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# Environmental Awareness

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# **Environmental Awareness**

**A survey of types of facilities  
used for environmental education  
and interpretation in Europe**

**Council of Europe**





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## FOREWORD

In the series of studies published in recent years under the auspices of the European Committee for the Conservation of Nature and Natural Resources, the present survey is the first of its kind.

This publication certainly does not aim at presenting a comprehensive picture of environmental education facilities in the member states, but endeavours, by means of a classification, to list such facilities which may be considered as type sites. The definitions given in the Introduction enhance the value of this work. A further interesting feature is the full coverage of environmental interpretation and its relation to the definition and description of environmental education. May environmental education and interpretation vigorously stimulate environmental awareness! Since a method is being developed in the Netherlands to measure and to evaluate environmental awareness, it is also hoped that the results obtained with this survey may serve to refine this measurement technique.

May this publication also make its mark in the non-member states of the Council of Europe.

J. P. Doets  
Late Chairman

European Committee for the Conservation of  
Nature and Natural Resources



# INTRODUCTION

## Definition of environmental education

In environmental education we are concerned with an attitude of mind and not with a curriculum subject. The point has been much stressed in the last decade and is now very widely accepted in discussions of school work.<sup>1</sup> Our survey takes the IUCN definition as its starting point, and it is necessary to be clear at the outset exactly what this implies.

We have to examine with some precision the statement:

"Environmental education is the process of recognising values and the clarifying concepts in order to develop the skills and attitudes necessary to understand and appreciate the inter-relations among man, his culture and his biophysical surroundings."<sup>2</sup>

This definition implies that we are concerned with the cognitive field of acquired new knowledge and also with the affective field of developing new attitudes and values.<sup>3</sup> We should not assume, however, that it is always possible or even desirable to maintain the distinction between these two related areas of education. The definition also implies that when we investigate attitudes we have to pay attention to both individual and group attitudes. It implies that existing attitudes should not simply be replaced by telling students what to think or giving them ready-made judgements.<sup>4</sup> On the contrary, we are concerned with teaching students how to think.<sup>5</sup> This puts a considerable responsibility on the teacher to ensure that environmental issues are given proper coverage to make the formulation of new concepts and values possible by the discovery method. These ideas have recently been the subject of policy decisions and papers in some European countries.<sup>6-9</sup>

## Definition of environmental interpretation

Environmental interpretation is the art of explaining the relationship between man and his environment to the general public in order to increase environmental awareness and to awaken a desire to contribute to environmental conservation.<sup>10</sup> It most usually takes the form of interpretation of a specific location. In cases of this kind we would add to the definition the extra objective of increasing the public's awareness of the significance of the site visited and their desire to conserve it.

How then do environmental education and environmental interpretation differ from each other? And what features do they have in common? They are both concerned with recognis-

ing concepts, values and developing attitudes, though interpretation puts the stress on the last of these, and environmental education is more concerned with the development of skills. We shall list groups of these skills in the next section.

The school group can be prepared in advance of an urban or countryside visit, and is often able to spend hours and even days examining base maps and preparing identification keys. The field of environmental education uses methods of teaching which are usually based on problem-solving and the discovery or heuristic method. None of these characteristics is necessarily true of environmental interpretation. Family parties and adult visitors come to an area for recreational experiences and we cannot assume knowledge or preparation on their part, nor do we know how long they will stay with the interpreter or whether they will make use of opportunities for follow-up even when these are provided.

When children are amongst the groups receiving environmental interpretation they are (by definition) accompanied by adults in family parties and not in organised school parties. Interpretation to children in these circumstances is therefore not the same as environmental education for an organised school party. Indeed interpretation facilities are not usually designed for use by schools in the first instance, as they have to put across a message about site significance and site conservation in a very short time. Hence they cannot use discovery methods to any great extent. Interpretation attempts to provide facts and "answers" which will help visitors to formulate their own attitudes; whilst it often poses questions, it cannot leave groups to solve these questions unaided. There are some questions which have to be answered immediately if the visiting group's interest is to be maintained. Such an approach is not suitable for school learning situations and it may be that in such cases interpretive facilities should actually be avoided by schools unless they have been specifically modified for their use. This point will be discussed again when we look at interpretive facilities in facility type 7.

The interpreter has therefore to establish a rapport, motivate the visitor and communicate a message quickly, and this calls for some dynamic presentation techniques. Unlike an environmental education teacher, the interpreter is less concerned to teach a wide range of basic skills. Nevertheless, with adults the interpreter has the advantage of being able to employ a multidisciplinary approach which makes use of the total adult experience of the visiting group. Obviously

1. The references are printed at p. 17.

if interpreters ignore this fact they not only waste opportunities but possibly are in danger of insulting the group's experience or intelligence.

### **The skills of environmental understanding**

Environmental education in schools can be divided into three main learning stages or steps. Using Phenix's terms<sup>11</sup> we can identify the component elements of each step as skills of environmental understanding. To this we shall also add another perspective by examining the assumption that each step makes about the environment. We therefore pose the question: what is the attitude of the educationist to the environment, characterised by each of the three steps?

The first step employs a single subject discipline to develop the following skills:

- a. writing, drawing, painting, photographing, measuring and surveying etc., in order to record data about the environment;
- b. devising hypotheses, testing them and employing elementary scientific method;
- c. the skills of percipience;
- d. the skills of inter-personal relations which arise from group work.

The assumption made by this first step in environmental work is that the resource is simply a reservoir of teaching material to be used for the particular educational activity. For example, teachers may use a pond for biological activity, a treescape for painting or a river valley for geographical field analysis.

We need to go beyond this stage of environmental education, and the second step focuses attention on a specific locality and attempts to examine its character. Such studies are usually beyond the capacity of a single subject discipline and are most effective when treated as interdisciplinary field work. Integrated studies of this kind introduce an important fifth ingredient:

- e. the skills developed through integrated studies which demonstrate the inter-relationship between man and his biophysical surroundings.

This step is an advance on the previous one in that the environment is no longer regarded as a reservoir of teaching material, because this view encourages the student to think of it as a unity which should be understood. But even understanding is not the whole answer to our present-day needs, and yet another stage is required.

### **Environmental awareness and appreciation**

The third step goes beyond the interdisciplinary work of the second and is multidisciplinary in that it employs a whole variety of disciplines where the main link between these disciplines occurs in the environmental work itself. It is a

more complex stage because it is essentially concerned with change — the nature of change, the rate of change, the impact of change and the consequences of change. It is possible to take this step either through an ecological approach or through the approach of regional ethnology.<sup>12</sup> Both of these are concerned with the importance of time and space and evolution of landscapes and habitats, past, present and future.<sup>13</sup> We move forward from the synoptic view of the second step and add to this analytical work a synthesis which composes a more realistic view of environmental problems. In so doing we add the last of Phenix's list:

- f. ethical, by which we mean an awareness of needs and obligations which help in the formulation of codes of behaviour and a sense of responsibility towards the environment.<sup>14</sup>

This multidisciplinary step takes us beyond the point where we regard the resource as a reservoir for our use, or as complex phenomena which should be understood, to the point where we develop an awareness of the resource's significance.

We experience the environment through our physical and mental senses, and in attempting to describe this perception we come across semantic problems which can be simplified by metaphor and analogy but for which we do not have any well-established terminology. To overcome these problems for the purposes of our discussion, we propose to divide perception of the environment into three stages of perception or appreciation which are usually experienced sequentially.

Percipience is the first stage of perception. It takes the form of that immediate type of perception of stimuli, when images or sounds first make an impact on our physical senses. The impact occurs in a fraction of a second. We sense the stimulus before we enter any mental state of asking questions about its meaning, hence we are dealing with an affective rather than a cognitive area. For example, the experience may simply take the form of perceiving that an object exists when we are about to walk into it. We do not, in that split second, consider whether it is a lamp post! A slightly different example is when we see familiar images presented in a new way — a series of colour transparencies of natural forms is a case in point. This second example is a form of aesthetic percipience or revelation, and such experiences are usually emotional and can have a dramatic impact which we may find inspirational.<sup>15</sup>

Understanding is the second stage of perception, which is very different in character from the first. After the first impact of a stimulus, we may pause to consider its nature by attempting to recognise, identify, name or label the stimulus. To do this we pose questions and enter the cognitive field of knowledge. We are able to

exercise skills and appreciation (of a type not found in perception) as we draw distinctions between intrinsic qualities of the objects stimulating our senses. Appreciating the environment in this sense means placing a qualitative value on what is seen or heard<sup>16</sup> and is a form of recognition of intrinsic qualities. But it is essential to realise that such evaluation is expressed in terms of cognitive knowledge which precisely describes the qualities. For example, we appreciate pine woods if we understand how the pine species differ, how the dominant tree species is associated with different plants in different types of pine wood, and what this means. The value of the trees in the environment could be assessed in relation to their value as a crop, as shelter, as contributors to a hydrological cycle and so on. Such an evaluation is cognitive rather than affective; it is possible to avoid discussing attitudes to pine woods or the ethics of selling large areas of native pine wood.

Awareness of the significance of the environment takes us to a further stage of perception, and considers both cognitive and affective areas. Like the last stage it is also concerned with values and appreciation, but in a quite different way. Because environmental awareness looks at the total environment of a locality, it contributes a framework for other types of evaluation and helps to give us aesthetic, scientific and ethical attitudes. Although, as we shall see later, awareness requires study of a multidisciplinary nature, it is not necessarily an academic approach solely achieved by book learning. This is because our objective in environmental awareness is not the achievement of the specialist expertise of the curator or collector. Our approach regards every man as a curator of the environment, and we have to communicate significance without necessarily presenting all our findings.

This essential difference between understanding and awareness can clearly be appreciated if we imagine a student who understands that a particular plant is extremely rare and knows a great deal about its biology and geography and then proceeds to pull it out by the roots, because the student does not have an awareness of its significance and the need to leave the plant where it was found.

### **Objectives in environmental education and interpretation**

Karl Popper has drawn attention to the futility of defining terms on the grounds that far from clarifying issues, this process merely produces further terms which then need to be defined.<sup>17</sup> This depressing issue is one which causes some concern in discussions of environmental education. Whilst we are not seeking consensus views, we nevertheless need clear pointers for future action. We have seen that there are several stages in environmental education and the steps just

described demonstrate that when workers say they are engaged in environmental education, they can mean quite different things.<sup>18</sup> With almost breathtaking simplicity, universities generally regard environmental education as being synonymous with environmental science. There may never be agreement over questions of definition but there does seem to be a general view that environmental education for schools and environmental interpretation for family groups can be distinguished from other forms of education by means of their objectives, not by any one objective but by a combination of all the objectives. We can put this another way by asking, what kind of environmental awareness do we think our students should have? Having stated it, we then have the possibility of attempting to measure the effectiveness of this work through a system of research and evaluation.

It is possible to discuss objectives and aims at several different levels in environmental education, just because it is not a single subject discipline and is concerned with developing an attitude of mind. Objectives such as familiarising students with living things, or discovering inter-relationships in the environment are technically not our overall objectives in environmental education.<sup>19</sup> For convenience we can consider our primary objectives in three main groups: those concerned with man's attitude to nature, those concerned with the relationship between populations and resources, and those concerned with a general conservation ethic.

#### *Attitudes to man and nature*

Our students have to be aware that man is part of nature and is dependent upon nature, and yet even that statement is anthropocentric. Man has always thought of himself as "special", but he must understand exactly how he is dependent and interdependent. Ecological approaches give much insight into this question, and ethnological approaches complement them by tracing man's impact on his environment through time.

Subsidiary objectives which might be added to this group are awareness of the need to have respect for living things and the natural environment, and the ability to recognise anthropocentric thinking which pays no regard to man's dependence on the proper functioning of the biosphere. There should also be awareness of environmental qualities, the signs of their degradation, and the ability to recognise types of thinking which propose growth at the expense of environmental quality. Lastly, there should be an awareness of the importance of habitats and threatened species, together with an ability to recognise activities which take no account of cause and effect in these environmental terms.

#### *Attitudes to population and resources*

Our students have to be aware that the populations of our planet are dependent upon the resources

available. When we speak of overpopulation or the need to stabilise populations, we are speaking of a relationship between population numbers and the capacity of resources to support them. We can only fully understand this problem if we look at a long enough period of time to study growth rates, and at our global situation, to study the crisis situation. There should therefore be an awareness of the fact that this problem is only capable of solution on an international scale.

Some observers have taken an extreme anthropocentric view, regarding resources simply as the raw materials of industry and food products, including fuel supplies. The environmental journalist's term "life-support system" means all the cyclical processes at work in our atmosphere, biosphere and lithosphere. These include the inter-relationships between solar energy, air, water, rocks and minerals, soils, plants and animals, including man. The ecological approach gives us an awareness of how these processes evolved and the ethnological approach contrasts the relationship between population and resources, past and present.

Subsidiary objectives in this group are an awareness of the need to conserve resources and recycle our existing stocks, and an ability to recognise those human activities whose impact on the environment is unconsidered, unmeasured and unchecked and which can often lead to over-use of resources. It follows that there should also be an awareness of the folly of wastage, the mis-use of the earth's resources by all forms of profligate use and pollution. There should be an ability to recognise the mentality which fails to count the ecological, economic and social cost to present and future generations of certain types of growth.

#### *Attitudes to conservation*

There should be an awareness of the need for conservation of resources of all kinds for future generations to enjoy. Ecologists and ethnologists can give substance to this ethic in numerous ways. To take but one example, if exploitation of non-ferrous metalliferous minerals continues at the present rates of extraction, all known deposits could be exhausted within the next century. This means that children of the pupils we teach today will have to live in a world in which recycling is the norm.

#### *Environmental codes*

We have seen that environmental education and environmental interpretation have identical objectives but deal with different publics in different ways. Whilst working towards an environmental ethic we meet a special problem raised by age and experience. Pupils studying environmental education will most certainly lack the experience to achieve the ultimate objectives during their school careers; adults, despite their greater experience, may only be reached by mass media and environmental interpretation with a consequent lack of

any planned or programmed curriculum. This argues for more community environmental education and also for the formulation of ready-made basic attitudes in the form of a series of environmental codes of behaviour.

It can be argued that distributing such codes is a propaganda exercise, and is thus in conflict with our educational objectives. Nevertheless we have to provide some codes of behaviour and in practice the problem is not as serious as it first seems to be. The main points of such codes will not be controversial and they are drawn up in the interests of public safety and enjoyment. The United Kingdom codes for mountain safety, water safety, outdoor studies and the countryside, to name but a few, do not touch on deeper ethical issues. They are designed for those who have not had the opportunities afforded by environmental education and environmental interpretation which communicate the more fundamental background and which help the individual to formulate his own environmental ethic.

#### **Multidisciplinary approaches: ecology and regional ethnology**

In learning environmental skills (aesthetic, symbolic, synoptic or empirical) we employ several disciplines and interdisciplinary techniques. There must be a further educational stage in order to achieve what we have termed environmental awareness, and we have seen that this stage should shift from the analytical to the formulation of a synthesis, or an ethic. Such a stage must be concerned with the total environment and therefore it needs to be not merely interdisciplinary but multidisciplinary.

There are two practical ways of studying man and his environment in these terms. The first is the ecological approach which looks at the relations between living organisms and their environment and puts the emphasis on the biophysical aspects of the dynamics of change, the extent to which individuals and species are dependent upon dynamic forces, and how far species can adapt to environmental changes without being destroyed. The second approach, which is regional ethnology, also studies man and his environment, but does this through the individual and the community. It puts the emphasis on traditional ways of life and shows how these are altered and affected by innovation, by different rates of change or diffusion of ideas. It explains why some cultures are more mobile or resistant than others, and how changes are introduced. Ethnology studies what is actually happening when social changes take place and whether the changes are significant.

It will be seen, therefore, that ethnology throws light on an area of environmental education which is very similar to that illuminated by ecology — the dynamics of change, the survival of communities, and the extent to which changes in the environment can be assimilated without



destruction of the community or the species. In practice the ecologist very rarely progresses his biological studies of living organisms to include all the implications for man. Likewise the ethnologist rarely progresses his studies to take account of all the biophysical relationships which exist in the milieu. Consequently we believe that both approaches are necessary and are complementary.

It is very difficult to understand environmental changes today without some knowledge and understanding of the effect of modernisation and recent innovation. It is for this reason that the study of the traditional way of life as a basis for comparison is important. For example, we have to understand what is meant by the word "peasant" if we are to understand the disappearance of the kinship group and the implications this has for our environment. A peasant is an economic term for a farmer who determines the productivity of the kinship group. His objective is not to maximise the productivity of the farm but to maximise the employment opportunities for his family. Consequently he is free to withhold farm products from sale off the farm in order to feed his family, and the economic dictates of the nation have no meaning for him. He belongs to a traditional form of social organisation which has more labour than capital at its disposal, which identifies the farm with the household and which lacks specialisation. It is the only form of social organisation in which kinship and economics are inseparable. Ethnological studies of traditional farming can form a basis for our understanding of a great deal of environmental change which we see around us today.

Suppose we take another more specialised example from comparative ethnology, one which at first sight seems to have little connection with the environment, the difference between fine art and the popular or folk arts. If we visit an art gallery or museum with a party of students we enter an area which has more fundamental relationships with the principles of environmental education than any of the foregoing introductory pages might lead us to believe.

The collectors who have built up these galleries of culture, often as private collections, have divorced the objects from their environments. The objects on display, in a sense, have lost their provenance simply because they are in the gallery or museum. It is true the curators usually have records which show all that needs to be known about their provenance, and the labels may share some of this knowledge with the visiting public, but the fact remains that once an object is put on display in a glass case, it becomes a fine art object, a curiosity and a curio. Folk art on the other hand is not displayed in this way, out of context and out of habitat. It has provenance, it is rooted in the local environment and also in the kinship group. Even those traditional handicrafts of Scandinavia which are

transitional forms between fine and folk art and which owe their special position to continuous traditions and to the continual interaction between fine and folk art, even they show the influence of the kindred group on the outside artist. A comparison of fine and folk art also tells us much about the relationship between man and his environment, for fine art is refined and attuned to taste, it is often collected to stand as a status symbol of the collector's wealth or taste. Folk art is unsophisticated, unrefined, and, by comparison, is unskilled, rustic, rude and by definition popular. Fine art is often the product of known individual artists and craftsmen, whilst folk art must always be anonymous, often a group product and unprofessional, in the sense of not being the product of a "restrictive" guild of craftsmen. Fine art is innovative and its uniqueness often lies in its novelty element, whilst folk art is not unique, it is common, the traditional product of the kinship group. Finally, fine art is urban and cosmopolitan and folk art is rural, provincial, the product of primitives or peasants. So what interests us here then are the links which the ethnologists can demonstrate between work and an environment which is the source of the raw materials, the inspiration and the need to produce the object.

The ethnologists ask themselves why and how people work in a given environment. They look back in time and make geographical comparisons to see the effects of innovation on traditions. The social sciences of economics, sociology, history, archaeology and geography are brought to bear on these multidisciplinary studies of man's material and non-material culture. Open air museums attempt to keep the artefacts of this material culture in their environmental context. Thus in the best of these museums we can see grouped together vernacular buildings and other forms of shelter, and can trace the influence of climate, topography and building materials on their design. We can see lighting materials and fuel and fire and relate these to the landscape. We see the clothing, food and drink, and can relate these to the system of agriculture and soils. With non-material culture, we are concerned with the oral tradition of a community which cannot so easily be symbolised by artefacts and thus requires demonstration. The organisation of work by division of labour, the traditional cures for maladies, the beliefs and forms of worship, custom, folklore, rites and myths, and the traditional pastimes, sports, games, music or ballads — all of these are passed from one generation to the next by word of mouth and song. But it would be a mistake to assume that because they are not objects made from raw materials drawn from the local environment, they have no links with it. These links are indeed present.

To take a third example, if we look at the innovations which have affected traditional

patterns of living in Western Europe we can observe the early influence of the feudal lord and the Church and the effects of incomers, itinerant groups of traders, soldiers, sailors, refugees, visiting priests and schoolmasters, each making a mark. But the modern influences of our own century are of quite a different order of magnitude, for the speed of change and the number of influences have increased phenomenally.

In most cases the influences have been present for a long period of our history, and what is new is simply the sudden explosion of a type of growth. Thus industrialisation and urbanisation are not 20th century phenomena — it is rural depopulation and the drift to the cities that are new. Social welfare and scientific innovation are not new, but the sudden growth in their universal application has recently changed the role of the family, of women in society, of international trade in community organisation, of the state and the dependence of the individual on the state rather than upon the family. The means of transporting goods long distances by wheeled vehicles as part of the business of trade and marketing is not new, but the speed and efficiency with which this can now be done would have been almost unthinkable to our grandparents. This has influenced the mobility of labour, weakened the apprenticeship system, encouraged the growth of the factory system and the need for standardised products. It has turned "travail" into travel and even tourism. Education and communication are not new, but what we see now is a universal system of education, standardised mass media products which package the written word in printed books and magazines by the million, and process spoken words in radio and television for the millions. We have turned much of our entertainment over to these media and to cinema and gramophone records. It is a formula which has had caustic effects on the oral tradition and on regional differences of speech and custom.

It must be stressed that we are *not* saying that these innovations are all bad or that we long for a return to the good old days. Nor are we saying that all changes are inevitable and that any attempt to evaluate them is romantic and nostalgic nonsense, simply because we cannot put the clock back. The ethnologist attempts to assess the effects of changes which have already happened, for many of these changes may have gone unnoticed. He also considers what is happening now, how our way of life has gradually lost contact with natural environments, how we have come to accept synthetic and exotic raw material as a matter of course, how the corn-grower has become the bread-winner, and how this has implications for us all, for man, for his future. This is also what the ecologist is attempting to tell us, but he uses a different language. He considers the effects of systems of organisation which ignore the fact that man is part of nature, which is the same thing.<sup>20</sup>

### **Learning environments: the concentric system**

Environmental education begins in the home area and works from the school classroom through the local resource area, school gardens and urban parks to move out concentrically from the school itself. This centrifugal movement is charted by the survey, and in it we see a kind of spectrum of facilities and opportunities.

These range from the local to the remote area, through botanical gardens, zoological gardens and national museums and so to their rural equivalents — the landscape gardens, wild-life parks and open air museums. Some countries have identified a lack of facilities available for environmental education which is due neither to lack of powers nor to lack of resources. It results from a failure to identify and realise the educational potential of the existing facilities, or from a lack of co-ordination. Where there are few resources, there is often a pressure of educational use on the resources which are available. Facets of this problem can be seen in the survey results in several different guises, and we shall now describe key issues which are related to this major problem of co-ordination.

It makes little sense for a child in an urban school to begin studies of his environment in a place remote from his school area. Yet this situation is not uncommon. For example, schools visiting national parks in England were often found to be making their first fieldwork excursion of any kind. This practice puts a considerable pressure on park staff and local experts who become inundated with requests to meet school parties. They may be subjected to intrusion from repeated school visits with thoughtless use of questionnaires. The search for first-hand realistic information, more up to date than any textbook, more relevant to current conservation problems than any newspaper story, stems directly from environmental education's quite proper insistence on fieldwork techniques, with their superiority over second-hand evidence and experience. Unfortunately the pressure on the area and the local people can lead firstly to a booking system, then to the provision of second-hand information to answer the students' questionnaires, and eventually to restriction of the educational use of the area altogether.

