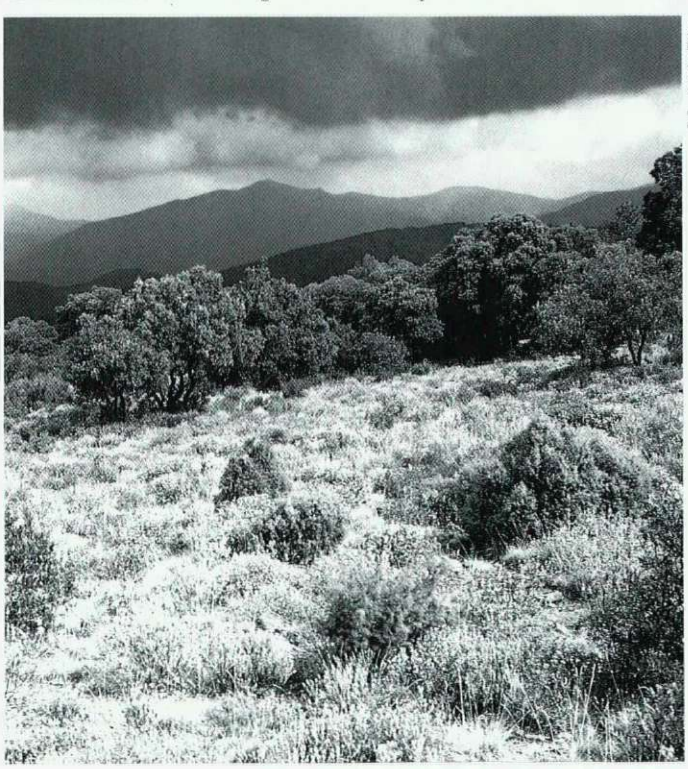
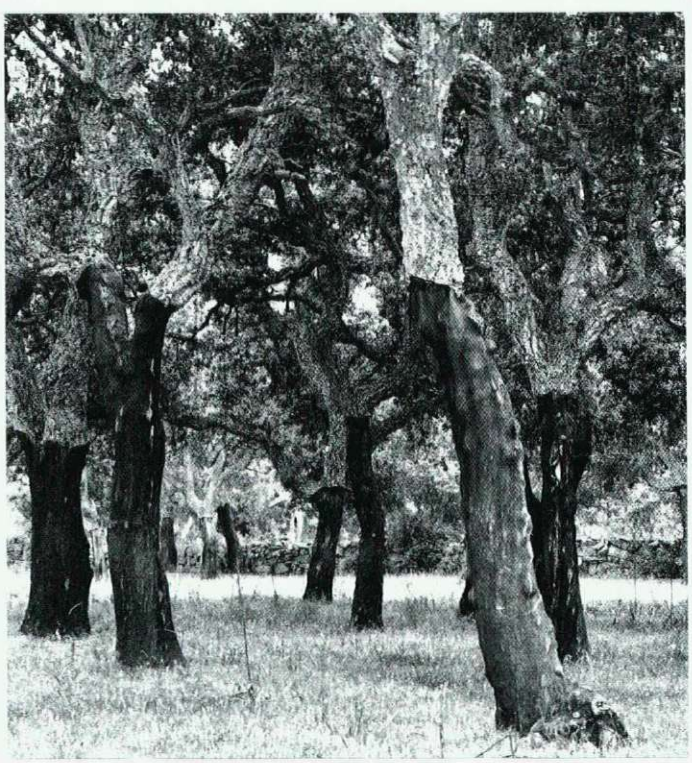
Holm-oak and cork-oak belong to southern Europe.



J-L. Klein/Bios



B. Neeleman

Horses in the woods

Bernard Palluet

More often than not the notion of using techniques from the past to solve the problems of today gives rise to a degree of perplexity. Those with the resolve not only to put their thoughts into action but also to try to perpetuate abandoned methods, are met at the least with a smile if not with open hostility or constantly accused of striving for utopia. This is very much the case when we talk about using animals to haul timber.

Yet, our Belgian and German neighbours have never completely turned their backs on this "natural method" of logging. How then can we imagine that animal traction does not have its place in our forests. Personally, I am inclined to believe that it is the result of the long-standing separation in France between forestry on the one hand, and logging on the other, and a failure of one profession to appreciate the other. Under these conditions, how could a forester imagine that the best way of solving his forestry problem is a method peculiar to logging and, likewise, why would a logger be aware of the need to use animal traction if he is not interested in forestry?