We need therefore to decide what can properly be taught in the field and in the classroom, how best to prepare students through local studies for visits to more distant terrain, and how to co-ordinate the use of facilities. The grammar of field observation should be learned in the school area, not on the visit to distant areas when time is at a premium and should be used to learn new concepts and discover new attitudes. The concentric system makes sense because there is better conservation of areas, better conservation of experts, a better chance of finding first-hand data in the long term, a better educational progression from known to unknown as a basis

for comparison with other environments, more realism and relevance to the student's experience and hence less escapism, a better use of time spent in the field, and a greater likelihood of better preparation and follow-up work in general. The spectrum of facilities gives the greatest possibilities in those fieldwork methods which employ discovery techniques, seek to involve students in environmental problems and suggest forms of practical participation for the home area. The opportunity for a student to develop a certain proprietary sense about his home environment, become aware of local environmental problems, understand how they might be solved and also have a chance to do something practical, is most important for both rural and urban students. It has more to offer environmental education than "outings" which are unrelated to a student's previous experience.<sup>21, 22</sup>

### **Urban and rural**

This brings us to a major issue of the concentric system: the dichotomy between urban and rural. There has been a recent development of the philosophy which considers that drawing a distinction between rural and urban is unrealistic, irrelevant or meaningless; this view is often expressed by planners who are urban-oriented or strongly influenced by social and economic considerations. For example, some planners define a "region" as a sphere of economic and social influence around town or conurbation and they speak not of town and country planning but of urban and regional planning. For them the main concern is to know where the population go for their consumer goods, schooling, entertainment and the like. From such data the links between the region and its urban centre can be planned. The distinctions can be deliberately blurred by planned action: in other words planners holding this view can make it come true!

But it is an attitude which begs a major question. Urban and rural land uses are not the same. Urban thinking applied to the rural area results in the disappearance of the rural area's qualities. The alternative view of the region is to see it as an area that has characteristics, a personality even, directly related to its milieu or environmental factors. These could be mapped and defined, and one can then attempt to keep some of the qualities without slavishly following the past. Thus modern architecture can draw strength from the vernacular without rustic imitation, and can take its inspiration from local and natural forms, materials and site factors. The rural village with standardised urban concrete kerbs, wire fences and a dormitory housing estate in suburban style, is the product of urban thinking and formulae which are divorced from the landscape.

It makes no sense in environmental education to accept placidly the urbanisation of the countryside and to pretend that rural areas are simply potential sites for urban development. Never-

theless, the proponents of the urban view base many of their arguments on a quite justifiable critique of what might be called the cult of the countryside. A few examples should suffice to illustrate this. Love of countryside is of recent origin, little more than two centuries old, indeed the words "rural", "pastoral" and "countryside" have changed their meaning considerably in the last 400 years. Pastoral once meant the place where food was produced, and much of our verdant landscape today is still a fodder factory. Countryside in the 18th century became an essential part of the romantic movement and could be classified into landscapes beautiful, sublime and picturesque. The worship of nature was an aristocratic affectation at a time when the agricultural artisan had no special "love" of countryside.

Some of the more extreme forms of urban thinking have now found their way into environmental education to advocate the use of the local urban areas, not as starting points, but as self-contained entities. Whilst it is possible to effect environmental education in this way, there is the ever-present danger that it will produce an inadequate understanding and awareness of the total environment. It will also depart considerably from the IUCN definition of environmental education, which has nothing to do with romanticism or escapism and is certainly not irrelevant. Urban environmental issues of local relevance and importance are certainly worthy of priority consideration but if we over-emphasise urban pollution, beautification and town conservation at the expense of all else, their relevance will have overridden the realism which we seek and many of the strictures applied by the critics of rural fieldwork will rebound on them.

Clearly then there is a need for some balance, hence the reason for a spectrum of facilities and its centrifugal use, starting in the home area and working outwards. We must go back to the objectives, derived from our definitions: awareness that man is part of nature, awareness of the relationship between populations and resources and awareness of the need to develop a conservation ethic. This can only be effected by the employment of both urban *and* rural studies. In land-use terms we are concerned with the impact of man and the impact of urbanisation and the conflicts that these give rise to. We need to look at the effects of changes, to see urbanisation for what it is, to examine the advantages and disadvantages of concentrating our populations into large cities, and not just to take cities for granted as the environments in which most of us have to live. Only by such an approach are we ever likely to get the cities we need in the future, instead of the cities we thought we wanted.<sup>23</sup>

### **Simulation of realism**

The twelve types of facilities which are examined in the later sections of this report raise a general question of the extent to which reality can be

simulated. This in turn raises other problems of definition which are central to our discussions.

Realism means true to nature or the natural world — but what do we mean by the natural world? In the context of environmental education and interpretation, suppose that we consider a specimen of animal bone; it is natural but the realism we aim to achieve is a more dynamic type of fidelity. We seek to understand and appreciate the total environment of a site, not merely a fragment of it. So we see more opportunities for environmental education in facilities which present animals in their "natural" habitats than in those facilities which do not, though we recognise the value of both.

The bone requires flesh. We want to know more about the appearance of the whole animal, how it lived in relation to other animals, its provenance or where it once lived and what kind of environment that was. To effect this for a bone requires the application of simulation techniques, at least if we are to communicate the message. Such techniques consist of steps towards reality, steps which must be authentic, genuine and trustworthy, and yet they may also be imitations of reality and, in a sense, a pretence. This is just one of the dilemmas of simulation.

Simulation follows a progression towards realism, employing collections as aids which we call communication media. These media collections can be either two-dimensional (e.g. audio-visual images) or three-dimensional (e.g. specimens, artefacts, models, reconstructions, or collections of living things displayed as media).

Media can simulate realism in one of two ways, in environmental interpretation:

a. They can put objects back into their context or habitat by reconstructing the scene with as much realism as possible (e.g. life-size

dioramas, wildlife parks, habitat gardens or open air museums);

b. They can make objects come "alive" by animation techniques which cause them to move dynamically (e.g. working models, working machinery, demonstrations and re-enactment of events).

Thus if an object in its natural state is or was alive, we have to take the specimen which represents that reality and animate its dead, lifeless, moribund or inert state, to some degree. If an object usually occurs in a particular habitat but is out of context, then we have to bring it to a more realistic state by putting it back into that context, to some degree. Our objectives are to reveal the meaning of the object and to reveal the significance of the site in which it was found.

We can arrange media in a progression, starting for example with a bone, and gradually attempting to achieve different degrees of realistic reconstruction. We are concerned with some important criteria at this point: whether the object is "off-site" or "on-site"; whether the object of interest will be displayed indoors or out; and we must remember that we are inevitably concerned with a collection and not with a piece of field evidence which is still in situ.

The two-dimensional sequence by which realism is achieved may start with a description of the object in words, progress to a drawing of the skeleton and so to a graphic reconstruction of the animal, then to a photographic print and finally to a movie film of the animal in its habitat. The three-dimensional sequence might start with a specimen of bone, progress to a model of the animal, thence to a reconstruction of the whole skeleton, from a stuffed animal to a life-size diorama of the entire animal in its reconstructed habitat, and finally to the living specimen in a wildlife park. The end of both sequences is the animal in its natural habitat.

### Survey classification of environmental education and interpretation facility types

A	B	B/C	C
Fieldwork or field experiences	Collections of authentic specimens without other media	Collections of authentic specimens plus other media	Simulation of reality by media without specimens

#### On-site facilities

##### Indoor facilities

Residential facilities 8, 9, 10	Site museums with no other media 6	Site museums with other media 6	Visitor centres 7
<i>Combination of indoor and outdoor facilities</i>			
Urban sites 1	Site museum and combined field trip 6	Habitat garden and other media 3	Interpretive plan combining field and centre 7
Field laboratory facilities 2-5	<i>In situ</i> open air museum: no other media 6	Wildlife park and other media 5	
Work camps for conservation 11		<i>In situ</i> open air museum and other media 6	
<i>Outdoor facilities</i>			
Rural sites 8	Habitat gardens: no other media 3	Wayside exhibits & other media 6	Outdoor interpretive signs, audio devices 7
Trails & view points 12	Wildlife park and no other media 5	<i>Son et lumière</i> 6	Guided services 7
	Wayside exhibits 6		

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## Off-site facilities

<i>Indoor facilities</i> —	National and regional museums: no other media 6	National & regional museums with other media 6	Media resource centre, research centre, television centre, training centre, exhibition gallery, lecture service, library, educational or interpretive planning service 11
<i>Combinations of indoor and outdoor facilities</i> —	National and regional open air museums: no other media 6	National and regional open air museums with other media 6 School garden service with media and loans 1 Botanical garden with other media 2 Zoological garden with other media 4	Imitative experiments and interpretive research 11 Voluntary work for conservation headquarters 11
<i>Outdoor facilities</i> —	School gardens: no other media 1 Botanical gardens: no other media 2 Zoological gardens: no other media 4	—	Outdoor media collections 11

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## Definitions of facility types in environmental education and interpretation

1. a. *School garden services*: collections of living specimens in urban school areas used for supervised school activities in environmental education.

1. b. *Urban resource areas*: urban field study sites including parks, used in fieldwork and supervised school activities in environmental education or in environmental interpretation for the general public.

2. *Botanical gardens*: collections of living plants arranged systematically which give opportunities to study the diversity of environments.

3. *Landscape or habitat gardens*: collections of living plants arranged in rural habitat groupings which give opportunities to study the diversity of the living landscape and the interdependence of air, water, soil, plant and animal life, including man.

4. *Zoological gardens*: collections of living animals arranged systematically which give opportunities to study the nature and variety of animals, their biology and behaviour, and which help to stimulate an awareness of the relationships between man and animals and their environment.

5. *Wildlife parks*: collections of living native animals arranged in natural or semi-natural rural enclosures which give opportunities for the observation of the nature and variety of living things, their biology and behaviour, and which can be used to stimulate awareness of the relationship between man and animals and their environment.

6. *National museums*: collections of specimens and artefacts which can illustrate the principles of environmental topics and offer opportunities for comparative studies in environmental education.

7. *Interpretive centres and provisions*: collections of media or artefacts, simulating reality and linked to the immediate site, to demonstrate the significance of that site and the need to conserve it.

8. *Countryside day centres*: rural field study sites and centres used for environmental education and environmental interpretation with facilities designed for day use.

9. *Countryside residential camps*: accommodation for school parties used for environmental education field work with staff provided by the visiting school.

10. *Countryside residential field study centres*: accommodation for school and adult parties for environmental education field work with permanent residential staff and, essentially, providing classroom and laboratory facilities.

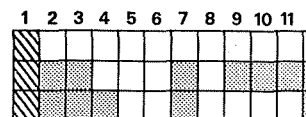
11. *Special centres*: centres designed for experimental research and demonstration including practical workshops or work schemes, training courses and imitative experiments for environmental education.

12. *Interpretive and environmental education trails*: guided or self-guided routes programmed through urban or rural areas or facilities with predetermined observation stations or viewpoints which give opportunities for first-hand study of inter-relationships in the environment, or which stimulate awareness of site significance.

**School garden services and urban resource areas**

- 1.1 National Association of School Gardens
- 1.2 The Hague School and Children's Garden Service
- 1.3 Glasgow Parks Nature Conservation Section

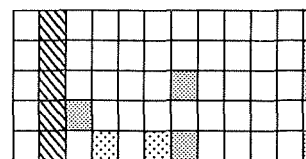
Denmark  
Netherlands  
UK (Scotland)



**Botanical gardens**

- 2.1 Tårnby
- 2.2 Montpellier
- 2.3 Berlin
- 2.4 Hanover
- 2.5 Edinburgh

Denmark  
France  
Fed. Rep. of Germany  
Fed. Rep. of Germany  
UK (Scotland)



**Landscape or habitat gardens**

- 3.1 Bensheim

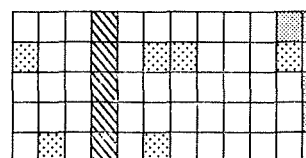
Fed. Rep. of Germany



**Zoological gardens**

- 4.1 Antwerp
- 4.2 Copenhagen
- 4.3 Frankfurt
- 4.4 Amsterdam
- 4.5 Edinburgh

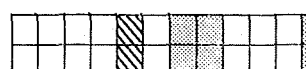
Belgium  
Denmark  
Fed. Rep. of Germany  
Netherlands  
UK (Scotland)



**Wildlife parks**

- 5.1 Deutsche Wildstraße, Eifel
- 5.2 Highland Wildlife Park, Kincaig

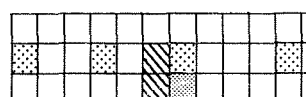
Fed. Rep. of Germany  
UK (Scotland)



**National museums**

- 6.1 Haus der Natur, Salzburg
- 6.2 Copenhagen Zoological Museum
- 6.3 Netherlands Natural History Museums

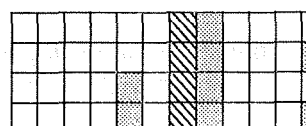
Austria  
Denmark  
Netherlands



**Interpretive centres and provisions**

- 7.1 Esbjerg Fisheries Museum
- 7.2 Marquèze Ecomuseum
- 7.3 Solling Forest Museum
- 7.4 Loch of the Lowes Visitor Centre

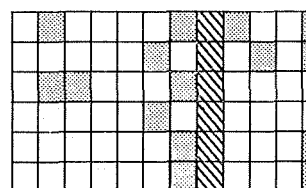
Denmark  
France  
Fed. Rep. of Germany  
UK (Scotland)



**Countryside day centres**

- 8.1 Culzean Country Park
- 8.2 Beaulieu Countryside Centre
- 8.3 Bois de St-Pierre
- 8.4 Slangerup Nature Park
- 8.5. Ballesbaekgård
- 8.6 Wildenrath Environmental Education Park

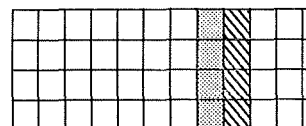
UK (Scotland)  
UK (England)  
France  
Denmark  
Denmark  
Fed. Rep. of Germany



**Countryside residential camps**

- 9.1 Danish camp schools
- 9.2 Irish camp schools
- 9.3 Norwegian camp schools
- 9.4 Swedish camp schools

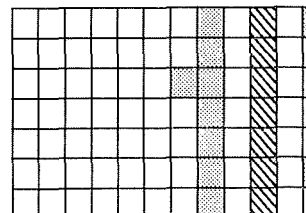
Denmark  
Ireland  
Norway  
Sweden



**Countryside residential field study centres**

- 10.1 Fiskebaekhus Naturskolen
- 10.2 Fussingø Nature School
- 10.3 Permanent Centre for Environmental Initiation
- 10.4 Heiliges Meer Biological Centre
- 10.5 Peak National Park
- 10.6 Scottish Field Studies Association Centre, Kindrogan
- 10.7 Olafsdalur Environmental Education Centre

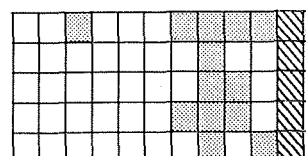
Denmark  
Denmark  
France  
Fed. Rep. of Germany  
UK (England)  
UK (Scotland)  
Iceland



**Special centres**

- 11.1 Løjre Historical-Archaeological Research Centre
- 11.2 Baunatal Environmental Education Research Centre
- 11.3 Zorge Forest Youth Centre
- 11.4 Hollenfels Youth Training Centre
- 11.5 Battleby Display and Interpretation Centre

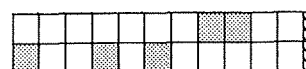
Denmark  
Fed. Rep. of Germany  
Fed. Rep. of Germany  
Luxemburg  
UK (Scotland)



**Environmental education and interpretation trails**

- 12.1 Irish Nature Trails
- 12.2 Horniman Museum Nature Trails

Ireland  
UK (England)



- /// Facility - Characteristic dominant
- Facility - Characteristic subsidiary
- Facility - Characteristic by co-operation between sites

### References

1. Study Group on Education and Field Biology, *Science Out of Doors*, London, 1963.
2. International Union for the Conservation of Nature and Natural Resources, *Final Report: International Working Meeting on Environmental Education in the School Curriculum*, 1970.
3. B. S. Bloom, *Taxonomy of Educational Objectives*, 1964.
4. J. A. C. Brown, *Techniques of Persuasion*, 1971.
5. R. Whitfield, *Disciplines of the Curriculum*, 1971.
6. Committee on Education and the Countryside and Countryside Commission for Scotland, *Education and the Countryside*, 1973.
7. R. W. Colton and R. F. Morgan, *Project Environment: Education for the Environment*, Schools Council, 1974.
8. Scottish Education Department, *Environmental Education*, Her Majesty's Stationery Office, London, 1974.
9. B. Lindgren, *National Environmental Education Policies in Scotland and Sweden*, International Study Conference on Environmental Education in a Rural and Urban Setting, Netherlands, Council of Europe, 1975.
10. D. Aldridge, *Environmental Interpretation*, International Study Conference on Environmental Education in a Rural and Urban Setting, Netherlands, Council of Europe, 1975.
11. P. Phenix, *Realms of Meaning*, 1964.
12. A. Fenton and D. Aldridge, "Environmental Awareness in Scotland: Regional Ethnology and Environmental Awareness; Regional and National Interpretive Plans", *Museums Journal*, Vol. 73, No. 3, 1973.
13. R. Goodier, *Landscapes of the Pedagogic Province*, Society for Environmental Education Occasional Paper No. 8, 1973.
14. R. Nash, *Environmental Ethics*, University of California, Santa Barbara, 1976.
15. H. Osborne, *The Art of Appreciation*, 1970.
16. V. M. Thom, *An Appreciation of Pinewoods in the Countryside*, Native Pinewoods Symposium, Institute of Terrestrial Ecology, 1976.
17. K. Popper, *The Logic of Scientific Discovery* (third edition), 1972.
18. *The Study of Environment in School*, Unesco and International Bureau of Education, 1968.
19. D. Aldridge, "Attitudes to Education for the Environment", *Scottish Centre for Social Subjects Bulletin*, 1976.
20. D. Aldridge, "Folklife Parks as Interpretive Media", Countryside Commission for Scotland (unpublished), 1971.
21. L. L. Sade and E. W. Lee, *Environmental Education in the Elementary School*, New York, 1972.
22. C. J. Troost and H. Altman, *Environmental Education: A Source Book*, New York, 1972.
23. P. G. Carter, *Environmental Education in a Completely Urban Setting*, International Study Conference on Environmental Education in a Rural and Urban Setting, Netherlands, Council of Europe, 1975.





# TYPES OF FACILITY



# 1. SCHOOL GARDEN SERVICES AND URBAN RESOURCE AREAS



*School gardens situated in an urban area.*  
Photograph: School and Children's Garden Service, The Hague.

## Definitions

1. a. *School garden services*: collections of living specimens in urban school areas used for supervised school activities in environmental education.

1. b. *Urban resource areas*: urban field study sites including parks, used in fieldwork and supervised school activities in environmental education or in environmental interpretation for the general public.

The fifty examples of facilities in the survey have been classified into types and grouped according to their most important characteristics. Whilst examples of any one of these types frequently have some of the characteristics of the other groups, the dominance of one factor is rarely in doubt. The chart of facilities shows that if the solid shading, which represents the dominance of the characteristic, and the ruled shading, which represents the presence of subsidiary characteristics, were to be amalgamated into one

single symbol, then the chart could be rearranged in an infinite number of ways. At a glance the whole chart indicates that examples of a type demonstrate considerable variation, and we can observe this by looking at the horizontal columns which give permutations of considerable interest.

Study of the vertical columns in the chart are of less interest, except in the case of type 1. This vertical column shows that there are virtually no other entries in the column apart from the members of type 1 itself (1.1, 1.2, 1.3). This is not the result of design of the chart but derives from the fact that type 1 facilities have a dominating effect on provisions because the municipal authorities provide them for exclusive school use or actively encourage their use by schools, teachers and pupils.

If, however, we were to emphasise in type 1 the presence or absence of such characteristics as classrooms, laboratories or demonstration lessons in environmental education as the hall-

marks of the type, we should then find that the vertical column 1 was transformed.

In practice, type 1 facilities are used with an ecological and biological approach to environmental education. This is true to such an extent that the term "school garden services" is synonymous with biology services. But some teachers have expanded alternative approaches to environmental education in urban school areas. Thus school grounds often include weather stations and urban sites are often used for historical, economic and social activities which we have termed ethnological, wherever cultural comparisons are made about the environment. Nevertheless the archetype here is the School and Children's Garden Service in The Hague (1.2) which, although not the first to be established in Europe, has inspired many other countries to imitate its work which is so firmly grounded in the ecological approach.

We have introduced a subdivision into type 1. The school garden services are by definition always based on this biological work as a starting point, whilst the work of other urban sites may not be so. Type 1. a consists of provisions which are purpose-built or, alternatively, schools have exclusive use of the facilities. The informal sites 1. b can make no such claims, and they also differ from other urban sites by virtue of the fact that they are not normally collections, like botanical gardens (type 2), zoos (type 4) or national museums (type 6). There is however a complication when these latter provide a school service which supplies plant material, animals or artefacts to the school classroom in the same way as school biology services supply material. Whilst we have discounted this feature from our criteria of classification, on the grounds that school biology services provide so much more than just teaching material, it must be admitted that the chart could be developed to show more hybrid forms between types 1 and 2, 4 and 6, and we do not wish to imply that these forms are unimportant. Indeed we use the classification not to become enslaved by rigid columnar form but to demonstrate and discuss just such variations. Many more possibilities exist for future development of this kind and the chart can help to suggest some of these. Type 1 is distinguished from types 3, 5, 7 etc. because it is urban and not rural.

#### **Variations on type 1. a**

It will be seen from the chart that example 1.1 is a single facility sub-type which is in marked contrast to the Hague School and Children's Garden Service (1.2). The latter spans almost a whole range of possibilities with a very comprehensive range of facilities described in detail in the following text. Live animals and human artefacts are introduced into the Hague teaching service's demonstration lessons but we have not

recorded these as zoo or museum facilities. This is because they are not strictly speaking collections. In pedagogical terms the teaching potential afforded by this use of zoo and museum ingredients makes such a distinction relatively unimportant. It will be seen from the detailed accounts of these two facilities that apart from the contrast mentioned above, they also differ in their scale of operations and in number of students taught.

#### **Variations on type 1. b**

With only one example (1.3) of this sub-type, one cannot speak of variations. Glasgow Parks exhibit the same kind of comprehensive approach seen in the Hague service which has strongly inspired several of its innovations. Glasgow Parks' objectives contain a strong social element in addition to the educational aims, and the target public is consequently rather more general. What it lacks in facilities for demonstration lessons it makes up for in the very wide range of subject interest which includes industrial archaeology and history. Glasgow Parks have also developed a unique system of links between the city centre and the surrounding countryside by a chain of walkways which are used for educational and recreational purposes.

There are some urban areas which have been used by schools for environmental studies in a less formal way. Local teachers use urban sites of all kinds for a wide range of studies. Superficially these seem to require no facility provision of any kind, but in reality they often depend on the assistance of many official bodies to provide advice and expertise. This is sometimes regulated by the setting up of urban resource centres for teachers. These act, partly as repositories of data for urban field work and partly as clearing houses for planning courses and assisting teachers to make contact with organisations that also offer help.

#### **Problem issues**

There seems to be considerable agreement between the providers of the type 1 facilities on the matter of objectives. They all appear to be conscious of their special position in relation to the concentric nature of facility use. This takes a number of interesting forms.

a. Urban sites are recognised as the places where most children in industrial countries gain their first introduction to environmental education. The facilities described have to prepare the youth of the community for urban life and awareness of the importance of man's environment, both urban and rural.

b. School grounds give facility providers the opportunity to practice what they preach and set an example in environmental terms. Some providers speak of the day which may yet come, when school grounds and urban areas are so



*Young schoolboy working in the soil with his hands.*

Photograph: School and Children's Garden Service, The Hague.

stimulating and attractive that escape from such environments will cease to be attractive.

c. There appears to be a need to give more careful consideration to the question: what is best taught in the classroom and what should be taught outside it? Indoors, we have such facilities as classrooms, studios, libraries, textbooks and worksheets or reference material and audio-visual aids, specimens and the like, to simulate experience of the outdoor environment. In seeking the outdoor equivalents to these facilities, a decision has to be made on whether to bring them into the school's own resource area and/or whether to take the classes out to these alternative facilities. One has only to think of the specialist expertise required to set up a botanical garden, zoo, museum, forest, parkland, or farm to realise that the existence of any one of these facilities near to a school is an asset of major importance. The cost of taking children to them might be set against the cost of an educational authority providing one for each school, it could be argued. However, this is not the whole picture.

d. There are some schools situated in what have been described as "totally urban settings" and which are completely devoid of possibilities of the kind just mentioned. These schools can make provisions of their own. Another important reason for encouraging this approach is that the element of personal involvement is of importance

and children can be actively involved in making the facilities themselves. The educational result can be more important than a visit to see a facility outside the school. Pioneers in the development of resource areas for schools in urban settings have shown that roof gardens and mini-zoos are possible even on the most limited budgets. It has been argued that urban sites offer more opportunities than rural areas for the study of some kinds of environmental education. The pollution of air, water and land are usually monitored and controlled by organisations whose headquarters are to be found in urban areas. The disposal of waste, the control of river pollution, the monitoring of atmospheric pollution, the problems of power stations and other industrial plant and the way in which towns and cities function, all these give opportunities for teaching environmental education. Indeed, the school itself consumes fuel and produces waste products which can be related to the hinterland and to environmental issues. In this sense, environmental education can be studied anywhere, but what is important is that planned visits should be designed to bring out the issues.

#### *References*

- H. Wals, *Schools and Gardens Service, The Hague*, in International Study Conference on Environmental Education in a Rural and Urban Setting, Netherlands, Council of Europe, 1975.

P. G. Carter, *Environmental Education in a Completely Urban Setting* (as above).

P. G. Carter, "Living Things in Towns", *Teacher*, June 1967.

Central Electricity Generating Board, "Field Studies on Power Station Sites", *CEGB and Wayleave Bulletin*, No. 11, 1970.

S. A. J. Olham, "Urban Parks", *Education and the Countryside*, Committee on Education and the Countryside and Countryside Commission for Scotland, 1973.

R. W. Colton and R. F. Morgan, *Project Environment - The School Outdoor Resource Area*, Schools Council, 1974.

B. Scriven and L. Clipson, *Planning the School Site Research Project*, Institute of Advanced Studies, Manchester Polytechnic, Environmental Education Monograph 3, 1974.

E. A. J. Buckhurst, "School Grounds - A Resource for Teaching Environmental Studies", *Bulletin of Environmental Education*, No. 35, March 1974.

### **National Association of School Gardens**

#### **1. Landsforeningen "Skolehaven" (National Association of School Gardens)**

##### **2. History, development and objectives**

The association was founded in 1903 as a private association. On a journey in the Styrian region of Austria in 1901, P.W. Lindholm, a teacher in municipal schools, saw school gardens of this type, and decided to adapt the idea to Danish conditions. In 1904 Copenhagen opened its first school garden, with Lindholm as the head of the facility, after the Copenhagen municipal authorities had approved the project. The aim was to let each individual child cultivate his or her own small garden throughout the summer and see the seeds germinate, the flowers unfold their blooms and fruit ripen in beautiful surroundings where the children would be given healthy upbringing and proper instruction.

In accordance with the Schools Act of 1958, school gardens activity can be included in the educational curriculum, but instruction given in such gardens normally constitutes a leisure pursuit. The school gardens movement spread throughout the whole country, and reached its culminating point during and just after the second world war, by which time there were over 200 school gardens in Denmark. At present school gardens are experiencing very difficult conditions. This is partly because the financial appropriations are, in many places, being subjected to severe cuts, and partly because it is very difficult to find people to run the gardens, since many teachers feel they will be tied down to this work throughout the whole summer, and they prefer to enjoy their leisure time uncurtailed. Consequently, many school gardens have been closed down in recent years and few new ones are being established. The national association is making efforts to bring about a change in these circumstances.

The association is working on a project to make school gardens activities more up to date

by introducing to an increasing extent environmental and ecological studies in the instruction provided.

##### **3. Habitats**

Town areas and the outskirts of cities.

##### **4. Organisation, administration and description**

Landsforeningen "Skolehaven" is a private association with an elected board, a Chairman and a Treasurer. The association's members are the heads and members of staff of the individual school gardens. Not all school gardens belong to the association, however. The individual gardens have between 20 and 300 children as members. In Copenhagen, the twenty-five school gardens have approximately 4 000 children participating.

The heads of the school gardens, and in some cases their helpers, who are in most cases often teachers from the local schools, supervise activities in the individual gardens. These gardens accept children aged between 8 and 9 years or older, as a rule for two hours a week in the months from April to October. The children's gardens are between six and ten square metres in area, and between 16 and 50 children at a time receive instruction.

##### **5. Finance**

The children often pay an entrance fee and also, in some cases, pay for seeds and plants. The land is made available by the local municipal authorities, who also pay for the teachers' salaries, garden implements and upkeep. In Copenhagen, this amounts to approximately Dkr 600 000 each year.

##### **6. Publications and documentation**

Over the years, a whole range of publications has been issued in Danish on the work carried out in the school gardens. A report on the school gardens service in Denmark is given in *Beretning om Skolehaver i Danmark*, pp. 9 et seq.

##### **7. Address**

The present Chairman is Asger Fog, Svend Gøngesvej 1, 2700 Brønshøj, Denmark.

### **The Hague School and Children's Garden Service**

#### **1. The Hague School and Children's Garden Service**

##### **2. History, development and objectives**

The service was founded in 1919 by the Municipal Board of The Hague. The city's Service for School and Children's Gardens was originally involved mainly in school gardening projects which was seen as a means to one end only — the happiness and well-being of the child. However, after World War II the scope of the service was enlarged as the population increased rapidly, industry expanded, there was greater use of chemicals, and all these profoundly disturbed the natural environment. Moreover, between 1948 and 1970

the concept of protection of nature began to emerge strongly in close relationship to these new threats to the environment on the one hand, and an increasing interest in ecology on the other. These changes had consequences for the work of the service.

In the beginning, the accent lay on the contribution of the individual pupils — not damaging plants, not killing animals, careful disposal of waste. Later, the service attempted to help the student understand the changes in the environment which appear catastrophic, are caused by man and are changes for which man has a responsibility.

There are sixteen such services in the Netherlands at present, and financial support from the government is expected in the near future for those towns which are willing to plan a school biology service.

The service is based on a number of important general educational principles:

a. Learning should be real, compelling and valuable to the student, should engage his active participation, and should confront him with significant challenges leading not only to deeper and broader awareness and insight, but also to more discriminating attitudes to the environment;

b. Successful teaching requires that learning should be as meaningful as possible and give the student insight into the reality of environmental problems by bringing him into contact with living nature, because therein lies the heart of environmental education;

c. In order to answer students' questions on the environment, the field of environmental education must be broad and calls for a multi-disciplinary approach which involves all the classroom skills. The task of the Service for School and Children's Gardens as a specialised teaching body in this connection is to offer support to the teachers. Every school in The Hague is given a choice of courses centred on their environmental area. In accordance with the service's stated objectives these courses are focused only on the living environment. The activities of the service complement and illustrate the classwork, and it is for this reason that the lessons in the service's programme are limited to areas which teachers cannot cover themselves, either because of lack of specialised knowledge or because they do not have access to the type of material which the service can supply;

d. Nature must not be shown to the students, they must discover it for themselves;

e. What the students experience is more important than exercising the power of memory;

f. Remembering the experience is worth more than remembering what is being learned;

g. Seeking inter-relationships must replace the repetition of facts.

As an example, two of the facilities made available are described in more detail.

### *School garden work*

In The Hague, there are two types of gardening for children: gardening during school time and gardening after school time. Each of these forms a practical way of giving biological education. The only difference is that after school hours gardening falls into the framework of a hobby or leisure activity, while during school hours it is part of the course of study and curricula. During the school gardening period, attention is paid to such matters as soil, native flora and fauna and food chains. After the gardening sessions, evaluation of the experience takes place in the school. This is one way of meeting the urgent need for both students and teachers to have immediate contact with living plants and animals. Since 1971, nursery schools have been included in the school garden projects. There young children have a chance, from about 5 years of age onwards, to sow seeds in their own special garden plots and to care for plants and small domestic animals.

### *Demonstration lessons and excursions*

Demonstration lessons are given in special purpose-built demonstration buildings. The purpose of the lessons and the excursions is not to confront students with facts but to give first-hand knowledge of the variety of plants and animals in their own environment, recognition of the interdependence of soil, atmosphere, plants as producers and man and animals as consumers. The lessons also aim to give an ability to identify and explain a biological community in relation to its environment — a concept of the food chain and ecological balance.

The active participation of students in the learning process is encouraged during the lessons and excursions. Evaluation in school is assisted by means of worksheets which give both a summary of the lesson and detailed assignments.

### *3. Habitats*

Urban areas.

### *4. Organisation, administration and description*

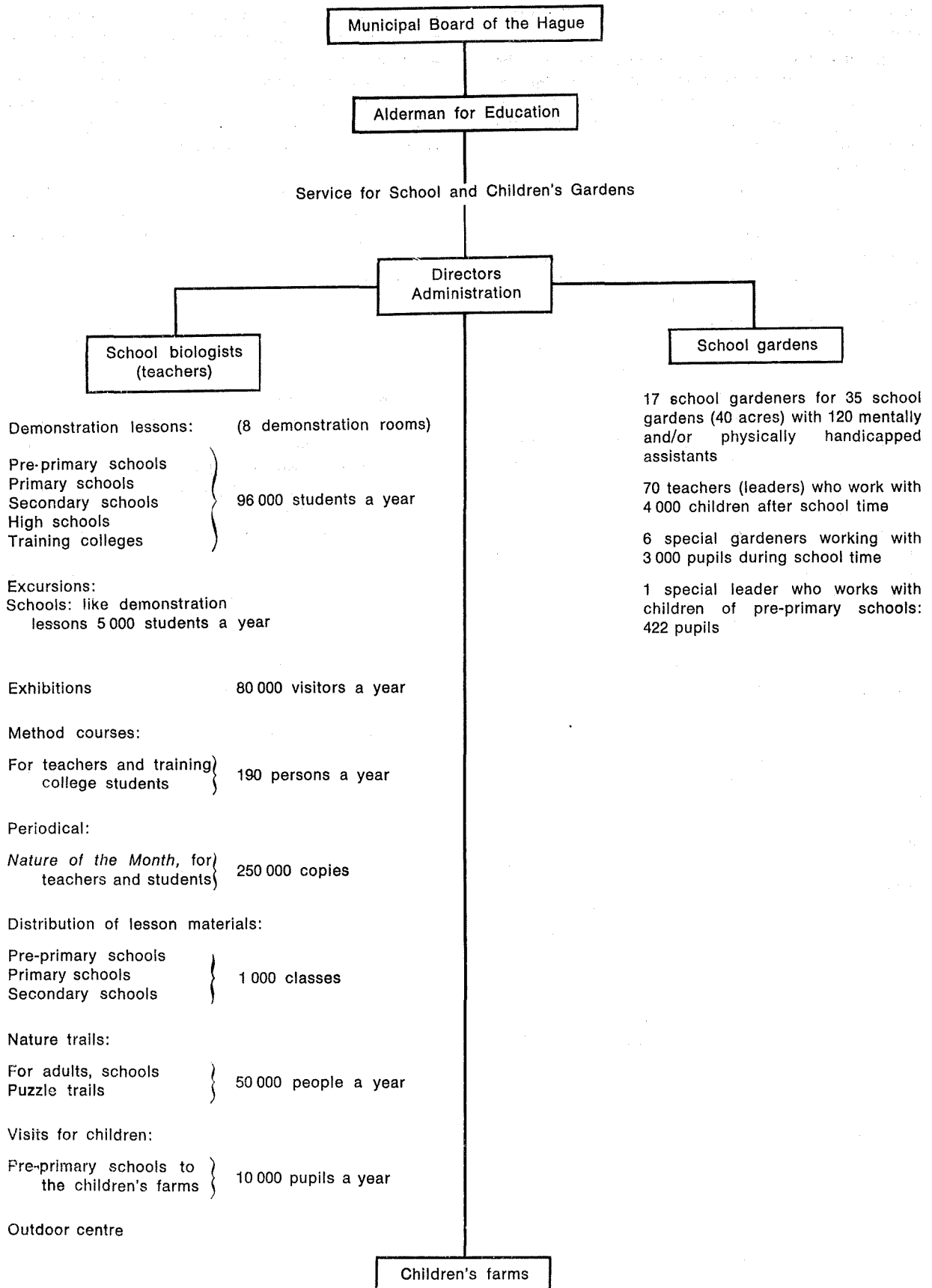
The organisational chart gives details of the administration and use of the service's facilities. These services are offered free of charge, and transportation by coach for those pupils living in the middle of the town where the opportunities for this work are minimal is also made available. The service caters for children from about the age of 3 years old and offers facilities for all other age groups. It is possible for children from other municipal schools in other villages or towns to use the facilities, but in this case a charge is made.

### *5. Finance*

A sum of 3 848 550 florins is paid by the Municipal Board each year.

### *6. Publications and documentation*

An information sheet is available in English and French.





### 7. Address

Mr. H. Wals, Director, School and Children's Garden Service, Raaltestraat 4, The Hague, Netherlands.

### Glasgow Parks Nature Conservation Section

*1. Glasgow Corporation Parks and Botanical Gardens Department, Nature Conservation Section*

#### *2. History, development and objectives*

The work was established by the Glasgow Corporation Parks Department. The aim is educational and social, with the emphasis on the appreciation of the environment and inter-relationships between man and nature. Emphasis is given to the discovery element, for example much of the trail leaflet texts consists of questions which can be answered by careful observation or by study of the texts.

The facility has the following components:

*a.* thirty-six school gardens originally laid out by the Parks Department and maintained by schools in term time. In the vacation time they are maintained by the Parks Department; *b.* ten parks provide nature trail facilities with guide books and guide sheets; *c.* five parks provide botanical facilities including four with conservatories and glasshouses for indoor studies; *d.* nineteen new school nature areas have been landscaped by the Parks Department with uncut grass areas, woodland and shrub planting and wild flower seeds provided by the Parks Department; *e.* three walkways are maintained by the Parks Department and have been adopted by schools for project work, and three ponds are used for eco-system studies in the parks; *f.* there are two zoological gardens and three wooded parkland areas used by school projects for the study of bird and animal life; *g.* three visitor centre or trail-side museum facilities are attached to parks.

### 3. Habitats

Largely urban park lands some of which are in the heart of the industrial and congested housing areas.

#### *4. Organisation, administration and description*

Environmental education facilities were set up by a Conservation Officer in conjunction with senior biology teachers. (See chart for details of organisation and tasks.) Administration is the responsibility of the Parks Department; teaching of the Education Department; and maintenance of the local parks staff. Each District Superintendent keeps records of visitor use on which research is based. Advance booking and pre-arranged visits by party leaders are essential.

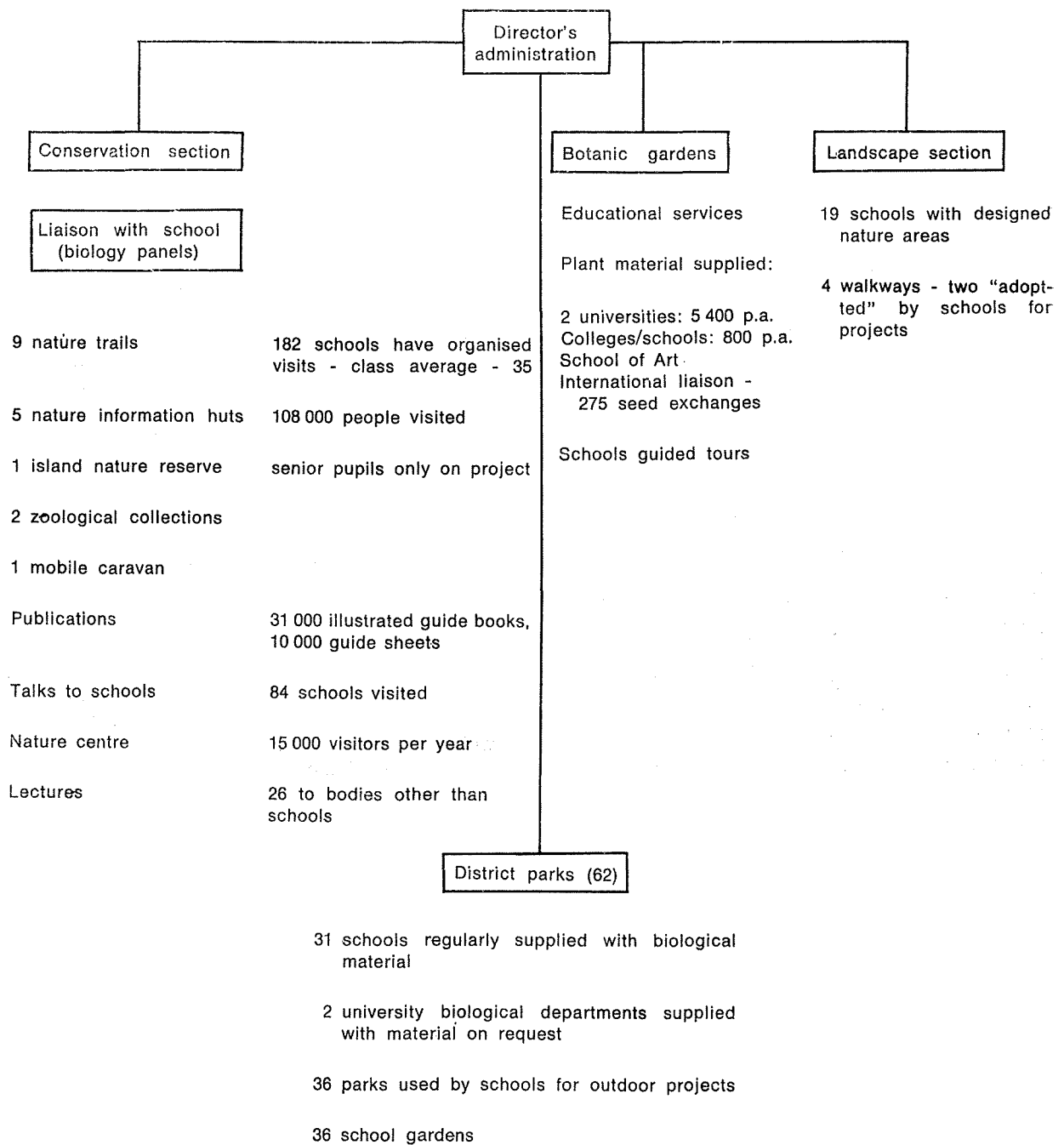
Thirty-six parks are used for environmental studies involving the work of 182 schools. Work includes the study of flora and fauna in a variety of ecological situations as well as plant culture both outdoor and under glass. The two zoos display native, domestic and wild animals. There are now nature trails in many of the Glasgow parks, including one in the Loch Lomond Park at Balloch and an island nature reserve in one of the city parks. The value of these trails to a city teacher is illustrated by the following extract from an article by two teachers in the Gorbals: "We found that the booklets on the nature trail provided by the Corporation provided an excellent basis for preparation and follow-up work as well as bringing to our attention points of interest during the course of the trail. Nature became alive for the children and the trail an introduction to the world beyond their doorstep. There emerged a new enthusiasm for discovery. On returning to school, books in the classroom and the library were eagerly searched for information. New observations were made in the home area."

The information huts serve as modest trail side museums at the start of five of these trails, but at Linn Park a mansion house has been adapted as a field museum and nature centre with the added facility of a lecture room with visual aid equipment.

Corporation of Glasgow

Director of Parks

Usage of parks for educational purposes



The setting up of linear walkways provides links between conservation, education and outdoor pursuits interests. They will follow disused railways, rivers, canals and woodlands, along routes to country parks on the city boundaries and on into the surrounding hills.

The Parks Department collaborate with the Education Department in planning the grounds of new school buildings. This creates a new aspect of recreation and environmental education available both within and outside school hours. This joint development has widened the range of opportunities for outdoor study work and includes small copses, uncut meadows, dark areas, wild flower seed sowing and, in favourable circumstances, children's gardens. Nineteen new primary schools are currently being planned in this way.

Teacher training colleges make increasing use of Glasgow Parks for project work.

Community education is an important concern in the city. The need to understand and appreciate the environment is shown by family groups, youth organisations and visitors alike.

There are future plans for additional nature

trails, ecological study areas within school grounds, rural walkways to and beyond the city boundaries and the restoration of industrial archaeological sites (e.g. Flint Mill, Snuff Mill, Pollok Water Mill).

No charges are made for the use of facilities, and transportation costs are borne by the Education Department. The provisions are used by all age groups and are open all the year round.

#### *5. Finance*

Construction and maintenance costs are embodied in respective park's annual estimates, and it is not possible to separate costs of environmental education.

#### *6. Publications and documentation*

Periodical reports and papers are available in English only.

#### *7. Address*

Director of Parks, City of Glasgow District Council,  
20 Trongate, Glasgow G1 5ES, Scotland, United Kingdom.

## 2. BOTANICAL GARDENS



*Botanical garden with so-called instruction squares.*

### **Definition**

*Botanical gardens:* collections of living plants arranged systematically which give opportunities to study the diversity of environments.

This type of facility is characterised by the fact that the plants are collections of living material and are arranged scientifically by systematic methods. Thus it excludes the specimens of plants in herbaria and freeze-dried plants in museums. There is nevertheless an important connection between botanical gardens, botanical museums and zoological museums. The history of the ideas which even today can be seen reflected in the objectives of many of these institutions is complex. A selection of some of the more salient points may help to explain some of the approaches which are followed today.

European gardens have their origin in Syrian, Egyptian and Greek attitudes to nature. The so-called "Latin" garden was partly a source of fruit and partly for recreation and amenity. In the Renaissance, the study of plants was concerned mainly with herbs and their medicinal use. Many

great botanical gardens owe their origin to scientific studies of this type. With the growth of early European colonialism, contacts with Central and South America brought new plants to our shores and the new concept of "plant gardens". In the years that followed, exploration and discovery included an element of scientific curiosity concerned with "new" plants and animals. Until the science of botany developed, much of this form of collection was concerned with the potential use or the curiosity value of the plants.

With the publication of Linnaeus's *Systema Naturae* in 1758, order was introduced into this "sublime chaos". It had direct effects on discovery, exploration and collection in the field and therefore on botanical gardens and museums, which were to take on the role of codifying and classifying collections. This redirection of a collector's enthusiasms into scientific classification resulted in plans which can still be glimpsed today. In the mid 18th century, Daubenton arranged the famous French collection or cabinet of curiosities in the Jardin du Roi on the basis of "methodical order which distributes things by

classes, genera and species". Since ecology was not developed until our present century we can hardly expect his arrangements to follow a habitat approach. This historical sketch underlines the importance of the fact that we are dealing with living collections which are systematically arranged.

In this century the tradition of the earlier centuries often prevails in that many botanical gardens are still primarily concerned with taxonomic research, and they do not always have a conservation function. This fact can be clearly discerned from their lack of accurate data about the provenance of much of the material in their collections. These collections were made in a general climate of optimism when the resources of the world were considered to be inexhaustible. Hence they do not raise questions central to environmental education and ecology even now, though Dr S. M. Walters has drawn attention to the need for a reappraisal of their role in both environmental education and in conservation. He sees the need for botanical gardens to study the autecology of rare plants, to answer questions of practical conservation and reserve management. He also stresses the need to safeguard stocks of threatened species, record information and reintroduce some plants.