New ways and means

For the link between the two professions to be established, the forester should not load the responsibility for logging work onto his colleague lower down in the production line and, on the other hand, the logger should take into account the sylvicultural imperatives established by the forester. It is in exploring these avenues that other ways and means can be discovered, and precisely those which allow psychological barriers to be lifted and technical problems which are normally dealt with inadequately can be solved.

It is apparent that the business, stimulated by this state of mind when it incorporates animal traction into its range of services, is managing very well to overcome all the difficulties which it normally has to face. Above all, using animals should be designed not as a substitute but as a complement to mechanisation. It only becomes a substitute when machines cannot be used.

This resolve to regard animal traction as one of the available techniques means that it will be used under the same conditions as any other method. It must meet economic requirements and, to achieve this, match normal productivity levels. Consequently, it needs to be organised rationally and divested of all its antiquated and amateurish features.

Experience shows that in order to produce results, the haulage of timber by animal traction must form part of logging business strategy, corresponding to the exacting standards in the areas of quality of work and productivity. The conditions under which it is used should be a subtle compromise between the desire to solve technical problems and the need to respect economic principles imposed by the law of the market.

More timber

Its use can also lead to an increase in the amount of quality wood available and enhance our forestry heritage. In fact, its influence on the psychological factors preventing certain landowners from taking decisions, as well as technical factors limiting mechanisation, removes the various obstacles preventing necessary work for good forest management from being carried out.

I firmly believe that the regular use of this method in the logging industry will inevitably bring success, as long as the factors limiting the maximum effectiveness of animal traction are taken into account. These factors include the lie of the land, the haulage distance, the average volume of trees, and working and storage methods. Integrating animal traction into the whole process of logging leads to maximum efficiency and increases productivity up and down the production line.

Under these conditions and, contrary to received wisdom, the cost price of this technique is very close to market costs. On small sites with only a limited amount of timber available animals can even be more economically viable than a tractor.

While costs are the same as those for mechanisation on sites served by road where direct loading on to lorries is possible, the cost price of haulage increases beyond a certain distance necessitating joint use of animals and tractors.

Towards better forestry

Whatever the case, the reward is always better quality forestry.

For the forester this last aspect represents the ultimate argument, the one which should carry the day, because the survival of the forest comes before any short term profit and an increase in the potential of the forest is far more important than an immediate financial result.

Thus, in order to be credible and have a chance of succeeding, the logical line of argument for the use of animal traction must always take account of economic factors and use technical analysis so as to influence environmental and forestry decisions.

Because they have completely ignored animal traction since the advent of mechanisation, our schools have produced a generation of foresters and loggers who know nothing about the potential of this method. How could all of these people imagine that under certain conditions animals can provide a service beyond compare? Today, for the greater benefit of our forests we should re-acquaint these people and forestry owners with the advantages that can be gained. ■

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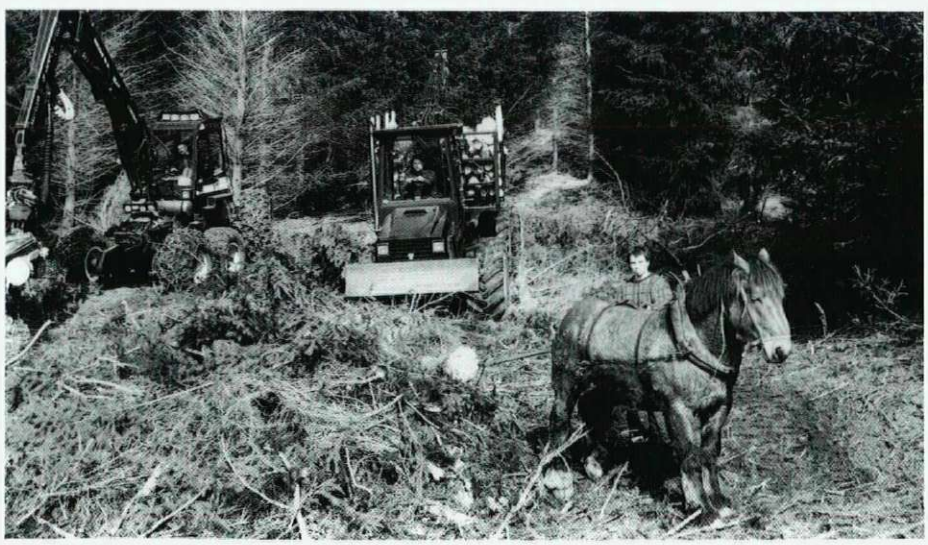
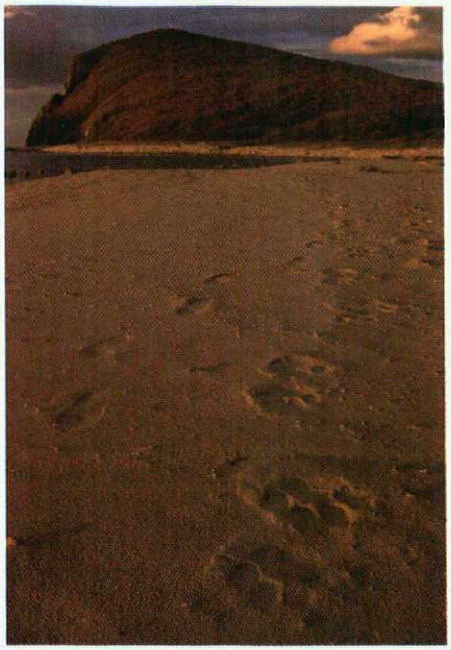