### Variations

From the educational point of view botanical gardens with their systematic displays can demonstrate the importance of living plants and the problems of biological conservation. This is one of the major objectives demonstrated by the Edinburgh Botanic Gardens (2.5) with its new exhibition gallery. The latter overcomes some of the drawbacks of the systematic or taxonomic arrangement. It is able to use museum techniques in addition to demonstrations with living material, it is able to relate collections to other naturally occurring species and to concentrate on habitat studies in national nature reserves, and it is able to depart from the purely systematic approach with ecological displays. It is interesting to note that it has done this in close collaboration with the government agency responsible for wildlife conservation, the Nature Conservancy Council. Another interesting feature is the Interlink scheme with the Royal Zoological Society of Scotland's Education Service and with the Royal Scottish Museum, both in Edinburgh. There is considerable potential here for co-operative ventures and cross-fertilisation of ideas which could be tried elsewhere.

The Biological School Centre in Hanover (2.4) also shows a considerable range of facilities and a most varied work programme which sets it apart from others of the type. It has developed a hybrid form of facility which raises problems we shall discuss with regard to type 3. It is not surprising to find that, as a type, it is transitional between

the Hague School and Children's Garden Service (type 1. a) and landscape gardens (type 3). In terms of our concept of the concentric nature of environmental education we should expect to find a teacher training role, demonstration teaching, animal enclosures and an observation hide, and this indeed is the case.

In general terms, the five examples of this type show significant variations in their objectives — how far these are dominated by research or education; the type of administration which varies from statutory to federal agencies, local government, school administration or university; the size of their financial appropriation; the total numbers of visitors and the percentages of these engaged in full-time education; and the staffing and services offered.

### Problem issues

Despite the fact that there are very good reasons for following the traditional approach which places research in the forefront of objectives (and we are not for a moment suggesting that it should not be so), nevertheless botanical gardens are showing some signs of the development of a greater consciousness of their potential role in environmental education. Many of them were given new leases of life in the 19th century to meet the needs of popular education without their having to depart from the principles discussed earlier.

One of the very considerable problems common to all urban facilities considered by this survey is the importance of conservation, in the sense of conservation and natural habitats and wildlife populations, conservation of historic buildings, conservation of landscape types and conservation of collections indoors and out. The provision of special educational services is expensive and, if it takes precedence over other funds available for the primary objective of conservation of collections, one can see the dilemma of the facility provider clearly enough. But it is rarely as clear-cut an issue as this and it is encouraging to see from the examples given that so far it has not become an insuperable problem. The variations we have discussed show some of the practical ways of easing the difficulties which have been touched upon. Botanical gardens will require more finance and more staff if they are to realise this potential in the future, and logically they have a great deal to offer in environmental education and conservation.

Another issue that arises here is an omission rather than a problem. It can doubtless be explained in terms of shortage of finance and staff. There is a considerable disparity between the educational techniques used in the botanical gardens, techniques which range from labels on the one hand to full-scale interpretation on the other. These gardens have an inherent drawback in environmental education which derives from

the nature of their collections and the prevailing ideas of the time when those collections were begun. Links between indoor and outdoor facilities seem to be rare, for example ciné films showing specific habitats after a guided tour of the plants concerned. We are not suggesting however that all botanical gardens should develop type 3 facilities such as habitat gardens, as this would frequently prove impossible or impractical. Botanical gardens have one very considerable advantage over zoological gardens in that the problems of keeping plants "in captivity" are primarily matters of controlling the environment. Difficult and expensive though this can be, one cannot speak of "tame" or "wild" plant species in the same sense as with animal species. There is no equivalent therefore to the concept of a zoo sub-species in the plant world. In isolating the realism of the outside world, these gardens have therefore fewer problems than those met with in zoos. Educationally there are considerable possibilities for allowing tactile experience and for perception using all the senses, without at the same time harming the collections.

Another interesting comparison between botanical and zoological gardens, or between using plant material and animals in teaching, is the greater scope of services which supply the former rather than the latter. The time may come when it is wholly undesirable to allow teachers and pupils to collect plant and animal specimens themselves. They will have to be supplied with material specially propagated or bred for school use. Thus the problem of schools collecting plant specimens of their own may to some extent be alleviated by the staff of botanical gardens. One hopes that they will also advise teachers to develop identification keys for their own study areas and thus help to reduce the amount of plant material which actually has to be taken back to the classroom.

#### References

- Burbidge, Eudall, R. Watling, "A New Plant Exhibition Hall in Edinburgh", *Museums Journal*, Vol. 70, No. 4, 1971.
- B. Hofmann, *The Hanover Centre for School Biology as an Example for Teaching Methods in Botanical Gardens*, International Study Conference on Environmental Education in a Rural and Urban Setting, Netherlands, Council of Europe, 1975.

### Tårnby Kommunes Skolebiologiske Have

#### 1. Tårnby Kommunes Skolebiologiske Have (Tårnby Biological School Garden)

#### 2. History, development and objectives

The garden was created in 1968 by the Tårnby commune. The objective is to give teachers (especially in biology and orienteering) access to natural surroundings within a reasonable distance of their schools. It provides a place where they can together with their pupils supplement classwork and carry out biological, ecological

and other environmental field work which is usually followed up with appropriate practical exercises in a laboratory provided with the necessary equipment and documentation and located in the garden.

#### 3. Habitats

A typical suburb with villas and light industry.

#### 4. Organisation, administration and description

The curator of the garden is the Municipal Biology Consultant for Schools. The garden is open to teachers in the municipality, who can bring their pupils of all grades. Teaching material has been compiled for biology and orienteering classes so that teachers can prepare classwork and then examine the subject in greater detail actually in the garden with exercises of differing degrees of difficulty. The garden is administered by the educational authority of the municipality of Tårnby. Normal upkeep, in particular planting and improvement, is the responsibility of the Municipal Park Service. The facilities can be visited by some 100 pupils per hour. Pupils usually come for two hours at a time, often every week; the length of the period depends on the teacher. The garden is served by ordinary bus routes, and is only open to schools in the municipality. It is open every day until 4 p.m. in spring and summer, and can be visited by teachers and pupils outside school hours. The garden is open all the year round but the main season is from April to November.

A number of gardens are currently being laid out (in 1975) so that each class can have access to a garden for a period of one year at a time. The garden is to be cultivated jointly with species commonly grown in Danish farming and horticulture. The harvested crops are prepared jointly by all members of the class in connection with domestic science lessons when the class teacher in this subject takes over the class garden in the autumn season which starts in August.

In addition in spring 1976 a 12 m<sup>2</sup> large prefabricated glass-house was built. Here pupils cultivate vegetable seedlings until they can be replanted in the class gardens, and this glass-house also contains a small tree nursery. In 1975, at the end of the summer, pupils from the seventh form of the elementary school and the first form of the "Realafdeling" installed a 8 × 4 m large "eco-vivarium", with two prefabricated tanks and a three-stage waterfall, in which the circulating water is oxidised. In the vivarium the intention is to maintain a natural ecosystem with both catabolic chains (dead plants — earthworms — woodlice etc.) and anabolic chains (green algae — daphniae — fish — amphibians — reptiles).

As will be seen, the garden's new environmental facilities do not require much space, and they can suitably be attached to individual schools.

A permanent garden of medicinal plants, dyes and herbs is also being prepared.

## 5. Finance

The design and layout of the garden including digging the lake, planting, preparation of gardens reserved for particular classes, planning the buildings, laboratory facilities, classrooms, lavatories and storerooms, and the equipment and documentation cost some Dkr 250 000 (not including the price of land). This was financed by the municipality of Tårnby and mainly carried out by the Municipal Park Service.

## 6. Publications

Documentation is available in Danish.

## 7. Address

Skolen Konsulent S. Friis, AV-centralen, Fuglebaekvej 3, 2770 — Kastrup, Denmark.

## Montpellier Botanical Gardens

### 1. Montpellier Botanical Gardens

### 2. History, development and objectives

The gardens were founded in the 16th century by the University of Medicine and were restored in 1951. The objectives are educational for schoolchildren and adults. The main emphasis is on the study of the regional environment. In the face of growing environmental problems, the "gardens" organise guided walks for groups of schoolchildren and tourist and various educational societies, providing practical environmental teaching. These activities are being extended in 1975 to the Old People's University.

### 3. Habitats

The botanical gardens are in the town itself.

### 4. Organisation, administration and description

The Director traditionally holds the chair of medical natural history in the Faculty of Medicine; in addition there is a head gardener, eight gardeners and a secretary.

The list of activities includes a publication of a seed and plant catalogue which is sent to all correspondents every year and forms the basis of exchanges. Guided tours are conducted by a director or an assistant, on request, for groups of pupils, scouts, students, groups of adults, folk high schools, nature protection groups, and third year university students. In addition, mesoecological demonstrations are held every Sunday morning in the immediate surroundings of Montpellier to study the various biotopes in the region: dunes, wetlands, ponds, deteriorated Mediterranean plant communities, scrub, the Cevennes foothills. The number of participants is restricted to 20 and the service is provided free of charge. The botanical gardens are available all the year round but are closed on Saturdays and Sundays.

## 5. Finance

Chancellery of the university; the 1974 budget totalled F 82 500.

## 6. Publications and documentation

Documentation available in French. There is an ecological and botanical library.

## 7. Address

Professeur Hervé Harant, 5, rue Auguste-Boussonnet, 34000 Montpellier, France.

## Botanischer Garten Berlin-Dahlem

### 1. Botanischer Garten und Botanisches Museum Berlin-Dahlem (Botanical Garden and Botanical Museum, Berlin-Dahlem)

### 2. History, development and objectives

The botanical gardens were established in 1679 and the botanical museum founded in 1815, and in 1876 an exhibition was established. Since 1945 the facilities have been administered by the Berlin Senate. The primary objective is scientific, with the particular stress being on information and education activities.

### 3. Habitats

Urban.

### 4. Organisation, administration and description

The administration is divided into four departments (phanerogamic and cryptogam herbariums, botanical garden, and exhibition). The thirty-five staff include fifteen scientists. Research is conducted in the fields of systematic botany and plant geography and the allied fields of morphology, anatomy, and chemotaxonomy. There is a library of 40 000 volumes.

The total number of visitors to the botanical garden is between 300 000 and 320 000 including 70 000 school pupils; to the botanical museum 27 800 per annum. During the summer period, visits are organised on Sundays and led by scientists and senior staff in the botanic garden; in the winter season, visits are conducted by scientists in the botanical museum. These services are free of charge, and there are also visits to the facilities conducted by teachers. The entrance fee to the botanical garden is DM 1, and there is no charge for entrance to the botanical museum. Both facilities are easily reached by bus and subway. The facility is open all the year round.

Future plans include the appointment of a museum teacher in 1976.

The premises destroyed in 1943 are to be reconstructed for extensions to the library, scientific collections and exhibit area.

The facility comprises the greatest botanical garden in Germany.

## 5. Finance

DM 7 311 300 as part of the Berlin budget.

## 6. Publications

The following documents are available in German only:

Guide to the Botanical Garden,  
Guide to the Glass Houses,  
fourteen special guides on particular aspects of  
the botanical museum,  
two maps,  
a great number of postcards in colour and black  
and white.

### 7. Address

Direktion des Botanischen Gartens und Botani-  
schen Museums, Königin-Luise-Strasse 6-8, Berlin-  
Dahlem, 1 Berlin 33, Federal Republic of Germany.

## Biological School Centre, Hanover

1. *Biological School Centre, Hanover (Formerly  
Botanical School Gardens of Hanover-Herren-  
hausen)*

### 2. History, development and objectives

The gardens were founded in 1883 to supply  
schools with plants. Since 1961 this task has  
extended with the establishment of a biological  
school centre.

There are four major objectives closely connected  
with environmental education, as follows:

- a. to supply schools with biological material  
for demonstration and training purposes which  
they would otherwise obtain only with difficulty;
- b. to provide plants to be used in the gardens  
of the schools;
- c. to instruct pupils on selected subjects at  
the biological centre;
- d. to co-operate in the preparation of curri-  
cula and in the training and advanced training  
of teachers.

### 3. Habitats

Outskirts of the city of Hanover.

### 4. Organisation, administration and description

To fulfil the objectives the following facilities are  
available: the Botanical School Garden of Burg  
acting as a centre (approximately 75 000 m<sup>2</sup>), the  
Botanical School Garden of Linden (approximately  
15 000 m<sup>2</sup>), a hot house area of approximately  
1 000 m<sup>2</sup>, classrooms, the library, rooms for  
storing collections (approximately 700 m<sup>2</sup>), a class-  
room with aquaria, an aviary, huts for bird obser-  
vation, voleries, workshop and dining room. There  
is an outdoor garden in which plants are  
arranged according to plant systems, a landscape  
garden with forest communities, a heath, experi-  
mental grasslands with various cultivation  
methods, and water areas with footbridges.

#### a. Supply of plants for demonstrations

One hundred and thirty schools in Hanover are  
supplied at the beginning of the year with a cata-  
logue offering fifteen different items for the pri-  
mary and secondary schools, and every plant col-  
lection includes training aids with technical,

didactical and methodological explanations. The  
plants grown in the centre are delivered to the  
schools according to a schedule. Teachers also  
have the opportunity to order more plants  
individually. The schools of Hanover receive a  
25-page printed catalogue listing equipment,  
which can be borrowed from the centre, of a type  
which not all schools can afford (e.g. special  
aquaria, insect area, gauges, microscopes, pre-  
paration sets and instruments for ecological and  
hydro-biological fieldwork). In addition they can  
obtain animals to be used for behavioural tests  
(mice, fish, ants, leaf insects, guinea pigs, rabbits).  
Before equipment and animals can be borrowed,  
preparatory advice is given to teachers and  
written training aids are available on many  
subjects.

#### b. Plants for school gardens

Schools may order a variety of plant seeds,  
young plants, shrubs and bushes to grow in their  
own school gardens. The schools get detailed  
advice on how to use this material.

#### c. Instruction

In the course of a year, up to five classes per day  
receive lessons, and one or two other courses  
will be attending the centre. The most important  
subjects are: ecology (plant sociology, micro-  
climate measurement), behavioural science,  
breeding, ornithology, apiculture, productive plants  
from foreign countries, gardening, and flower  
arranging. There are also two-week courses of  
training and classes for mentally or physically  
handicapped children.

#### d. Curriculum planning and teacher training

This work includes the preparation of the written  
instructions for all the individual items supplied  
by the centre. The centre also assists in-service  
training by giving all teachers the opportunity to  
work at the centre as lecturers in special seminars  
and to act as advisers for the groups of younger  
or pre-service teachers who will work in primary  
and secondary schools or schools for the handi-  
capped. In addition the leaders of special  
seminars in Lower Saxony meet at the centre for  
a one-week teachers' conference every year.

The centre puts the greatest emphasis on  
instruction in biology for schools.

The staff include one head and three other  
teachers, one and a half posts in the secretariat,  
two garden masters (*Gartenmeister*), two gar-  
deners acting as part guides, twelve gardeners  
and skilled garden workers, two young assistants,  
three apprentices and one cleaner.

One hundred and thirty primary and second-  
ary schools are supplied with plants and 150 sec-  
ondary school classes receive instruction every  
year. Supply, instruction and bus transport is  
given free. Courses have to be booked in advance,  
for demand far exceeds capacity. Lessons are  
given almost exclusively by the teaching staff of



the centre and only schools of the city of Hanover may take part in this scheme.

Lessons are given between March and October, and the supply of material and loan of equipment is available throughout the year.

As far as is known, such variety of work programmes does not exist elsewhere in the Federal Republic of Germany.

#### 5. Finance

The City Schools Administration (not the Gardens Administration) is responsible for the centre. Wages and salaries are paid by the city authorities. There are separate funds available for the procurement and establishment of new material and facilities.

#### 6. Publications and documentation

Publications by the Biological School Centre of the Landeshauptstadt (capital of the *Land* of Lower Saxony) Hanover are available in duplicated form, in German only, and may be obtained free of charge.

#### 7. Address.

Biologieoberrat Gerhard Winkel, Hannover-Herrenhausen, Brockenweg 5A, Federal Republic of Germany.

### Royal Botanic Garden, Edinburgh

1. *Royal Botanic Garden, Edinburgh (also Younger Botanic Garden, Benmore, and Logan Botanic Garden, Wigtown)*

#### 2. History, development and objectives

The Royal Botanic Gardens originated as a physic garden for the growing and study of medicinal plants. Today, the garden and its associated gardens at Logan and Benmore, together with a library, herbarium and laboratories, fulfils the role of the primary centre for taxonomic research in Scotland. The living plant collections are arranged both out of doors and in controlled environment exhibition plant houses. Over the years the garden has also developed as a centre for better appreciation of plant life for the general public, including schoolchildren, and the collections are arranged to facilitate this. The gardens are now administered by the Department of Agriculture and Fisheries for Scotland.

An anonymous benefactor made possible the opening in 1970 of a plant exhibition hall specifically designed to demonstrate to everyone various aspects of the plant kingdom.

#### 3. Habitats

The Edinburgh Botanic Garden is situated in an urban environment.

#### 4. Organisation, administration and description

The organisation is set out on a separate chart.

The facilities include 70 acres of outdoor collections, 2 acres of demonstration garden, eight plant exhibition houses, one exhibition hall of 700 m<sup>2</sup>, a library of 60 000 volumes, a herbarium and two outstations.

The number of visitors in 1974 totalled approximately 600 000 and the gardens received approximately 30 to 40 school classes per month. The services are offered free of charge and there is an audio tour of the plant houses (cost 15p) of approximately one hour's duration. The facility is on city bus routes and booking is not necessary. There is a very limited amount of direct teaching by the education staff, usually only when specialised knowledge is required. There is direct collaboration with the education centre at the Edinburgh Zoological Society's Garden in projects to study the biology of particular environments.

The usual method of contact is for school teachers to be instructed by the Education Officer, either singly or in groups, and then encouraged to produce work sheets for their own classes.

The facility is open throughout the year and is closed on New Year's Day only. The only strictly similar institution is the Royal Botanic Gardens, Kew, Surrey. Future plans for development include two additional exhibition plant houses, a new alpine house, joint projects with Edinburgh Zoo and the Royal Scottish Museum, Edinburgh, a course for school teachers on the botanic garden and an audio tour for out of doors.

#### 5. Finance

No details.

#### 6. Publications and documentation

Burbidge, Eudall and Watling, "A New Plant Exhibition Hall in Edinburgh", *Museums Journal*, Vol. 70, No. 4, 1971.

Edinburgh Royal Botanic Garden Companion, Her Majesty's Stationery Office.

Younger Botanic Gardens Guide, Benmore, Her Majesty's Stationery Office.

Logan Botanic Garden Guide, Her Majesty's Stationery Office.

Monthly Notes April-September, Her Majesty's Stationery Office.

Guide to the Demonstration Garden, Her Majesty's Stationery Office (out of print).

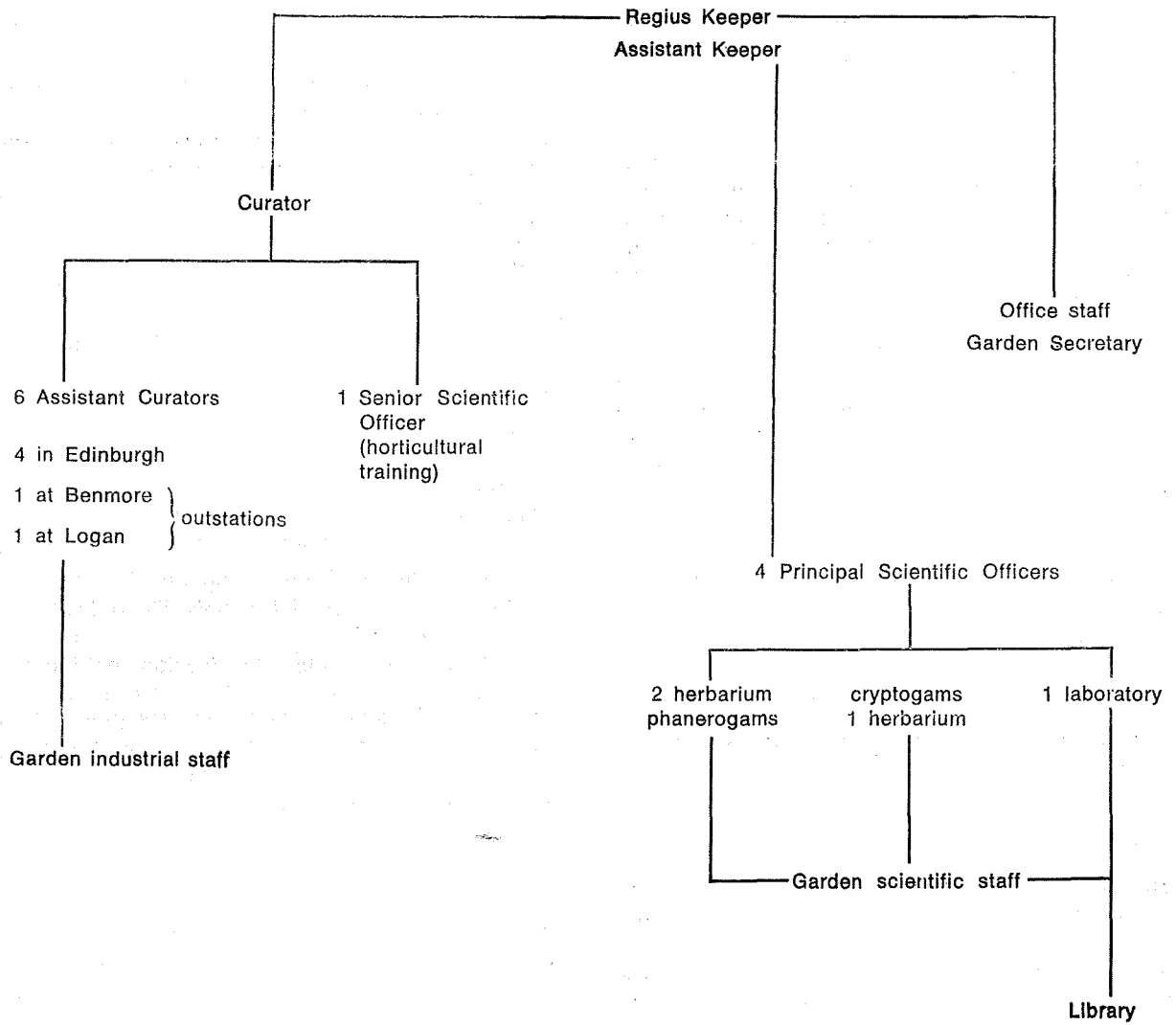
H. R. Fletcher, *The Royal Botanic Garden Edinburgh, 1670 to 1970*.

All available in English only.

#### 7. Address

D. M. Henderson, Regius Keeper, Royal Botanic Garden, Inverleith Row, Edinburgh, Scotland, United Kingdom.

Organisation chart



### 3. LANDSCAPE OR HABITAT GARDENS



*Example of an artificially created landscape garden in an urban area used for teaching purposes.*

#### **Definition**

*Habitat or landscape gardens:* collections of living plants arranged in rural habitat groupings which give opportunities to study the diversity of the living landscape and the interdependence of air, water, soil, plant and animal life, including man.

The characteristics of this type of facility are similar to those present in type 2, namely that here we have a collection of living plants, and they are usually in urban settings and man-made park landscapes. The type differs from botanical gardens in the objectives and the fact that habitat groupings are employed. Such groupings derive from the growth of the science of ecology in the 20th century, and for this reason they frequently also have animal collections in addition to plants. If they have a research element it is usually connected with environmental education for schools or teaching rather than taxonomic research.

In some European countries the term "landscape garden" is by no means always synonymous with the term "habitat garden". In the 17th and 18th centuries the romantic movement sought

to imitate nature and depart from the stylised and formal arrangements of gardens to produce a wild garden and to elevate gardening to an art. Indeed it is common to draw a distinction between gardening and landscape architecture, and in so doing we mark the birth of an art which attempts to mimic natural forms with vistas and groupings of plants. Some writers have called the culmination of this form the paradise garden. It is a so-called completely natural garden, a fanciful attempt to recreate the Garden of Eden. Such a feature should display a great variety of plants, seemingly growing wild and untended, with water features which contain natural springs and streams rather than artificial fountains. But these landscape gardens, many of which are very beautiful and justly famous, are not natural, nor are they habitat gardens. The arrangement of plants, frequently taken from several continents, and the emphasis of the collection, is everywhere on the exotic. The landscape architect is first and foremost an artist rather than an ecologist. It is as if he were painting a picture with plants. In some cases painting did influence the form of these gardens and in other cases landscape architecture influenced aesthetic taste and paint-

ing. If there is a wilderness element about the landscape garden it is most contrived and planned simply to give contrast to surprise vistas.