B. Palluet

Horse and machine can be complementary in the forest.



V. Jivotchenko (2)

Siberian tigers

Viktor Jivotchenko

The Sihote-Alinski biosphere reserve, created in 1935, was until 1951 the largest in the USSR (1.8 million ha) and the most northern in the world among the reserves suitable for the Amur tiger *(Panthera tigris longipili)*. Now it is one of the centres of investigation and protection of the Amur tiger in Russia. From 1936 to 1941 L. N. Kaplanov conducted here his pioneer research by track observation. From 1992 American zoologists investigate the tiger by radio telemetry.

In the beginning

In the 1930s at the time of the reserve's creation, there was no question of tiger protection. The adult animals were killed and young tigers were captured. As a result of this, several hundred tigers remained in the whole far east of Russia till the end of the 1930s, with only four or five individuals in the territory of the Sihote-Alinsko reserve. Thanks to the efforts of L. N. Kaplanov and the first director of the reserve, K. G. Abramov, hunting and capture were stopped and the number of tigers began to increase. But that process was not a quick one because of the reduction of the reserve territory (99,000 ha in 1951).

At the beginning of the 1980s about two young tigers appeared in the Sihote-Alinski reserve every year. The previously proposed doubling of the number of tigers in the reserve did not take place. In the middle of the 1980s, their number stabilised and apparently reached the natural data. At the same time the centre of tiger activity transferred from solitary places to the Japanese sea coast where the population and human activity were higher. At the beginning of the 1990s the tiger population grew to six. Now the average data of tiger population in the reserve is equal to the ecological capacity of habitats - four to five animals per 1,000 sq km, and at the coast this data reaches eight.

Current situation

Between 1986 and 1992 not less than 15 tigers perished here, most of them being six to 18 months old. Cannibalism among these animals (not noticed before) began to be observed (about five such occasions in 1983-89), although the status of food resources in the reserve and adjacent territories remained favourable. But on the other hand, together with the growth in the tiger population especially at the coast, the role of domestic animals grew.

Even in the 1930s, when the tigers were on the brink of extinction, they did not live in solitary places. They appeared in the daytime along roads and fields not far from villages. Certainly together with the growth in tiger numbers, this neighbour become more noticeable. Although in the period of depletion in the 1960s tiger were not remarked, now they are met there frequently. But these predators hunt only dogs, while there is a lot of other free-roaming domestic animals. More often people meet tigers in the forest. Perhaps near the settlements they are more careful. Out of 206 such occasions, in ten cases we can mention the aggressiveness of tigers (in four cases the people were with dogs), but no attack took place. We know of two cases of man-eating in the Terkaiski region. But we can contend with assurance that it is not characteristic and there are no real man-eaters among Amur tigers. For the entire territory of Primorski Krai between 1970 and 1992 we know of eight tiger attacks, in which five men were in danger. In six cases the aggressive behaviour was caused by man. Among the attacking animals were five males and three females, six animals being older than five years. Five out of eight animals were seriously ill and two less so. Only one of them had no pathological changes.