### Variations

The landscape garden of Frilandsmuseet, near Copenhagen, which houses the buildings of an open-air museum, poses a particular problem of definition. This facility is not described in the text because it is not primarily for environmental education or interpretation.

On a broad platform of boulder clay left by the retreating ice vast quantities of sand were imported in the last century to reconstruct a sand dune landscape on which marram and lyme grass were planted. In this "coastal" landscape situated in the suburbs of Copenhagen the visitor can now see fishermen's bothies which typify the west coast of Denmark in the 19th century. Passing through a barrier of tall pine trees the visitor comes upon another landscape type only a few metres away — the marshland with its drainage ditches and reeds and beyond this the reclaimed land with a large farmhouse. So through more than a dozen landscape types and their related farming systems one obtains the illusion of walking through the Danish landscape of the 19th century. Every effort is made to perfect this with evidence of the way of life in each distinctive type of landscape. But the purpose of the open-air museum is claimed to be research into comparative ethnology. The open-air museum is not restricted to visiting ethnologists, however, and this makes the distinction a somewhat academic one. It is perhaps a reflection on the fact that ethnology is not generally taught in our schools. It must surely be indisputable that the facility has even more potential for environmental education for schools and environmental interpretation for the visiting public than many habitat gardens. The example in the survey of type 3 is Bensheim Biotope which, whilst more modest in extent than Frilandsmuseet, has classroom facilities, and is designed for the study of ecological problems. In commenting briefly on the Hanover Botanical Garden we noticed that there was also the development of a habitat garden. This includes animal life and hides for observation together with forest, heath and grassland habitats.

### Problem issues

Whilst we have seen that the habitat grouping of plants gives greater opportunities for a study of ecology than the systematic grouping of the traditional botanical garden, they are still artificial collections which attempt to simulate reality. If there is a rural equivalent to this urban parkland type it is the educational reserve in an enclosed area of natural countryside. This concept raises the whole question of what we mean by "natural", whether we can speak of our countryside as being natural and not man-influenced, whether we can

form a habitat garden in a rural area by enclosing it, whether the real enclosure isn't more properly regarded as the limit of effective management of the reserve and whether the type 3 landscape garden is really much more artificial than the so-called natural area on the one hand or the so-called paradise garden on the other. The answer to these questions should be apparent from the lessons learned from solving the management problems. We are opening up not only a series of practical problems here, such as the difficulties which Frilandsmuseet faced when attempting to establish heathland on imported sand overlying boulder clay, but also a very considerable series of deeper philosophical and pedagogical problems such as what do we mean by wild and natural?

The arrangements of plants into habitat groupings is also done on a relatively small but highly effective scale by the Hague School Garden Service. There comes a point at which the scale of the operation is so small that the facility can only simulate reality in a kind of skeletal form, for "habitat" implies that the plant grouping must be the habitat of some form of animal life. If the biotope reconstructed artificially contains insects and birds but lacks the population of small mammals, simply because their introduction would raise too many management problems, then it is bound to be only a partial simulation of reality. This does not necessarily mean that the facility lacks authenticity however. It means that the educationist must take care how he uses such facilities and what impressions he leaves the students with at the end of their studies. It is perfectly legitimate to use such areas to study aspects of ecology providing that the teacher is aware of their limitations.

### Reference

M. Walters, "The Role of Botanic Gardens in Conservation", *Journal of the Royal Horticultural Society*, 98, 1973.

### Bensheim Biotope

1. *Biotope of the Altes Kurtürstliches Gymnasium, Bensheim*

2. *History, development and objectives*

The facility was opened in March 1973 by the Department of Biology. The object is educational: to give insight into ecological problems.

3. *Habitats*

Park landscape. The major simulated habitats introduced are heath, pond, alpine garden.

4. *Organisation, administration and description*

The biotope is an area of approximately 600 m<sup>2</sup>; it serves the purpose of demonstrating to the pupils various typical landscapes with their characteristic vegetation. These include a. an area of typical heath plants, b. a small artificial lake

of about 25 m<sup>2</sup> containing aquatic plants and fauna, c. an alpine garden, d. a plantation of xerophytic plants which is still under construction, e. a hot-house of 12 m<sup>2</sup> which is being erected for the study of tropical plants (a job that will keep both pupils and teachers occupied in the holidays). In order to avoid any bias in favour of botany, three aviaries have been built in the complex to house local woodland birds, parakeets and parrots. In addition there are now plans for students' plots designed for experiments on plants, crossbreeding and hybridisation.

In the adjacent school building a basement is to be furnished to enable students to carry out physiological studies. To date, one corner of the biotope has been equipped to enable the teachers to transfer normal indoor teaching to the biotope itself. A start has been made on this project and it is already used by students, but it awaits more financial support for completion.

The facilities are used by classes and teachers who are members of the school, and the

teaching is done exclusively by this organisation. The age of groups ranges from 10 to 19 years.

Plans for the future include the making of an environmental education trail.

No other facility of this type is known in the Federal Republic of Germany.

#### *5. Finance*

The funds raised by parents totalled DM 15 000, funds raised by schools' own initiative and work DM 35 000, and funds raised from government grants DM 8 000, totalling DM 58 000.

#### *6. Publications and documentation*

Year book of the AKG Bensheim available in German.


#### *7. Address*

Bodemann/Maier, Wilhelmstrasse 64, D-614 Bensheim/Bergstr., Federal Republic of Germany.

## 4. ZOOLOGICAL GARDENS

**ZOO**  
SKOLETJENESTEN

### Savannen



**Eks. på opgave**

Hvad spiser giraffen i Zoo ? .....

Hvor højt hænger kurvene i girafhuset  
(se målestok på væggen) .....

Hvorfor er kurvene anbragt som de er ?  
.....

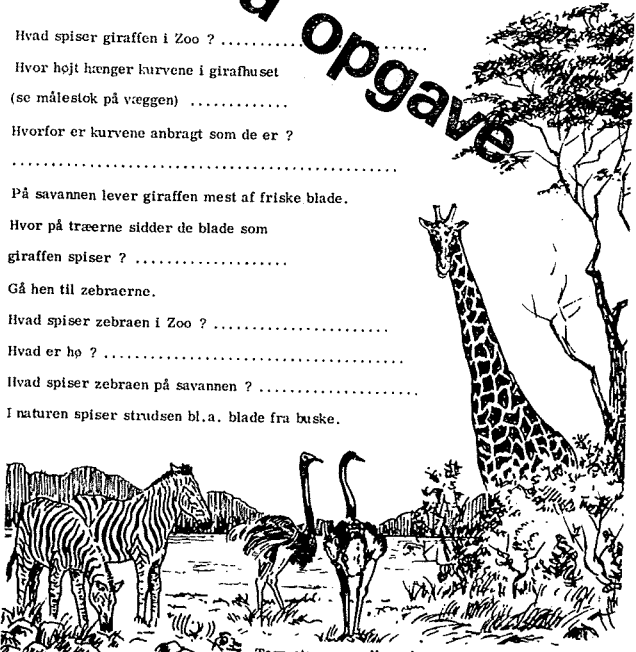
På savannen lever giraffen mest af friske blade.  
Hvor på træerne sidder de blade som  
giraffen spiser ? .....

Gå hen til zebraerne.  
Hvad spiser zebraen i Zoo ? .....

Hvad er hø ? .....

Hvad spiser zebraen på savannen ? .....

I naturen spiser strudsene bl.a. blade fra buske.



Tegn streger mellem dyrene og deres føde.

Vend.

*Zoo-Skoletjenesten. Example of a booklet for pupils: the tasks set out stimulate the pupils to learn by self-discovery.*

### Definition

*Zoological gardens:* collections of living animals arranged systematically which give opportunities to study the nature and variety of animals, their biology and behaviour, and which help to stimulate an awareness of the relationships between man and animals and their environment.

This type of facility is characterised by the fact that the animals are living (as opposed to skins or stuffed museum specimens), are arranged in systematic order on a taxonomic basis or on the basis of their world geographical distribution (as opposed to habitat groupings and collections of endemic or indigenous species), and are displayed in cages (as opposed to large natural or semi-natural enclosures). These points will be taken up in the next section on wildlife

parks but at this point in the discussion we shall concentrate on the implications of the definition in relation to zoos, museums and botanical gardens. There are some important parallels which can be made from a comparison of the ideas which these facilities share.

A brief historical sketch may once again help to identify the central issues. The zoos have their origin in the Roman circus, the mediaeval fair and the menagerie, which are perhaps the first travelling exhibitions or circulating collections. The emphasis was not on what we would now regard as education, though there were elements which were undoubtedly educational and even modern! The attraction was to be found in the entertainment value and in the kind of pleasure which people find in spectacle. The wild, and particularly the fierce, animal was regarded as an

object or spectacle. This is the form of uniqueness which is seen in terms of curiosities and freaks. Scientific curiosity, on the other hand, is quite another thing, though there were times in our history when this may not have been so obvious. The scientist was first motivated in the 17th century, as we have seen in the development of botany, by medical research. The zoological counterpart was medical interest in anatomy, and with the impact of Linnaeus this field of scientific endeavour found some of its principles in the classification of the anatomical structures. Scientific curiosity was therefore able to focus attention on what we would regard as serious issues rather than on spectacle or entertainment. But, as so often happens, this movement did not merely replace one set of ideas with another. We can still find the "mediaeval" motives present in the viewing public today, side by side with an interest in scientific education. Display, for example, is not entirely a matter of scientific education, for it contains an element of that type of enjoyment which seeks an entertainment value and many modern educationists regard this as a vital part of motivating children.

Just as romanticism influenced thinking about gardens and museums in 18th century Europe, so it also had profound effects on man's attitudes to animal life and hence on zoological collections. When much of Europe was "in chains", the romantic idea of freedom led many people to regard the wild animal as noble and dignified, and to see the caged animal as a symbol of a state in which many of them found themselves. It was not until Carl Hagenbeck evolved the wildlife park at Stellingen that these ideas seemed to achieve a practical expression — the wildlife park without bars or cages. It would be quite erroneous, however, to think of Hagenbeck's work as romantic, for he was less interested in the ideas of Rousseau than in the growth of the new science of ecology in this century. But, as we shall see, romanticism is never far away when we make comparisons between the idea of zoos and the idea of wildlife parks.

The amenity and recreation element which is found in the development of important gardens in Europe also seems to have equivalents in the zoo. The conservation and education roles are far from absent from our zoos, and much more seems to be done in these fields than is the case with botanical gardens at present. For example in 1959 there were 56 Przewalski wild horses in zoos and only 20 in the wild; six years later there were 150 specimens in zoos and none in the wild. Organisations concerned with the fate of rare breeds and conscious of the fact that the loss of gene reservoirs would be a major blow to scientific conservation have developed a particular interest in zoos which has nothing to do with entertainment or recreation. In our century we have woken up to the fact that the biological resources of the world are not inexhaustible, even

though they are theoretically more renewable than such finite resources as minerals. It is only very recently that we have learned that wildlife preservation is a theoretical concept and that conservation of stocks requires the management of habitats. As with plant collecting where we saw the great colonial explorers go forth in the spirit of optimism and confidence, so with animal collectors the live trophies were brought back for public gaze and were regarded merely as expendable objects.

### Variations

It will be seen from the chart of facilities that the five examples of zoological gardens which have been chosen demonstrate considerable variations. Frankfurt (4.3) and Natura Artis Magistra in Amsterdam (4.4) might be regarded as the archetypes, and they have developed most interesting education and interpretation services. The techniques they describe have considerable bearing on the objectives of environmental education and illustrate the great potential which zoos have in this field. The list of topics given in 4.3 makes this abundantly clear, as does the most interesting remark in 4.4 that "the teaching of zoology, *sensuo stricto* was deliberately left to schools and the zoo demonstrations concentrated on ways of improving insight into environmental problems".

What the Hague School and Garden Service is to type 1, so the facilities at Copenhagen (4.2) and Edinburgh (4.4) are to type 4. We have here an interesting and enterprising new system of links developed on a co-operative basis between related facilities. Thus in 4.2 we see a spectrum of developments through school biology services, the zoo, urban and rural museums and residential field study centres. In 4.5 we have a project called Interlink between a zoo, museum and botanical garden for the city of Edinburgh, designed to improve environmental education teaching.

The Antwerp variation on these themes is one which introduces a degree of participation into the education, a variation of particular interest. Voluntary participation by conservation work on nature reserves is a form of follow-up directly linked with the activities of the zoo in this case.

### Problem issues

From the above discussion it will not come as a surprise to learn that one of the problems raised by the use of zoos in environmental education is the more commercial aspects of the provisions. The danger that amusement will dominate educational enjoyment and scientific discovery is ever present. One reason why this relict from our past history is still with us is because not all zoos have given as much thought to their educational objectives as they might have done. The basic minimum here is the descriptive label on the cage.

When the objectives are primarily concerned with environmental education one might expect the question of arrangement and design to be related more directly to objectives than often appears to be the case.

Zoos can introduce into environmental education a conservation element by drawing attention to endangered species and by explaining why animals are sometimes threatened with extinction. This can be related to man's activities, to populations, and to resources in general. It is possible to use zoo collections to show how destruction of habitats has led to further extinction, how the majority of species which have become extinct in the last 400 years have done so because of human interference and man's destruction of the animal habitats. The public who visit zoos or watch animal programmes on television are frequently unaware that the curious objects of their interest are in fact interesting because they have achieved the status of rarity at the hand of man. Such an approach can also make it plain that wildlife conservation is international; it is no use conserving animals which migrate through other countries if the country where they breed doesn't also practice conservation of the habitats the animals require. By the same token, it is little use to conserve species which are extinct in the wild in our zoos in the hope of reintroducing them, if there are no areas large enough for this purpose or sufficiently well protected to make the policy workable.

A problem peculiar to the use of live animals in teaching is the temptation to introduce anthropomorphism. It is commonly met with in guided tours and films and even more commonly in children's zoos and pets' corners. The pedagogical principle at stake here is that children should learn about the reality of the world. If a visit to a zoo gives them the impression that all animals are a sort of cuddly toy, this could be a considerable drawback when the child reaches the higher levels of teaching. It is easy enough to play on sentiment with very young children but there is a considerable difference between developing a respect for living things and developing inaccurate ideas about how creatures depend on one another. It is a special case of the curiosity syndrome, which has to do with freaks and oddities. Developing a sense of responsibility may be more easily achieved by encouraging children to keep their own pets properly in schools, rather than taking children to pets' corners in zoos simply to stroke the sheep and goats.

The environmental education work of the zoo can materially be assisted by the employment of media such as ciné films. For certain types of behavioural study there is no substitute for first-hand observation of the reality, but to see animals from overseas in their natural habitats can be effected in the zoo if film shows are employed. Care must nevertheless be taken to relate the

films to the observation of the animals in cages. There is great potential in this combination for teaching conservation topics. The zoo is possibly one of the best facilities of all to develop the concept central to conservation — that the variety of wildlife in the world is important and that the variety is in danger. The scientific reasons for this importance can be explained in zoos — the importance for the scientific record, for gene reservoirs, for aesthetic reasons, and not least for educational reasons.

#### References

- D. G. Lambert Hall, "Zoos and Education", *Trends in Education*, No. 27, June 1972.
- R. Chaplin, "Educational Services in Edinburgh Zoo", *International Zoo Year Book*, Vol. 15, 1975.
- R. Chaplin, *The Educational Use of Zoos*, World Zoological Society and Institute of Biology, Scottish Branch, Conference 1975.

#### Royal Zoological Society, Antwerp

##### 1. Royal Zoological Society of Antwerp Educational Service

##### 2. History, development and objectives

Following the reorganisation of the Antwerp Zoo, the Educational Service was established in 1949. The objective is educational.

##### 3. Habitats

Urban.

##### 4. Organisation, administration and description

The service includes the organisation of guided tours for pupils, including a lesson in one of three permanent classrooms, special programmes for blind and handicapped persons, and programmes for youth organisations and adults. Nature protection work camps are organised annually in the nature reserve of the Zoological Society "De Zegge" at Geel. Lectures and film evenings are held throughout the country and photographic material is made available to exhibitions.

The facility is open all the year round. In 1974-75, 75 000 pupils attended the zoo class programmes. Teaching staff includes outside volunteers.

##### 5. Finance

Financed by the private Royal Zoological Society of Antwerp (natural history museum, zoological and botanical gardens, public library, aquarium, research laboratories, dolphinarium etc.).

##### 6. Publications and documentation

Zoo magazine.

##### 7. Address

The Director, Royal Zoological Society of Antwerp, Konigin Astridplein 26, B - 2000 Antwerp, Belgium.



## Zoo-Skoletjenesten, Copenhagen

### 1. Zoo-Skoletjenesten (Copenhagen Zoo School Service)

#### 2. History, development and objectives

The service was established in 1972 by the Copenhagen Zoological Garden and Copenhagen Educational System. The objectives are educational.

#### 3. Habitats

Urban.

#### 4. Organisation, administration and description

The staff complement consists of the Head of Education Department (40 hours per week), three students (each 15 hours per week) and three conscientious objectors (each 40 hours per week). The general administration is the responsibility of the Head of Education Department, the students and the conscientious objectors. The financial and pedagogic responsibility lies with the Head of Education Department.

The educational materials, including worksheets, are produced by the Head of Education Department and the students. The distribution or delivery of worksheets to the pupils and feedback of completed work is done by the students and the conscientious objectors. The facilities include 40 to 50 different worksheets, information papers, teaching games, teacher guides and maps.

Each year 170 000 pupils make use of the service ranging from nursery classes to twelfth grade pupils. The services are offered free of charge and are available all the year round. Advance booking is essential.

The Zoo School Service is associated with the Copenhagen school service and the educational department of the zoological museum, the aquarium and the different anthropological museums (the National Museum, the Viking Ship Museum in Roskilde and the experimental archaeological centre in Lejre known as Forsøgscentret.) The Zoo School Service opened a modern classroom on 1 August 1976.

There are other zoological gardens in Denmark, but only the Copenhagen Zoo has a school service of this type.

#### 5. Finance

The Zoo School Service is financed by the Copenhagen Zoological Garden and counties in and around Copenhagen. In 1975 salaries amounted to a total of Dkr 150 000.

#### 6. Publication and documentation

An article in *New Era* and various articles in Danish are available.

#### 7. Address

Lars Lunding Andersen, Zoo-skoletjenesten, Zoologisk Have, Sdr. Fasanvej 79, 2000 Copenhagen F, Denmark.

## Zoological Garden, Frankfurt

### 1. Zoological Garden of the City of Frankfurt Schools Department

#### 2. History, development and objectives

The Schools Department was founded in 1960 as the first facility of its kind in a German zoo. The objective is to make use of the zoo animals for teaching purposes and especially to support the biology teaching of the schools. The main emphasis is on the subjects of ethnology, ecology and nature conservation. Live animals are used for object teaching.

#### 3. Habitats

Urban.

#### 4. Organisation, administration and description

The main work of the department is a. the provision of instruction in biology for visiting school pupils, b. the organising of special courses, seminars and teachers' conferences to familiarise them with the potential of the zoological garden for biology teaching, and c. the presentation of the zoo as an excursion target and educational establishment of importance.

Zoo instruction tour programmes are published in the bi-annual *Information from the Frankfurt Zoo* which is sent out to 7 000 schools. In addition to the object-teaching alongside the cages there is also the possibility of working in a small classroom at the zoo equipped with projectors (both for slides and films), display boards and wall maps of animal geography.

Most of the twenty-one instructional tours which have been worked out up to 1974 deal with nature conservation and environmental protection topics; this is especially so of the zoo instruction tours established in 1970 under the subject headings "Nature conservation — a major task of modern zoological gardens", "Why animals are threatened by extinction" and "Endangered animals in Asia".

The School Department is part of the zoological garden run by the city of Frankfurt, and its staff include one full-time Education Officer (curator for education and instruction), and several voluntary educational assistants who are specially trained teacher graduates. The work is also assisted by other staff of the zoo.

Guided tours of instruction on school biology and other specific topics related to this are given to primary, secondary and comprehensive school pupils. Tours of instruction on teaching methods for college of education students and teachers are also given. There are also courses and excursions for biology students held in the zoo.

The facilities are open all the year round. In 1972 the zoo was visited by 1 196 school classes from Frankfurt and 6 328 school classes from elsewhere. One hundred and sixty-nine school

classes participated in the instruction tours and demonstrations guided by the Education Officer and her staff. In 1973 there were 135 school classes with 4 725 pupils. In total, 569 classes with 22 085 pupils were instructed in the zoo in 1973. In that year the school department organised for the first time a special programme in co-operation with the Federal Railway. Twenty-two special trains were made available on as many days from May to July 1973 to transport over 17 000 pupils with their teachers to visit the zoo and to be lectured here on "Rare animals in the Frankfurt Zoo - Modern ideas on the care and keeping of wild animals".

Visits must be booked at least a fortnight in advance. In addition to guided tours arranged by the school department of the zoo, teachers may also make use of the zoo's classroom for instruction purposes.

There are some ten educational facilities of this kind or of a similar nature in zoological gardens in the Federal Republic of Germany. The objectives of the others are similar, the working methods slightly different. The heads of the school department and zoo schools are members of the International Association of Zoo Education Officers.

#### 5. Finance

The school department has no budget of its own, the financial needs are met from the general budget of the zoo.

#### 6. Publications and documentation

*Jahresberichte des Zoologischen Gartens der Stadt Frankfurt am Main* (Reports of the zoological gardens of Frankfurt) and *Mitteilungen aus dem Frankfurter Zoo*. These publications are available in German only (but the annual reports have quite large English summaries, including the educational activities).

#### 7. Address

Priv. Dozentin Dr Rosl Kirchshofer, Zoologischer Garten, 6 Frankfurt am Main 1, Alfred-Brehm-Platz 16, Federal Republic of Germany.

### Royal Zoological Society, Amsterdam

1. *Royal Zoological Society, Natura Artis Magistra, Education Department, Amsterdam*

#### 2. History, development and objectives

The society was founded in 1838 as a private organisation and the city and University of Amsterdam are represented on the board. Its educational aim is to promote and retain interest in the living animal by maintenance of a collection of reasonable diversity. It also aims to disseminate information and promote zoological research. In this context informing the public has been an important task for the zoo staff since its inception. Originally this information only reached members

of the society, but early this century the public increasingly became involved in the educational work of the zoo. The work consists mainly of providing publications, guided tours, labels, information charts, zoo guidebooks and radio talks on zoo animals which have become extremely popular. As a result of these developments a zoo inspector, the late Dr A.F.J. Portielje, was able to specialise in education work and was appointed head of the Information Service.

In the 1950s it became clear that this work was reaching only the interested public, for the number of visitors increased much more rapidly than requests for help and information. It was decided therefore to adopt a more active educational and information policy and guidance was no longer given only when requested. Economic restrictions made it essential to limit this service to schools in the main. The results have been striking, both in quantity and quality.

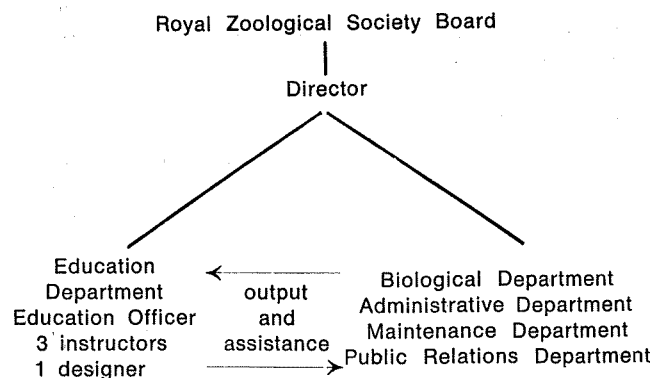
The teaching of zoology *sensuo stricto* was deliberately left to the schools and the zoo demonstrations concentrated on ways of improving insight into environmental problems. In recent years even more stress has been put on the need to link first-hand experiences gained in the zoo with the reality of the world in which the student lives. This is extremely important particularly for young children. Today more and more emphasis is being given therefore to environmental education and interpretive facilities for the general public.

An increase in the teaching staff to cope with an ever-increasing demand for zoo lessons is planned. Co-operation with others working in the field of environmental education, in education centres for adults in addition to schoolchildren, is also envisaged in the future.

#### 3. Habitats

Urban area — the work is mainly done on the zoo grounds with the zoo animals and domestic pets.

#### 4. Organisation, administration and description



The zoo receives 1 200 000 visitors per year. It produces 32 000 copies of its bi-monthly magazine each year and 250 000 people (mainly schoolchildren) attend film shows during the year.

Zoo lessons are given in three instruction rooms. Each year 40 000 pre-primary, primary and secondary school pupils receive instruction and 1 000 high school, training college and university students. Thirty thousand persons attend the guided tours and excursions each year. Most classes visit the zoo for lessons once a year. The services of the Education Department are offered free of charge, and the students pay a reduced entrance fee to the zoo. No transportation facilities are available. Advance booking is essential; schools from Amsterdam book at the beginning of the school season after receiving the programme from the Amsterdam Natural History Council (ANR). There are no outside teaching staff but school teachers who want to conduct their own students can be given materials for a zoo lesson. Services of the Education Department are available for groups of any age visiting the zoo although, for practical purposes, schools are given priority.

A typical zoo lesson consists of a short introduction in the classroom followed by a visit to the animals that have been selected for study. The students are then given worksheets to engage active participation and to challenge them in observing animal behaviour. For young children close contact with the animals is an important teaching requirement.

#### 5. Finance

Approximately 200 000 florins is paid from the total budget of the society; about 50% of that budget comes from the city of Amsterdam and the province of North Holland.

#### 6. Publications and documentation

Rensenbrink and Jacobi, "A Few Remarks on the Educational Work in Zoological Gardens", *Int. Zoo Yearbook*, 6, 231-4, 1966.

Rensenbrink, "The Zoo is Not a School", Conference "Learning from Life", Paignton, 1968 (not in print).

Rensenbrink, "The Need for Automation", Conference on Education in Zoos, Amsterdam, 1969: summary account.

Rensenbrink, "Nature Conservation and Nature Education in the Zoo", Conference on Education in Zoos, Frankfurt, 1972: *Proceedings*.

Rensenbrink, "Van Mijneer Portielje tot educatieve dienst", zoo magazine *Artis*, 1974, IXX, 6, p. 192 (in Dutch only).

Lensink and Rensenbrink, *Nota over het educatieve werk*, Amsterdam, 1975 (in Dutch only).

#### 7. Address

H. P. Rensenbrink, Education Officer, Plantage Kerklaan 38-40, Amsterdam, Netherlands.

### ZooEd, Edinburgh

#### 1. Royal Zoological Society of Scotland Education Service - ZooEd, Edinburgh

#### 2. History, development and objectives

The society was founded in 1909 and the education service was set up by the RZS of Scotland in 1971. Successive royal charters have confirmed a national role of the society in matters relating to wildlife and the environment and have emphasised the importance of both formal and informal education in fulfilling this role. The Education Unit was specifically created to formalise and expand the education work of the society. The objective of the unit is to "create through education, an awareness in the community of wildlife and environmental matters". Community refers to the population of Scotland, visitors to Scotland and to the zoo. Inevitably the greatest in-depth use of the service is by educational groups, particularly schools.

The society believes that the provision of wildlife and environmental education services must:

a. Be available to all sections of the community;

b. Be presented in an attractive and unobtrusive manner;

c. Be provided in collaboration with other interested bodies (e.g. the Interlink scheme);

d. Begin in the urban environment where the majority of the population live and prepare people and children for a countryside experience;

e. Provide many opportunities in the urban environment for biological education, environmental study and the study of the comparative biology of urban and rural areas;

f. Provide through the work of its zoological garden a unique opportunity to broaden the biological experience of visitors and perform the role of a valuable teaching aid in developing concepts of care and concern for wildlife beyond the local experience. ZooEd relates these two experiences;

g. Be supported by visitor information services which relate to the abilities of the users. This implies that there is a hierarchical structure to the information provided both in terms of accessibility and comprehension;

h. Be based on the premise that conservation is not a curriculum subject but should arise out of observation and discussion of the environment and features therein.

It is planned that as the service develops the unit will become increasingly concerned with the provision of wildlife education facilities and services outside the zoo. Work has begun on the building of an education centre as a three phase operation and plans are being formulated to secure sufficient funds in the future to finance this unit. In the first three months of 1975 the unit

taught three quarters of the previous year's total and it aims to extend these services to make them available to non-school organisations including youth and community work. It is also hoped to develop the programme known as Interlink.

### 3. Habitat

The suburbs of the capital city of Edinburgh. The zoological garden has adjoining urban housing

and a large area of wild parkland within the green belt.

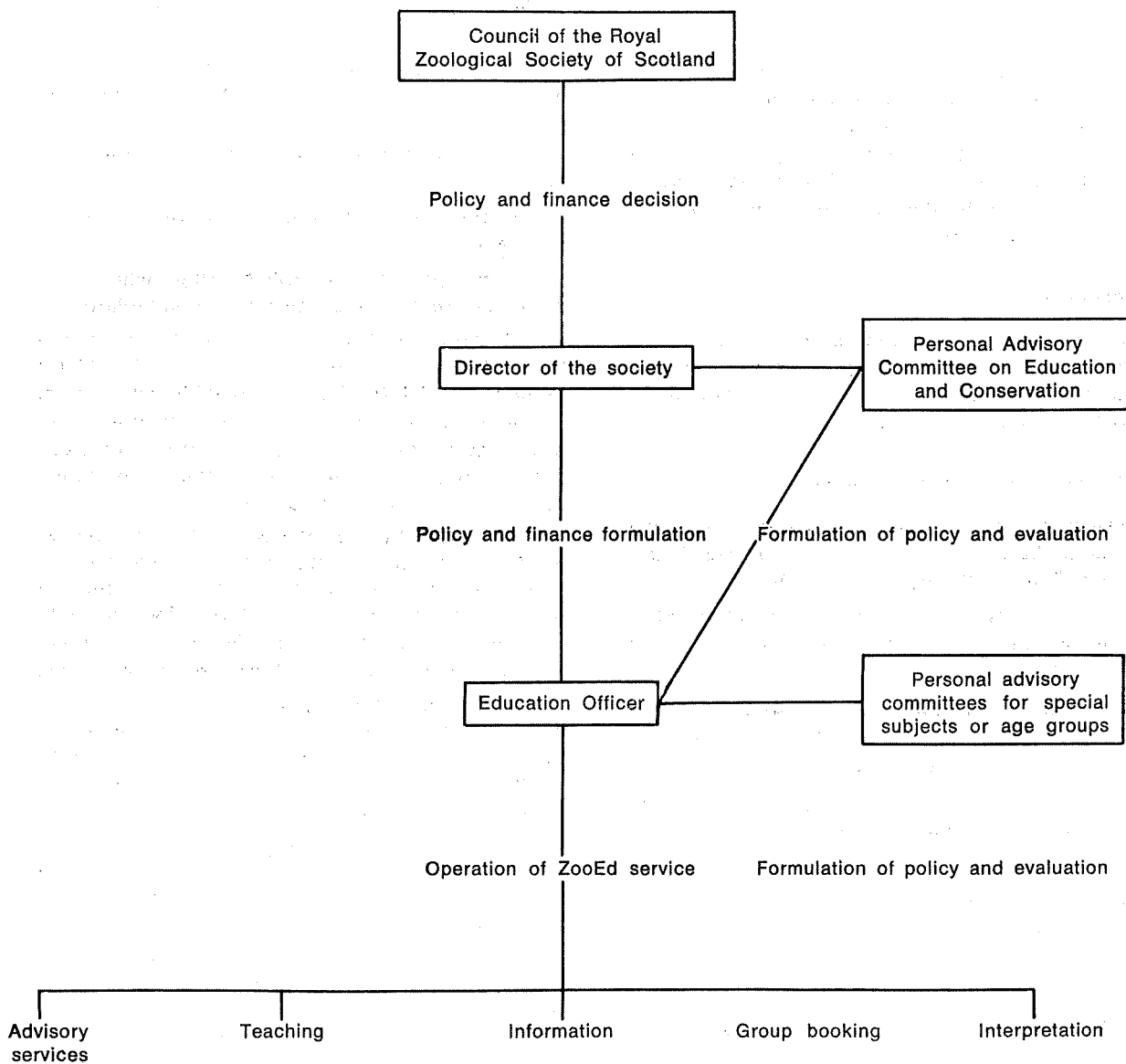
### 4. Organisation, administration and description

See chart of administration.

The ZooEd programme provides:

- a. a direct teaching programme in wildlife, biological and environmental subjects,

Organisation chart



b. project sheets and information leaflets for the teaching programme,

c. tape-slide programme hire service,

d. advice and guidance on the use of zoo services,

e. advice and guidance on the availability of environmental education resources,

f. information services and bookshop,

g. organisation and promotion of group visits to the zoo,

h. park interpretation and notice board service for the zoological park,

i. meetings for the society's adult members (over 4 000) and for junior members of the society (1 200) on a regular basis.

The zoo is visited by over 700 000 people annually. In two years the use of the zoo by educational groups has increased from 76 000 in 1972 to 102 000 in 1974. Of these approximately 25% make use of the educational services. The unit operates throughout the year.

The society offers a basic programme of activities which are set out in a booklet published annually, *ZooEd Services*. Special projects are also arranged and these are advertised.

The society initiated a programme concept called "Interlink". Interlink projects are those where one or more organisation such as the Royal Botanic Garden and Royal Scottish Museum get together to provide an integrated project to give a fuller understanding of a subject. For example project "Jungle" used plants, climate and animals to illustrate the topic. The society attaches great importance to the Interlink approach in environmental education.

The provision of park information and labels is the responsibility of the unit. Labels are prepared in a meaningful and attractive manner and a recent development has been the provision of special labels designed for use by children in the 5 to 7 year age group.

A small charge is made for educational services additional to the admission charge. Arrangements exist whereby Lothian region schools are admitted to the park and can use the educational programmes free of charge. Advanced bookings are necessary and many of the special projects are soon fully booked. Groups make their own travel arrangements. The service is available to anybody in the community who would

wish to use it. The staff comprises an education officer, one secretary, two assistants, one artist, one bookings officer, plus part-time staff at certain periods.

#### 5. Finance

The society finances the education programme from its revenue. This includes both capital and recurrent sums. Some capital assistance has come from trusts for the building of the education centre, but this has had to be in a three-phase operation because money available was only sufficient for two thirds of the building. The society is now urgently seeking £14 000 to complete it. The recurrent costs amounted to £14 084 in 1974 of which £2 875 was met by the Scottish Education Department and £5 000 by a grant from the city of Edinburgh.

#### 6. Publications and documentation

Royal Zoological Society of Scotland, "ZooEd 1973, A Progress Report" (private circulation only).

In preparation, "Progress Report 1973 to 75", a report on the further developments of the programme (private circulation only).

*ZooEd Services*. An annual publication dealing with the services available.

Raymond E. Chaplin, "The Educational Services at Edinburgh Zoo", *International Zoo Year Book*, Vol. XV, 1975.

Raymond E. Chaplin, "The Use of Synchronised Slide Tape Systems in a Zoo Education Service", *International Zoo Year Book*, Vol. XV, 1975.

Raymond E. Chaplin (ed.) (in preparation), *The Educational Use of Zoos*. Papers presented at the Edinburgh Conference organised by the Royal Zoological Society of Scotland and the Scottish Branch of the Institute of Biology.

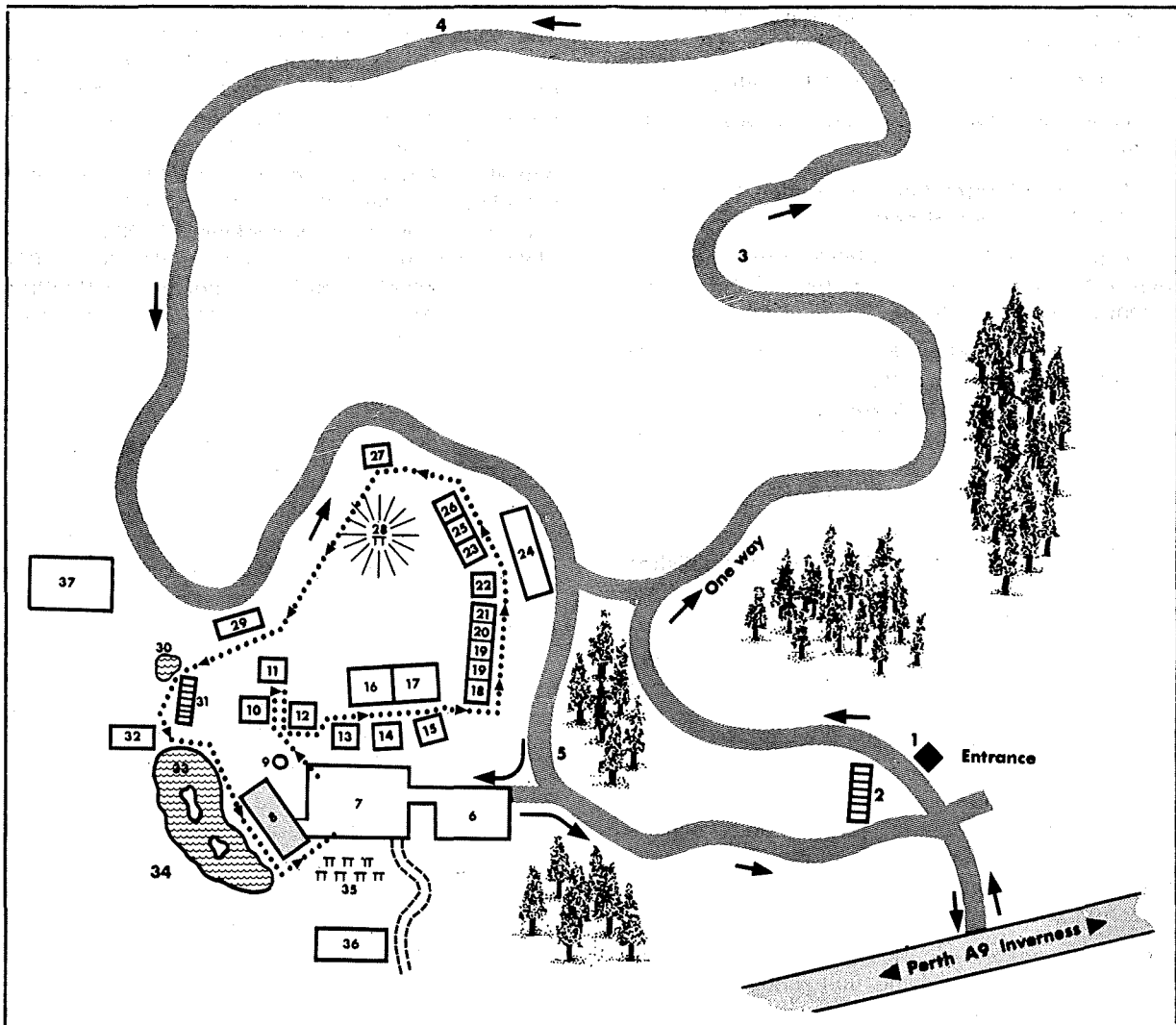
R. J. Wheeler (in preparation), *To Create an Awareness — a Zoo's Education Programme*. IUDZG, Colorado Springs, USA.

#### 7. Address

The Royal Zoological Society of Scotland, Zoological Park, Edinburgh EH12 6TS, Scotland, United Kingdom.

Education Centre, Zoological Park, Edinburgh EH12 6TS, Scotland, United Kingdom.

## 5. WILDLIFE PARKS



Guide to the Highland Wildlife Park, Kincaig. A key to the guide is found at page 51.

### Definition

*Wildlife parks:* collections of living native animals arranged in natural or semi-natural rural enclosures which give opportunities for the observation of the nature and variety of living things, their biology and behaviour, and which can be used to stimulate awareness of the relationship between man and animals and their environment.

We have already seen from the last section that wildlife parks usually differ from zoos in a number of respects. They usually have to be located in rural areas rather than urban, and although the terms "natural" and "semi-natural" enclosure are extremely difficult to define, the distinction between types 4 and 5 is rarely in doubt. It is true that many wildlife parks have

to employ cages and small enclosures, but the overall impression one gets in a wildlife park is nevertheless rural. It is also a characteristic of the best wildlife parks, such as the two examples cited in this text, that they have collections of indigenous species in their natural habitats, at least as far as this is practicable. This gives the collections an ecological emphasis and with this, opportunities to develop environmental education which scarcely exist in the zoo. What wildlife parks lack as a consequence of this approach is the extreme close-up, unless they can employ hides and binoculars. There are many providers of such facilities who would probably consider the lack of the close-up view as an advantage rather than a disadvantage, because one of the roles that wildlife parks perform which is wholly lacking in zoos is instruction in how to look at

animals in the wild, including how to dress and behave.

Wildlife parks differ from landscape or habitat gardens in that the former are usually extensive and sited in rural areas, but it would be possible to combine such types of facility and design hybrid forms between types 3 and 5. When discussing type 3 facilities we drew attention to the incompleteness of the collection and to simulation as a major artificial element and hazard in environmental education. The less good wildlife parks pay scant attention to authenticity, but no wildlife park can ever hope to be more than a partial simulation of the wild. Some of the reasons for this are discussed in our introductory section on simulation.

### Variations

In this type of facility the most interesting variations are usually to be seen in the habitat types and the indigenous animals which they feature. Thus the first of our examples is concerned with animals which are now found in forests (though they were not always forest animals and this thereby raises a special pedagogical problem). The second example is a highland and glen landscape on a site which was once forested, and it features a wide range of animals which once roamed the area.

Both facilities have developed visitor centres to interpret the environment to the general public and are developing environmental education facilities for schools. There is a contrast between the two examples in their scale of operation and in the scale of the site but both sites are large enough to make the wildlife park concept workable. This is not always the case with some other European examples.

### Problem issues

We have seen that there is a good case for making children aware of the disappearance of the wild qualities of our world. Children might be forgiven for thinking that because some animals in zoos are fierce, they are also wild. But the pristine no longer exist today, and conservation can now only reduce the amount and type of human interference by means of wildlife management, it cannot stop the clock. Man cannot recreate the wild places once they have been tamed. Even releasing animals bred in wildlife parks into the wild again may prove in the long run to be a somewhat romantic concept.

Television programmes on wildlife have established the possibility of "wildlife for the masses" but we should recognise this for what it really is, namely simulation of reality and not reality itself. Wildlife parks are essentially a form of simulation. There is the problem of matching habitats which we discovered when describing habitat gardens. If deer are fenced in enclosures smaller than their natural range they will require

the provision of extra food. Since enclosures may not have the natural controls against parasites the deer may suffer from disease. To the animal, a habitat is a collection of places each with a different function to meet that animal's needs, each niche may even have its own micro-climate. It is therefore a romantic dream to imagine that one can simply enclose part of the natural habitat and let animals enjoy their natural "freedom" in the company of thousands of visitors. The management of the wildlife park has regard to the animals' needs and also matches these with the objective of allowing animals to be seen. This is a very considerable problem which requires much research and skill. It is simply not possible to match the "natural" enclosures with equivalent wild habitats, if the animals are to be seen at all.

A further problem with animals, which does not apply to plants, is that once some animals have been bred in captivity they do not necessarily behave like wild animals, and a visit to see a wildlife park animal may not be the same as a visit to see the same animal in the wild, it may even become a pseudo-event. In the long run, some people fear that we may end up with animals in our zoos and wildlife parks which are really zoo subspecies. But the real pseudo-event is that visitors come to such facilities with no real idea of how to behave and no appreciation of the fact that man has come to love what he has destroyed. Since the justification for wildlife park collections is educational in its broadest sense, it is most important that these facilities are used for teaching conservation of wildlife and its attendant problems.

### Reference

D. Aldridge, *Wildlife Parks as Interpretive Media*, Countryside Commission for Scotland, 1969.

### Deutsche Wildstrasse, Eifel

#### 1. *Deutsche Wildstrasse, Eifel*

#### 2. *History, development and objectives*

The park was established in 1969, on the initiative of the manager of the Deutsche Wildschutzparke, Carl-Ernst Bartmann, with the support of Julius Saxler, member of the *Land Diet* and later President of the administrative district, and the district of Daun and the forest offices Daun and Gerolstein.

The objective is observation of the wildlife of central Europe in large parks which give an impression of being close to nature because of their size, but nevertheless guarantee contact with the deer. The emphasis is on the demonstration of the diversity of the central European fauna, its life cycle, its distribution, and how it is endangered today by modern civilisation. The enclosures are as large and natural as possible and are established in thinly populated areas.





*Children love to touch animals. This hand-reared roe deer fawn in the children's section of the Highland Wildlife Park likes people, so the attraction is mutual and involves no stress for the animal itself. Photograph: Highland Wildlife Park.*

### 3. Habitats

A relatively sparsely populated part of the Eifel district, 1200 km<sup>2</sup> in extent, 42 % of which is under forest cover. When it has been completed the Deutsche Wildstrasse, which is 158 km long, will cover 5 large parks and lead through a very diversified natural landscape of great cultural and geological interest.

### 4. Organisation, administration and description

Three parks have already been established:

a. Eifel Deer Park (Gondorf) contains specimens of all existing central European ungulates (e.g. red deer, fallow deer, chamois, ibex), wild boar, marmot, wildcat and snow-hare, and includes "extinct" species (e.g. lynx, wisent, aurochs and brown bear). Footpaths and deer-stalking trails lead through the forest to the areas where the deer live, some of which are separated from the visitors neither by fences or walls, nor by ditches. A wildlife exhibition, an educational display on a living community of the forest and on the deer, has been arranged by the Deutsche Waldjugend Rheinland-Pfalz, in order to make the park a place for forest and wildlife education;

b. Daun Stag and Sow Park has a forest road

10 km long where red deer and black game can be observed from the car. Deer can also be observed from high seats accessible from the forest car parks. Deer species, including elk, and wild boar can also be seen;

c. Adler-und-Falkenhof Kasselburg (Gerolstein) is a falconry with voleries for birds of prey within the castle walls. Wolf and wild horse enclosures have been attached. The falconry aims to give an appreciation of the need for protection of predatory birds.

At present the deer population of the parks totals 1 000 head.

The park is run and managed by the administration comprised of three members of staff for each deer park. Extensive maintenance work is carried out by a construction team. There are between 400 000 and 500 000 visitors each year. The entrance fees are DM 3 for adults, DM 2 for children, and DM 1.50 for school pupils on visits. An expert guide service is available if applied for in advance. The park can be visited throughout the year from sunrise to dusk, but the forest exhibition of the Deutsche Waldjugend is open only in summer.

The Deutsche Wildschutzparke Schulte-



Wrede is the biggest private enterprise concern of its kind in the Federal Republic of Germany, and runs another six parks in Western Germany. The Deutsche Wildstrasse is the biggest deer park project in Federal Republic of Germany.

In the Deutsche Wildstrasse it is planned to establish a forest park near Schönecken and an animal and forest sports park for children near Manderscheid. Preparations for setting up the small game park have already started.