Uncertain future

Such was the situation in the 1980s. But the socio-economic changes in Russia made the situation more critical. American scientists in 1992 supported the results of Russian researchers. It was discovered that the individual territory of the young female tiger is five times bigger than that for an adult Bengal tiger in Nepal. This is why the Sihote-Alinski territory 347,052 ha) is not big enough for the Amur tiger population. In nature there should be perhaps less than 400 tigers and not more than 200. But the status of the Amur tiger remains dangerous because of the unstable political situation in Russia at the start of a new phase of increased exploitation of natural resources. The rate of killing of animals which are interesting from the export point of view is growing nowadays. Skins and bones of tigers and other animals are exported. The situation was beyond the control of the State organs. It is very important to regularise the situation in adjacent countries: China, Japan, Korea and other countries of south-western Asia and also in the USA. ■

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At the Council of Europe

Towards a European Rural Charter

The countryside is one of Europe's major strengths and a fundamental part of its identity.

Regional and coastal planning policy should not be predominantly focused on the major cities, but should ensure lasting vitality and prosperity for the countryside and coastal regions, as prerequisites for maintaining the fundamental balance of our society as a whole.

The colloquy at La Grande Motte has emphasised the need to reverse the trend of devitalisation of the countryside, in order to preserve the social harmony which is currently threatened by unemployment and other problems (such as drugs and delinquency) typical of urban areas. It has also revealed that the topmost priority is to protect the natural environment and to create a prosperous countryside on a human scale where European cultural diversity can thrive. The increasing international economic integration and competition do not pay attention to rural cultural values, the beauty of the natural man-made rural world, its social structures and traditional life-patterns.

The colloquy confronted with too much technocracy, reconfirmed the Council of Europe's vocation to represent and protect the cultural values of the peoples of the Greater Europe of which life in the countryside is an essential component.

The colloquy considered that agriculture, aquaculture, fishing and forestry play, and will continue to play, a vital role in the rural economy, which should be diversified. A stronger regional economic autonomy and the integration of economic, environmental and cultural policies are urgently needed.

Rural development policies must encourage and ensure this economic diversity. The existence of an appropriate operational infrastructure is a key factor in stimulating the (re)vitalisation of Europe's rural areas. Education and vocational training are undeniably factors in the development and survival of the countryside, but they are also strategic elements of primary importance in economic, cultural and social development. The education system must enrich rural Europe instead of draining the countryside of its human potential.

The colloquy at La Grande Motte has stressed the important role which rural entrepreneurs and businesses can play in job creation.

The agricultural sector and the countryside must be entrusted with new forms of production, particularly the production of raw materials for the energy and industrial sectors, in other words the promotion of renewable energies and materials, and the development of tourism and services.

In order to provide a solid foundation for local development, it is vital that socio-occupational organisations and elected representatives in local and regional government be clearly recognised as indispensable partners in generating action in an upward direction.

The tasks of rural actors in protecting the environment must be better defined, encouraged and given its right value.

Through protecting rural culture and the natural and built environment we will ensure that future generations of Europeans will be able to enjoy the wealth of our countryside.

The Conference becomes a Congress

In 1994, the Council of Europe's Standing Conference of Local and Regional Authorities of Europe (CLRAE) became the Congress of Local and Regional Authorities of Europe (CLRAE). It held its first Session from 31 May to 3 June 1994.

Behind a slight change of title, lay a significant political reinforcement of its status, now well on the way to becoming the third political pillar of the Council of Europe, alongside the Committee of Ministers and the Parliamentary Assembly.

Its activities on environmental questions, formerly conducted by a specialised Committee on the Natural and Built Environment, are to continue in the form of a number of specific projects carried out by ad hoc working groups.

Such activities are to include:

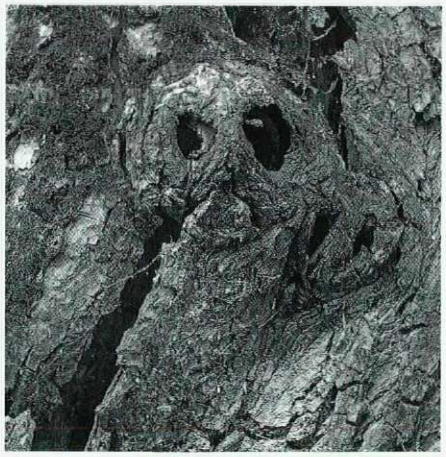
- the role of local authorities on sustainable development and, particularly, the preparation of a report for the 1995 Plenary Session on Local Fiscal Incentives for Environmental Protection;

- the planning of a contribution to the European Nature Conservation Year. Such a contribution will consist primarily of the organisation of two colloquies on the theme of the Year; mobilisation of support for it through national associations; the preparation of a report for the 1995 Plenary Session of the Congress and the preparation of a manual on good practice on nature conservation by local authorities;

- the preparation of a European Landscape Charter, building upon the Charter for the Mediterranean Landscape, adopted at Seville.