#### 5. Finance

The main parks are managed by the Deutsche Wildschutzparke Schulte-Wrede, which also finances the park at Gondorf. The parks of Daun and Kasselburg are financed by the district of Daun.

#### 6. Publications and documentation

A brochure, *Deutsche Wildschutzparke*, available in German.

#### 7. Address

Carl-Ernst Bartmann, D-553 Gerolstein, Eifel. Sonnenley 69, Federal Republic of Germany.

### Highland Wildlife Park, Kincaig

#### 1. Highland Wildlife Park, Kincaig

#### 2. History, development and objectives

The Highland Wildlife Park was opened in 1972 and is a private organisation administered by a board of directors. Its objective is the interpretation of Scotland's wildlife, and for this purpose a representative collection has been built up, mainly of breeding groups in natural surroundings. All the fauna in the park is, or has been, indigenous to Scotland.

#### 3. Habitats

The park is situated at approximately 1000 feet (305 m) in the mountainous country of the Grampians, and overlooks the Insh Marshes and the Spey Valley. The habitat is representative of the

area, with heather moorland, birch and pine woodland and peat bog.

#### 4. Organisation, administration and description

The 250 acre (100 ha) site has been developed basically as a drive-through facility, with additional enclosures for small carnivores and other species unsuitable as exhibits in the open park. A fixed charge is made per car. Coach parties are charged per head. A free information leaflet, binoculars, guidebook, tape-recorded guide to the park and other aids are available to assist visitors in gaining the maximum educational value from a tour of the park. Organised school parties visit the collection from most parts of Scotland. The Director of Information/Education talks to all such parties as far as possible, lecturing with the aid of live animals for illustrative purposes. Facilities include a visitor centre, with a permanent exhibition on "Scotland's fauna through the ages". An audio-visual programme on the park's work in connection with wildlife conservation has been prepared for the 1976 season, and plans have been drawn up for an education centre, with lecture hall, to be operational by 1978.

It is the only wildlife park devoted to indigenous species in Scotland.

#### 5. Finance

No information.

#### 6. Publications and documentation

Information and interpretation material in English, including a "pre-tour briefing" for teachers and other group leaders which includes suggested projects, work-sheets etc., to be coupled with a park visit. Guide leaflet in German. Park labels and notices in several European languages. Animal lists in English, Gaelic, German, French, Dutch, Italian and Danish.

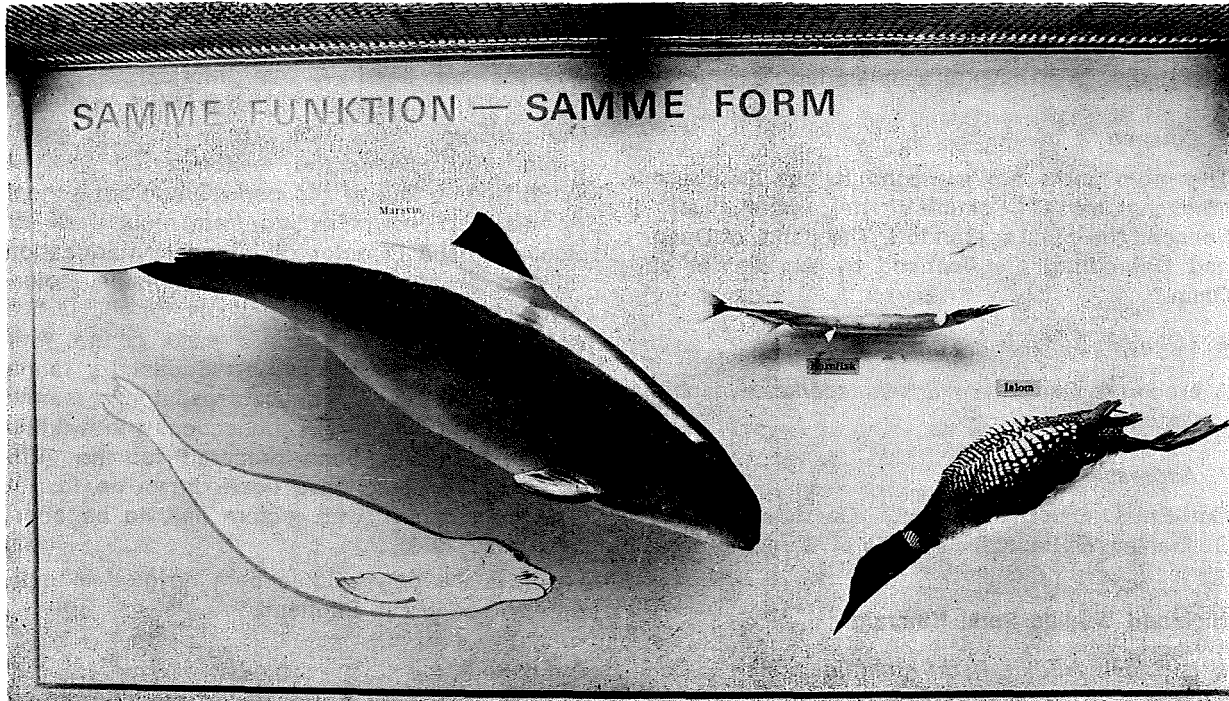
#### 7. Address

Park Director, Highland Wildlife Park, Kincaig, Kingussie, Inverness-shire, Scotland PH21 1NL, United Kingdom (Telephone: Kincaig 270).

#### Key to guide at page 48

- |  |                            |  |
|--|----------------------------|--|
| 1 Entrance.  | 12 Badger.                 | 26 Reindeer.                             |
| 2 Kennels.   | 13 Capercaillie.           | 27 Wild boar.                            |
| 3 Animals in the open park include:<br>red deer, European bison, Soay<br>sheep, Highland cattle, Alpine<br>ibex, roe deer. | 14 Pine marten.            | 28 Viewpoint.                            |
| 4 Lay-by viewpoint.  | 15 Polecat.                | 29 Arctic fox.                           |
| 5 Entrance to walk-through area.   | 16 Roe deer.               | 30 Otter pool.                           |
| 6 Coach park.  | 17 St Kilda sheep.         | 31 Grouse, ptarmigan and game-<br>birds. |
| 7 Car park.  | 18 Snowy owl.              | 32 Cranes.                               |
| 8 Cafe, shop, toilets.   | 19 White-tailed sea eagle. | 33 Wild geese, ducks, beavers.           |
| 9 World Wildlife Fund wishing well.  | 20 Golden eagle.           | 34 Wild goats.                           |
| 10 Red fox.  | 21 Eagle owl.              | 35 Picnic tables.                        |
| 11 Scottish wild cat.  | 22 Brown bear.             | 36 Children's park (pony rides).         |
|  | 23 European lynx.          | 37 Bison (winter quarters).              |
|  | 24 Wolf pack.              |  |
|  | 25 Alpine ibex.            |  |

## 6. NATIONAL MUSEMS



Example of visual instruction used in the Zoological Museum in Copenhagen.

### Definition

*National museums:* collections of specimens and artefacts which can illustrate the principles of environmental topics and offer opportunities for comparative studies in environmental education.

It would seem from the literature of the museum profession that the word "museum" has been changing its meaning, from a building which stores and displays objects illustrating natural history, antiquities etc., to a much wider concept. The main criterion would appear to be that the collection requires conservation and curatorial skills. This implies the use of a building, but the building itself can also be part of the collection. Some writers extend the definition to include structures which are not technically buildings. We have limited our field of enquiry to national and regional museums which are sited in urban areas and to environmental education. We therefore make a distinction between these and the rural museums, which tell the story of a region, or local site and visitor centres which interpret the significance and associations of a site.

Open air museums pose a peculiar problem, and we could classify them into three distinct types:

a. Those which bring together on one site

a collection of buildings and artefacts from the whole country — we call these national folk museums and include them in type 6;

b. Those which bring together on one site a collection of buildings and artefacts from the whole region and are set in that region's environment — these are regional folk museums and are also included in type 6;

c. Those which are collections of buildings and artefacts conserved *in situ* — we call these *in-situ* open air museums and other forms of site museum and include them in type 7.

One difficulty here is that it is possible to find urban equivalents to the rural site museums and visitor centres, particularly in the field of architecture and industrial archaeology. Thus the distinction between type 6 and type 7 is not an urban rural distinction. It has to do with whether the collection is *in situ* or not.

If we take as our working definition the concept of a collection housed in a building or structure, or a historic building or structure itself, and emphasise the need for conservation of the collection by a curator, we have provisions with certain distinct characteristics. They differ from some botanical gardens in zoos not by virtue of the presence or absence of a building but by the

fact that they display collections which are not living material. As we would expect, there are some exceptions — some botanical gardens have herbaria which are not living collections, some museums have live animals in aquaria, but the overall impression is not a matter of doubt.

We have already looked at some of the essential characteristics of botanical gardens and zoological gardens derived from their historical development. We are now in a position to complete this picture by adding the museum story which is essentially part of the same narrative. The museum developed in similar ways to these other facilities from the Renaissance onwards with private collectors bringing home works of art and curiosity from their travels and explorations abroad. Many of these took the form of trophies, status symbols and souvenirs. Some of them were to become national embarrassments; the Elgin Marbles, Cleopatra's Needle and the Linnaeus Collection are not matters for national pride today as they once were.

With the growth of scientific classification many museums became the repositories for the collections of botanists and archaeologists who returned home with the spoils of their expeditions. Soon museums themselves commissioned expeditions into the field to fill gaps in their collections. The utilitarian motives which were seen in herbal gardens and anatomical collections have scientific equivalents in the museum world. Even today there are some museums which have a special interest in, for example, the economic use of plants.

The conservation function of museums can have two meanings. It can be used in the sense of conserving objects in the care of the curator, or it can be used in the environmental conservation sense. The latter meaning, whilst less common, has nevertheless been developed by some museums which have taken on the role of recording and providing data about their hinterland. Some museums have greatly assisted the management of national nature reserves.

Since the 17th century there has been an almost continuous debate about the two other museum functions which we touched upon in the sections on botanical gardens and zoos — namely the entertainment and amenity aspects which are found in the idea of display, and the educational aspect which is usually thought of as a school service. Since the primary duty of every curator is to conserve the objects in his care, any additional objective can be seen as a potential threat to his order of priorities. It is not surprising therefore to find references in the literature to the general unsuitability of museums for school visits. In the 19th century some museums began to develop the educational potential and graduated from visual storage towards display. Sometimes the way in which a museum was actually used for teaching must have reached the absolute

nadir of teaching technique. This seems to have goaded other museums into the pioneer role of developing some of the best teaching techniques in use today. Such techniques stem from an understanding of what is important about a museum's specimens, which is their reality and three dimensional qualities and not the simulation of reality. Once that was fully recognised it opened the door to learning by observation and tactile experience. If some people today underrate the value of museums in education, it is possibly because the museum collections contain dead things.

In the 17th century two Edinburgh lecturers made the case for teaching with dead museum objects. Sir Andrew Balfour and Sir Robert Sibbald claimed that teaching by demonstration, which permitted students to handle the specimens, was of far greater value than lecturing. In 1893 Sir John Hutchison established an important teaching museum in the town of Haslemere. He used techniques and media fifty years ahead of his time. These included: specimens which could be handled by visitors; short labels which carried only essential information; models and pictures which related to the objects on view; books which were similarly relevant; tests, which today we should call worksheets; a micro projector to examine life in a drop of pond water. This was a very major step towards the establishment of the heuristic or discovery method of teaching. Twelve years later Miss Beatrice Vernon used the discovery method in her teaching based on Manchester City Museum to help children understand their environment. Thus the way was paved in one country for the modern techniques of environmental education and interpretation. So, in a curious way, the disadvantage of having to work with dead material seems to have been a challenge and a stimulus which led to the development of techniques which now bring the collections to life. This nevertheless requires the use of simulation techniques.

### Variations

The two national examples given in the section which follows make an interesting comparison. The organisation of the Netherlands Natural History Museums covers a wide range of sites and types of museum. The Danish example demonstrates some of the characteristics of the education departments of museums and the links which exist between museums and the municipal school system. This link system, similar to that developed in Edinburgh, is at a rather more advanced stage of development. Thus the school botanical garden, the biological collection, the zoo, the National Museum, the aquarium, and some field sites are all part of the system. It also makes an interesting comparison with the Hague School and Garden Service, and there is considerable food for thought here.

## Problem issues

There are two major issues in relation to the environmental educational use of national and regional museums in our urban centres. Together they generate a third problem which is the availability of staff and the particular forms of staff expertise, and the extent to which training courses can make contributions to the solution of these problems. The first problem is the museum's attitude to education, which is seen particularly clearly in some of the older museums where all the exhibits are displayed in such a way that it is very difficult to make use of them with school parties. This is not to say that museums do not have great potential for the employment of discovery methods, indeed we have already seen from our historical sketch that they were one of the organisations primarily responsible for some of the best modern methods of teaching. The real question is how far should a museum be reorganised for educational purposes and how far its objectives should be changed in the process. It is particularly important that there should be some balance applied to this question for we must not lose sight of the important conservation, archive and cataloguing functions of the museum. To make these subservient to an educational function would be short-sighted indeed. As far as environmental education as opposed to other forms of education is concerned, there is probably a great deal more teaching potential in the type 7 facilities than in type 6. This is because although the exhibits in national museums have undoubtedly provenance their relationship to a site cannot be observed by the student. To overcome this disadvantage in museums which have international and national collections would be almost impossible.

The second issue is related to the first and is the question of display. Many museums consider that exhibition and display is synonymous with interpretation and indeed in their terminology it is an acceptable point of view. We have to consider nevertheless that the best interpretation, in the sense which we have used the word, takes place on the site. This is because interpretation aims to reveal the significance of the site. To do this off site is fraught with many problems and in the opinion of some countryside interpretation specialists off-site interpretation is a very poor substitute for the real thing. Leaving aside the question of site interpretation, national and regional museums face a display problem which relates directly to their location in our urban centres. This is the problem of visitors who come regularly to a museum, and the resultant problems take many forms. Unlike in visitor centres and site museums the wealth of specimens on display is infinitely greater in the case of type 6 facilities than in the case of type 7. Thus visitors cannot see an entire museum in one day, whereas one hopes that they will look at the contents of a

visitor centre in a matter of minutes. In the case of the national and regional collection the return visitor can be encouraged to browse and seek the specific subjects of interest and return again as often as he wishes. The ability of such collections to change the juxtaposition of specimens for comparative or thematic purposes is almost endless and offers considerable educational possibilities. This argues for special educational services and galleries designed specifically for school use which give the greatest opportunities for the application of the discovery approach.

## References

- T. Walden, *Museums and Field Studies*, 2nd Conference on Education (Countryside in 1970), Paper No. 17, 1965.
- J. E. Smythe, "The Educational Role of Museums and Field Centres in England 1884-1966", University of Sheffield, unpublished thesis, 1966.
- S. K. Clausen, "Museums and Schools", *World Education Bulletin*, 1976.

## Haus der Natur, Salzburg

### 1. Haus der Natur, Salzburg

### 2. History, development and objectives

Inaugurated in 1924, this museum of natural history aims at presenting an easily understood display of objects, biotopes and natural phenomena (volcanic eruptions, storms, flying birds), which can be animated by the visitors themselves. Emphasis is laid on the educational aspects of the collection.

### 3. Habitats

Urban.

### 4. Organisation, administration and description

The museum receives a total of 180 000 visitors annually and is open all the year round except on 26 October, 1 November and 31 December. Permanent staff consists of museum guardians.

### 5. Finance

An admission fee is charged; in addition, the museum receives grants from the city and province of Salzburg.

### 6. Publications and documentation

An information brochure is available in German and English.

### 7. Address

Prof. DDr Eduard Paul Tratz, Augustinergasse 14, 5020 Salzburg, Austria.

## Copenhagen Zoological Museum

1. University of Copenhagen Zoological Museum:  
School Service

## 2. History, development and objectives

The school service and the zoological museum's new exhibitions were inaugurated in November 1970. The zoological museum's aims are to give as many school pupils as possible the opportunity:

- a. to use parts of the biology-education exhibition provided;
- b. to do biological work chosen by the children themselves at their own pace;
- c. to give understanding of the principles of biology and an introduction to ecology in order to help pupils think about the problems facing man's future, including threatened species of animals, pollution, the energy crisis and scarcity of natural resources.

## 3. Habitats

Urban.

## 4. Organisation, administration and description

The school service is run on democratic principles where each member of staff has a decisive influence on his daily work area through a committee system. The financial and educational responsibility is borne by a leader who is a teacher. He is a member of the main committee, known as the contact committee, which consists of delegates drawn from the staff of student guides, the school service staff and the exhibition department. The leader is also on sub-committees concerned with secretariat, work sheets, audio-visual aids, and a senior school committee.

Since the autumn of 1973 the school service has become part of the larger biological school service which comprises the zoo, aquarium, biological collection, school botanical garden, zoological museum and the school directorate of Copenhagen. These institutions have a common committee which is responsible for joint projects, joint public relations exercises and exchange of ideas.

The school service consists of twenty-five zoology students, two conscientious objectors, a secretary and a teacher. The students and the teacher run the daily activities and the secretary, teacher and conscientious objectors are responsible for the administration of the school service.

The facility offers the following activities: short lectures as an introduction to a visit to the museum, work sheets for pupils, work sheets for very young children, teaching games including ecological playing cards and an animal picture lottery, graphics and films.

No charge is made for these activities but advanced booking of at least one week is essential. In 1974 the school service took bookings for 65 500 children who visited the museum to see exhibitions.

The facility is open all the year round except public holidays. There are ten such provisions in Denmark.

## 5. Finance

In 1975 three counties agreed to an arrangement whereby they contribute to the running of the school service in proportion to the number of visitors from the schools in the counties in question.

## 6. Publications and documentation

Articles and information leaflets are available.

## 7. Address

Per Quaade, The Zoological Museum, Copenhagen, Denmark.

## Netherlands Natural History Museums

### 1. Netherlands Natural History Museums and Museum Services

#### 2. History, development and objectives

The museums of natural history in the Netherlands have very different origins. Many evolved from collections of amateur biologists and geologists, others were founded by universities, zoological gardens, missionaries and societies. Modern types of museums such as visitor centres are often set up by organisations interested in nature conservation. The oldest museum (Teyler, Haarlem) with an important mineralogical and palaeontological collection dates from 1798, the most recent museums were opened in 1975.

In order to advise the Minister of Education, Arts and Sciences, a special Advisory Committee was created in 1954. Ten years later the responsibility for museums was incorporated in the new Ministry of Culture, Recreation and Social Welfare. Since then the Advisory Committee has serviced this ministry which was staffed in 1969 with a State Adviser (Consultant) for Museums of Natural History. His functions are combined with those of the secretariat of the Advisory Committee.

Originally the aims of the Netherlands museums included the following.

The State Museums for Natural History and for Geology and Mineralogy were set up as scientific collections. The same holds for some other museums, e.g. those related to universities.

The private, local and provincial museums were often set up mainly to show their collections to the public. Often they have a scientific collection of their own area.

Nowadays four major functions prevail:

- a. the conservation of important collections;
- b. the catalogue function which enables visitors to compare what they have seen or found outside the museum with properly labelled specimens;
- c. the educational function;
- d. the function as meeting centres for amateur naturalists.

The subject matters particularly emphasised by the museums include:

a. the natural heritage of the world and of the Netherlands in particular and threats to its conservation, including the need to preserve what is left;

b. the possibilities for enjoying nature in leisure time — provided that the basic conditions for the maintenance of ecosystems are fulfilled;

c. the essential need for responsible use of natural resources, for careful management of the environment, both of which are indispensable elements in assuring the present and future well-being of mankind.

### 3. Habitats

The museums are founded in a wide variety of areas ranging from city centres to natural areas.

### 4. Organisation, administration and description

The organisations of the museums naturally differ as widely as their origins. There is no co-ordinating system but in 1974 a section of the Dutch Museum Society was set up with responsibility for museums of natural history. On the government level the organisation in the Ministry of Culture, Recreation and Social Welfare includes a Directorate-General of Cultural Affairs, a Directorate of Museums, Monuments and Archives and a Department of Museums. The State Consultant for Museums of Natural History operates within the Department of Museums. An Advisory Committee for Museums of Natural History officially advises the Minister of Culture, Recreation and Social Welfare.

It is difficult to give details of facilities except for individual institutions. Numbers of staff are often at or below the minimum for efficient functioning. The educational work is frequently understaffed. All museums are open to the public, an exception being the State Museum for Natural History (Leyden), which lacks an exhibition gallery and is open only during temporary presentations or on special request. The majority of museums charge an entrance fee. School visits are responsible for high percentages of the total visitation to Netherlands museums. The museums of natural history most frequently co-operate with local societies, school biology services and nature conservation organisations. It is not possible to make generalisations about the target public though often much is done to attract and interest the younger generations as they are easier to reach in large numbers than adults and represent our hopes for the future.

In the Netherlands there are six museums closely related to the work of the universities, fifty-two provincial municipal and private mu-

seums and some fifteen visitor centres. The latter are located at important natural sites and interpret the qualities of those sites to the general public. Most museums are open all the year round, some are closed outside the holiday season.

In the future it is expected that the following present trends will continue:

a. Increasing emphasis on the educational side;

b. Closer co-operation between museums as a result of the formation of a special section of the Dutch Museum Society in 1974;

c. More transportable exhibits aimed at reaching a wider public than the region of origin;

d. An increase in the number of visitor centres giving guidance to the public visiting natural areas. It is essential to provide interpretation to prevent irreversible damage to the natural heritage;

e. To prevent duplication of effort and finance a strategy should be designed for the location of museums and visitor centres in the country. This will be difficult to harmonise with the question of spontaneous private initiative, which should not be unnecessarily suppressed or discouraged, but nevertheless a choice of priorities has to be made.

### 5. Finance

In 1975 state support to private and municipal museums amounted to 285 000 florins. The State Museum of Natural History (Leyden) has an overall budget of about 3 500 000 florins (including salaries and wages) each year. The museums usually cover part of their expenses from entrance fees, contributions, gifts and sales of publications.

### 6. Publications and documentation

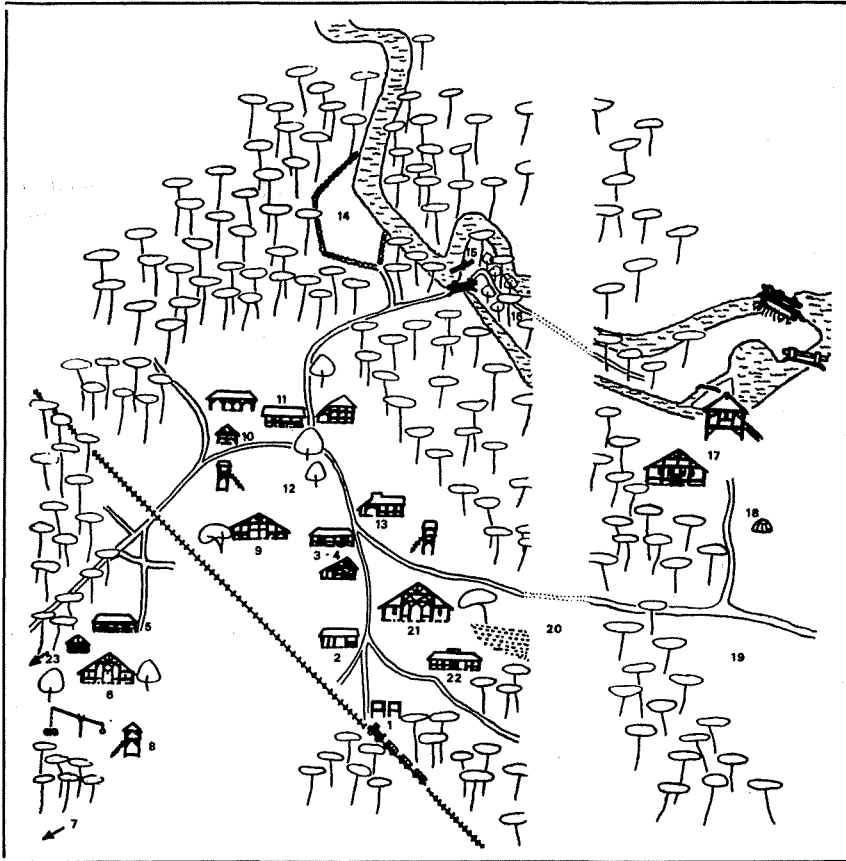
There is a guide in Dutch *De Nederlandse Musea*, edited by the Ministry of Culture Recreation and Social Welfare (latest, 6th edition, 1976). *Museologia*, edited in Amsterdam, is a journal of museum technology and education in the natural sciences. Although mainly written in Dutch it has English summaries. Many museums have booklets, folders etc. about their collections.