At its 1994 Session, the Congress examined two reports and adopted a Resolution and a Recommendation covering the two reports, ie: "The Environment in Central and Eastern Europe: the Role and Responsibilities of Local and Regional Authorities", and "Environmental Co-operation between Local and Regional Authorities in the Eastern Baltic Region".

Of environmental interest also is the organisation by the CLRAE of a Colloquy in Whitehaven (UK) in December 1994 on Nuclear Power Installations and Local Authorities. ■



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Forests of Europe

Rich and varied, essential to all


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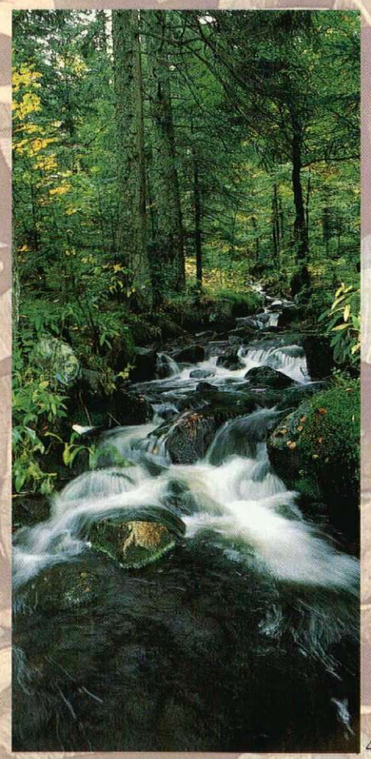
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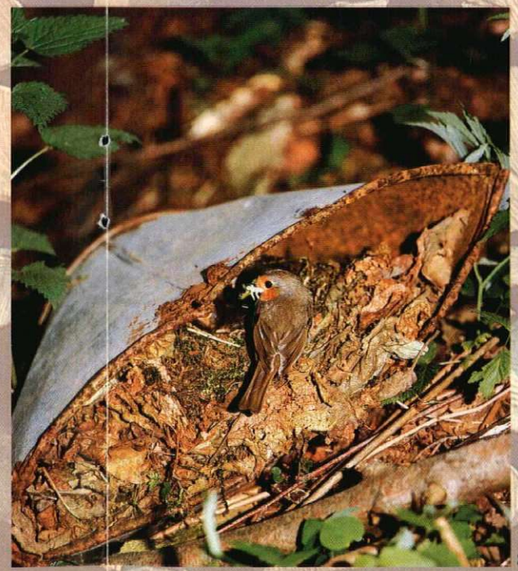
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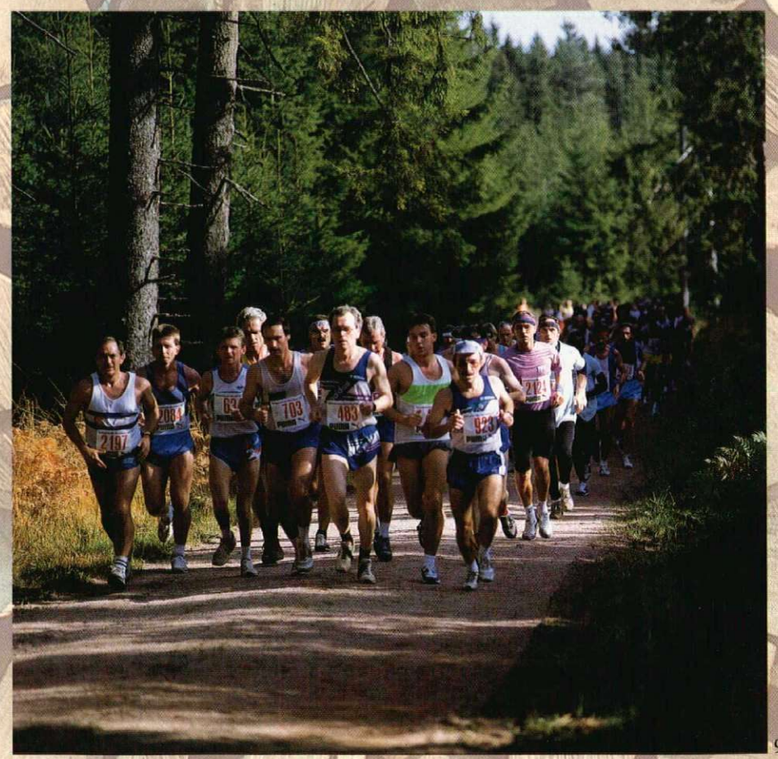
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