### 7. Addresses

For the individual museums: Mr G. M. Roding, President of the Section of Museums of Natural History, Dutch Museum Society, M. H. Tromp-laan 19, Enschede, Netherlands.

For the state organisations: Ministry of Culture, Recreation and Social Welfare, Department of Musea, Steenvoordelaan 370, Rijswijk (ZH), Netherlands.

## 7. INTERPRETIVE CENTRES AND PROVISIONS



Page of a leaflet used to inform the visitors about the Ecomuseum at Marquèze, France. The key to the guide is found at page 61.

### Definition

*Interpretive provisions:* collections of media or artefacts, simulating reality and linked to the immediate site, to demonstrate the significance of that site and the need to conserve it.

The first distinction and characteristic which must be emphasised here is the fact that these facilities do not necessarily contain collections of specimens. Even when they do contain such specimens the collections are often in the form of replicas, reconstructions and simulations of realism and are not collections of rare authentic objects which require curatorial services. The *in-situ* open air museum is an exception to this, hence the need to retain the suffix "museum" which has been touched on in the previous section.

A visitor centre is a building characterised by what it aims to achieve, namely the interpretation of a site. We use the word interpretation here because the facilities are designed primarily for the visiting public and not the schools. It is possible to design visitor centres for multi-

purpose use, and this requires the preparation of an educational plan in addition to the interpretive plan. It also requires preparation of the visiting school group and follow-up work.

There may be little point in bringing a collection of valuable museum artefacts into a visitor centre where the primary role of planning the interpretation is to demonstrate the importance of the site through its field evidence. The visit to a type 7 provision is usually a prelude to the site visit itself. Interpretation will aim to help the visitor understand the field evidence when he comes in contact with it and to appreciate its importance. If we attempt to effect indoors what is best done out of doors the centre will tend to become the purpose of the visit and eventually visitors will make journeys from one centre to the next without looking at the countryside in between.

If all the "answers" are displayed in the visitor centre then this obviously has limitations on the school use of the facilities. Educational plans can make use of visitor centres for environmental education teaching of school groups by using



them for de-briefing when the group has completed its field observations.

It is important to stress that not all interpretive plans produced for an area should result in the production of a visitor centre. The preparation of these plans requires consideration of resource management objectives for the site and selection from the inventory of raw material to produce a theme. The theme consists of a simple message relevant to site conservation which will only require the employment of a building if the media chosen for communication need to be indoors. Until one reaches the stage of deciding how the communication is to be effected it is simply not possible to say whether a visitor centre will be necessary or not. If this were not the case, then every nature trail would have a visitor centre attached to it! Type 12 facilities, guided and self-guided trails are some of the techniques which can be used to interpret a site without a building.

*In-situ* open air museums differ from visitor centres in that they are collections of buildings of historic interest. It is possible to locate a visitor centre in the historic building itself, in which case it is both part of the open air museum and also a visitor centre. It is important to realise in this hybrid case that when a visitor centre is located in one of the historic buildings of an open air museum, the visitor centre is not the whole collection, does not house the whole collection and is defined by its objective, namely the interpretation of the site. The *in-situ* open air museum's objective is, first and foremost, concerned with the curation of the collection of buildings. Where an *in-situ* open air museum does not have a building to serve these interpretive functions it may, or it may not, interpret those historic buildings. Even if it does interpret them, this will still be one of its subsidiary aims. Thus one can have open air museums in several forms: *a.* those which have no interpretation at all, *b.* those which have interpretation as a subsidiary aim and do this by one of the guide techniques (personal guide, self-guided trail, booklet guide), *c.* those which have interpretation as a subsidiary role but use one of the historic buildings as a visitor centre and, finally, *d.* those which have a purpose-built visitor centre for the subsidiary role of interpretation. The problems of planning the interpretation for each of these facilities are frequently quite distinctive.

In looking at our classification of facilities we have seen that there are different emphases given to some six major objectives:

- i. the utility or usefulness of the facility,
- ii. the scientific significance and importance,
- iii. the entertainment and amusement to be gained,
- iv. the pleasure afforded by aesthetic contemplation,
- v. the conservation role,
- vi. the education role.

Visitor centres and *in-situ* open air museums which have interpretation functions should consider all six of these roles, but undoubtedly the two most important are the conservation and education roles. Without the presence of these two our definition cannot really be applied to the facility. The utility element enters because interpretive plans have a resource management objective of channelling the public away from vulnerable areas to less vulnerable places, but they still enable visitors to see what they came to see. Naturally the casual visitor to the countryside comes to a site to obtain some enjoyment and recreational pleasure and the interpreter does not seek to preach, teach in an obtrusive manner or stifle that enjoyment. However, the interpreter has to have regard for the enjoyment of future as well as present generations and he should not design an interpretive plan which ignores this fact.

### Variations

Because the visitor centres in the survey are all in rural areas and seek to interpret the countryside, and because they aim to encourage the public to visit the actual site, it is not surprising to find that two of our examples are related to the facilities we associate with wildlife parks. They are actually natural areas rather than wildlife parks, *sensu stricto*, hence their inclusion in type 7 rather than in type 5, but they employ hides and similar techniques so the public can observe wildlife without disturbing it. As with wildlife parks, so here we find that some of the more interesting variations in this group can be seen by comparing different habitats. The first four of our examples in type 7 demonstrate some interesting variations of this kind. The Lowes and Solling Wald Centres are sited in areas which have a wildlife refuge status, whilst the Esbjerg Fisheries Museum is concerned with the ecology of the Waddensea and the Marqu ze Ecomuseum is concerned with an ethnological approach to cultural landscapes of great fascination, where the hand of man has had considerable effects. These examples serve to demonstrate that environmental education and conservation studies are central to type 7 facilities and that the end result can be achieved either by the ecological or the ethnological approach to the study of the relationship between man and his environment.

### Problem issues

One of the most difficult problems in relation to this group of facilities stems from the general low priority given to interpretation and the lack of understanding of the philosophy of interpretation. This gives rise to insufficient funds and a general dearth of interpretive planners. It is not uncommon therefore to come across facilities such as visitor centres which have been produced without an interpretive plan at all, and which do not interpret the site significance. Such centres frequently do not help the resource management



plan for the site and may actually increase the problems of an area instead of contributing towards their solution. Sometimes the visitor centres are built without a proper consideration of whether there is a case for such a provision, or a justification for the centre being sited at a particular location. Another problem which is frequently met with is that parts of the story being communicated out of doors would be better told indoors and vice versa. In all these cases the root cause is often that the proposed centre was designed before the planning process really began.

#### References

- Peak Park Planning Board, *Peak District National Park Development Plan Review XII*, Information and Interpretation Service, 1966.
- G. B. Thompson, "Policies and Progress of the Ulster Folk Museum", *Country Life Museums*, Countryside Commission for Scotland, 1972.
- D. Aldridge, "An Ideal National Pattern", *Country Life Museums*, Countryside Commission and Scottish Country Life Museum Trust, 1972.
- B. Lambie, "Research and the Local Folk Museum", *Country Life Museums*, Countryside Commission for Scotland, 1972.
- J. T. Coppock, "The Location of Open Air Museums", *Country Life Museums*, Countryside Commission for Scotland, 1972.
- D. Aldridge, *Guide to Countryside Interpretation: Part I, Principles of Countryside Interpretation and Interpretive Planning*, Her Majesty's Stationery Office, 1975.

### Esbjerg Fisheries Museum

1. *Fiskerimuseet, Esbjerg (Esbjerg Fisheries Museum)*

#### 2. History, development and objectives

The museum was opened on 24 April 1968. Its objectives are educational, social and scientific. The emphasis is on Danish fisheries and the natural history of the Waddensea.

#### 3. Habitats

The open Waddensea.

#### 4. Organisation, administration and description

The museum has a classroom with episcope, diascope and a 8mm film projector with films about Danish fisheries. There is a laboratory for educational use by schools, teachers, students and adults which has fifteen microscopes. No charge is made for the use of these facilities but the visitor pays the normal entrance fee.

Two biologists work at the aquarium assisted by voluntary teachers. The teaching is normally provided by the visiting staff of classes or student groups. Visiting groups can make use of material provided by the museum for investigation by prior arrangement. Advance booking of these facilities

at least a week ahead is essential. Students visit the Waddens just outside the museum to collect specimens and then use the laboratory to study their own collection. The use of the Waddens for environmental education, and the laboratory facilities and the museum of natural history of the Waddensea, are all part of a planned educational visit and operate as a unit.

The staff of the museum advise teachers and help them to use the museum facilities on condition that they state the purpose of their visit clearly. A small fishing vessel is at the disposal of biology groups. Each summer a week's course for biology teachers is arranged in the Waddensea area.

The museum is the only institution of its kind in Denmark and the only one which provides information of an educational nature about the Waddensea. Work on the museum of natural history is still in progress.

#### 5. Finance

The museum is financed by private funds, local and state grants.

#### 6. Publications and documentation

A wide range of publications is available, including guides to the aquarium and museum and more general descriptions of fisheries past and present, the biology of important fish, the ecology of the Waddensea, the geography of the Danish west coast etc. Some of the publications are related to the exhibits and others supply more general background information.

#### 7. Address

Fiskerimuseet, Saltvandsakvariet, DK-6700, Esbjerg, Denmark.

### Marquèze Ecomuseum

1. *Ecomuseum of the Grande-Lande at Marquèze*

#### 2. History, development and objectives

The centre was set up by the Association for the Planning of the Aquitaine Coast to serve as a pilot project for the regional nature park of the Landes of Gascogne, created in 1971. The programme for this scheme was drawn up under the supervision of Mr G. H. Rivière, a member of ICOM who acts as permanent adviser.

The aim is to conserve a district of the Grande-Lande as a piece of living evidence of the occupation of the landscape. This conservation project includes dwelling houses, farm buildings, fields, woods, meadows, gardens, a mill area and pine forests. Thus the aim is to conserve plant and animal species, including a flock of Landaise sheep, in order to make the public aware of environmental problems for which man has a responsibility, and to bear witness to the agro-pastoral civilisations in the Landes as expressed

in its buildings, furniture and artefacts. These ethnological aspects of the work are performed in co-operation with existing bodies such as the INRA (National Institute for Agronomic Research) and the Museum d'histoire naturelle de Paris (laboratoire d'ethnoscience).

### 3. Habitats

The countryside of the Grande-Lande is comprised of five main elements: the area around the buildings, the pine forest, the fields, the heathlands, which are being re-established, and the river with its mill area.

### 4. Organisation, administration and description

The Ecomuseum is managed by the Regional Nature Park Administration. Staff include an interpreter, a studies co-ordinator, an agricultural technician, a curator of the collections, a caretaker-worker and a shepherd. Future plans include work on Teich Ornithological Park in the Gironde, Leyre River Environmental Education Trails and Luxey Resin Ecomuseum.

The museum, although not yet completed, is open to the public. Many schoolchildren visit the park and are received by guides and, for two months of the year (May and June), by a primary school teacher. Appointments must be made in advance. In 1974, 6 000 children visited the park to use these services. There are also many adult visitors, the majority of whom come between 15 June and 15 September; outside these times visits are made by appointment only for groups. In 1974, 30 000 adult visitors came to the park. Visitors come by train to the village of Sabres; cars cannot be parked near the visitor centre. The journey by train is an excellent approach to the whole subject area as it affords a complete change of scenery and gives an opportunity for observation of the countryside during the journey.

The centre and park are open for school visits or groups by appointment from 23 March to 15 June and from 15 September to 11 November. Visits by the public may be made on Sundays and public holidays between 24 March and 11 November and every day from 15 June to 15 September.

All French nature parks are initiating schemes of this type in their areas, and half a dozen have been established in France to date.

### 5. Finance

Since the scheme is new, considerable amounts of money still have to be invested, amounting to several tens of millions of francs. The money comes from state funds. The operational budget is, however, the responsibility of the Joint Management Association of the park, and in 1976 it amounted to 200 000 F.

### 6. Publications and documentation

A guide is available for visitors in French.

### 7. Address

Mr Ollangnier, Director of the Regional Nature Park, and Mr Lalanne, in charge of studies and co-ordination at the Marquèze Ecomuseum, Municipality of Sabres, France.

## Solling Forest Museum

### 1. Solling Forest Museum

#### 2. History, development and objectives

The facility was opened on 22 May 1975. It was designed by Oberforstmeister i. R. Karl-Heinz Dauster, Herzberg/Harz, and constructed by Staatliches Forstamt of Neuhaus Solling. The museum attempts to represent the complexity of the forest as a living community of plant and animal organisms, to describe this with regard to the ecological function and to ensure its protection by the populace.

### 3. Habitats

The forest museum is in the deer park of Neuhaus, a large forest area of the nature park of Solling-Vogler. It is a much frequented deer park near the well-known health resort of Neuhaus. The visitor centre was deliberately located in this strategic position rather than in a more remote situation in the forest, and it is easily accessible on foot from the local resort.

### 4. Organisation, administration and description

The visitor centre is situated close to the entrance of the deer park and has an area of 150 m<sup>2</sup>. The exhibition on forest ecology and economics is illustrated with photographs, maps and models. The policy that "no animal had to die for the museum" means that stuffed animals are not used as exhibits.

The centre deals with such subjects as plant and animal species, the growth of a tree and of the whole forest, fossil trees and vegetation from the past, traditional and modern forestry compared, the economic use of timber, and ecology and landscape. The visitor can use push button devices to illuminate slide transparencies, show slide sequences on monitors and play back tape-recordings of animal calls.

The forest museum and deer park are managed by the Staatliches Forstamt of Neuhaus Solling.

Payment for admission to the deer park gives free entrance to the museum but booked school classes can visit the facilities with a reduction of charge. Guided tours are given only by special arrangement. The museum is visited by patients from the health resort, tourists and school pupils in groups. The deer park and the forest museum are visited by more than 100 000 visitors during the year.

## 5. Finance

The institution is financed by the Forest Administration of Lower Saxony. Construction costs amounted to more than DM 350 000; DM 120 000 of this sum was for the building. The construction was financed from a special fund of the Ministry of Agriculture and Forests of Lower Saxony.

## 6. Publications

A brochure is available in German.

## 7. Address

Oberforstmeister Greinert, Staatliches Forstamt, 3450 Holzminden 2, Neuhaus im Solling, Federal Republic of Germany.

## Loch of the Lowes Visitor Centre

### 1. Loch of the Lowes Wildlife Reserve and Visitor Centre (Scottish Wildlife Trust)

### 2. History, development and objectives

The reserve was purchased in 1969 and an observation hide for public use was provided early in 1970. Within two years visitor numbers had reached a level which necessitated the provision of further facilities and in June 1972 a small visitor centre was opened. Use of the centre by school parties has been encouraged, and in 1974 nearly 1800 schoolchildren visited the reserve.

The primary objective in managing the reserve is maintenance of the existing diversity of habitats and wildlife. An important secondary aim is to foster an understanding of conservation, among both adults and children. Much of the reserve is vulnerable to trampling and disturbance and this restricts severely the extent to which it can be used for educational purposes.

### 3. Habitats

Situated at the very edge of the Highlands, the Loch of the Lowes is overlooked by rugged hill country to the north. The reserve itself comprises the lake (90 ha) and surrounding woodland fringe, reed-bed and marsh (8 ha).

### 4. Organisation, administration and description

The Scottish Wildlife Trust is a voluntary and charitable organisation supported largely by

members' subscriptions. It has local branches throughout Scotland and a sub-committee of the trust's Perth branch is responsible for management of the Loch of the Lowes Reserve and Centre. A full-time ranger is employed on the reserve, and during the summer he has the help of a seasonal assistant and a team of voluntary wardens.

From April to September inclusive the centre is open between 10 a.m. and dusk; the observation hide is never closed. School parties, the majority of which are in the age range 10-12 years, normally spend about an hour and a half at the reserve. During this time the children, who are always accompanied by their own teachers, visit the observation hide, follow up this experience with a visit to the interpretive exhibition and see a slide programme presented by the ranger. A special boardwalk entrance was made to the hide in early 1976 for the use of handicapped persons.

## 5. Finance

No charge is made for admission to the reserve or centre but donations are invited. The reserve was purchased with financial help from charitable trusts; government grant-aid (through the Countryside Commission for Scotland) was obtained for the construction of facilities and also contributes 75% of the salary and expenses of the ranger and his seasonal assistant.

The capital cost of the visitor centre and exhibition was £10 000; in 1974 running expenses for the building were £500. The ranger's annual salary and expenses amount to £2 200 and his seasonal assistant's to £600.

## 6. Publications and documentation

A range of publications relating to the reserve has been produced, including a leaflet series designed specifically for children.

## 7. Address

Scottish Wildlife Trust, 8 Dublin Street, Edinburgh EH1 3PP, Scotland, United Kingdom.

Reserve Ranger, Maurice Drummond, Butterstone Schoolhouse, by Dunkeld, Perthshire, Scotland, United Kingdom.

## Key to guide at page 57

### Information

- 1 Information board.
- 2 Information Office.
- 3 Rest room - key-map of the park.
- 4 Presentation of the land.
- 5 (diorama).

Alternative walk - the functioning of local economy

- 6 Housing: Maison du Mineur 1772.
- 7 Fields: rye, basic food.
- 8 The hen-house.
- 9 The sheep-pen.
- 10 The pig-house.
- 11 Experimental bee-hive.
- 12 The "airial": typical way of settlement.
- 13 Bread oven.
- 14 Pasture.
- 15 Washing place.
- 16 A shaded path.
- 17 The millsite.
- 18 The charcoal burner.
- 19 Pine seedling.
- 20 Tapered pine trees.
21. The world of the inhabitants.
- 22 The sharecroppers.
- 23 Picnic area.

## 8. COUNTRYSIDE DAY CENTRES



*Pupils studying soil collected in the surroundings of the day-centre.*

### **Definition**

*Countryside day centres:* rural field study sites and centres used for environmental education and environmental interpretation with facilities designed for day use.

At this point in the survey we are making a slight change in approach and are now concerned with opportunities which exist for rural field work. These type 8 facilities can be distinguished from the previous types, either because they are in rural areas and hence differ from the urban equivalents (types 1, 2, 3, 4 and 6) or because they make major provisions for schools and differ from those rural types which are not designed for school use (types 5 and 7).

To take an example, school gardens often have farm demonstrations consisting of facilities which give opportunities for children to care for living organisms, as we saw in type 1. On the other hand type 8 facilities will include visits to operational farms in rural areas, and type 11

facilities may feature imitative experiments which take the form of historic farming demonstrations. Thus we have three different forms of emphasis in what might broadly be termed farm studies.

Botanical gardens, habitat gardens, zoological gardens and wildlife parks give children opportunities to see collections of plants and animals, whilst type 8 facilities include not dissimilar opportunities to observe plants and animals but not in the form of collections. The diversity of the rural habitat is the key issue under consideration here.

Most of the centres in type 8 have classrooms and laboratories for school use. Interpretation of the countryside can be effected by interpretive trails, guided or self guided, or by booklets and guide books, and these features will be seen in the examples chosen. It is also apparent that type 8 facilities include either a site museum or visitor centre for the general public and therefore have a use which is not exclusive to schools.

## Variations

From the above it should follow that the most interesting variations are to be seen in the range of rural habitats. In this connection it is worth looking in the vertical column 8 in our chart to see other rural facilities in addition to those given primary emphasis in this section. The vertical column 8, shows that there is a rural element of the type considered here to be found also in types 5, 7, 9, 10, 11 and 12. The range of study areas covered by this rural field work is as follows:

- a. farmland — arable crops, ley and improved grass pasture, permanent grassland and meadow, hedges and walls,
- b. streams, rivers, ponds, lakes, freshwater marshes and reed beds; fenland,
- c. woodland and forest,
- d. rough grazing land — heath and downland, bog and moorland, mountain,
- e. coastal habitats — sandy beaches, rocky coasts and cliffs, and dunes and salt marsh estuary,
- f. quarries, disused railway cuttings and embankments, canals, industrial archaeological features such as aqueducts, viaducts and mills, waste or derelict ground, refuse tips and open space not listed under rural elsewhere,
- g. archaeological and historic sites, churches, villages and rural settlements.

We have discussed elsewhere the two approaches of ecological and ethnological groups of disciplines, and here we can see the application of this particularly clearly.

## Problem issues

The type 8 facilities can be arranged in a kind of spectrum from the country park to the wilderness area. Type 8.1 is a "park, which by reason of its position in relation to major concentrations of population affords convenient opportunities to the public for enjoyment of the countryside". From an environmental education point of view, it has some similarities with urban parks and school grounds, for it occupies a position in our concentric system as one of the starting points for most children. It is the first countryside that the urban child experiences. Since urban children frequently lack contact with the soil and plant and animal life and do not understand their dependence on these, this experience is of the utmost importance. The country park has therefore a preparatory role as an introduction to the proper use of the countryside, and is a way of extending the work of the urban park in this respect.

Type 10.7 in Iceland is a residential field study centre located on a remote and mountainous fjord, which we mention here because it can be regarded as a kind of wilderness site comple-

tely at the other end of our spectrum of habitats. At least in geological terms it might be thought of as a national nature reserve. We have suggested that this type of educational experience should normally come very late in the student's school experience of field work in most countries. Obviously Iceland is an exception. Certainly in the case of reserves which are selected for the scientific significance of their wildlife, rather than for their educational potential, there are some conservationists who think that such areas are unsuitable for environmental education and that schools should develop their own educational reserves instead. 10.7 is actually an example of this.

Between these two extremes we find study areas which offer special opportunities and have particular problems. Farm studies is a most vexed area where there has been much attention to detail and little fundamental thought about objectives. In the context of environmental education and interpretation, a farm can offer many opportunities for understanding changing land use, for looking at the ecological effects of farming activities on the landscape, and for the study of ethnological comparisons between types of farming in different areas or in different periods of time. In practice this potential is rarely realised, and the significance of farming is missed in a welter of irrelevance.

This can be seen more clearly if we consider some of the best work which is done in environmental education on estates composed of a mixture of arable land, pasture, woodland or forest. The study of an estate makes it clear because there is an element of continuity in the rural scene and an understanding of change which relates to a long period of time and to the long-term effects of land-use decisions. Its study requires multidisciplinary work and an integrated curriculum to see the full significance of the proprietary interest, the need for care and the importance of responsibility and accountability which are both an inseparable part of the conservation management of estates. Visits to estates situated near urban schools give opportunities for a development of the concentric system which is, in a way, both centrifugal and centripetal. By this we mean that the schools can maintain continued contact with the estate and make comparisons between different study areas on the estate. This helps to develop a sense of responsibility on the part of the students, who may come to realise that estates demonstrate the interdependence of different land uses perhaps better than any other kind of site.

The cultural landscapes of farms and estates give opportunities for the study of archaeological and historic settlements. The ethnological technique of comparing the plan and siting of buildings can, for example, be used to start an enquiry on environmental education which may shed more light on the effect of farming systems on land-

scape and on local communities than any study of milking parlours!

Between the intensively used agricultural landscapes and the remote wilderness areas of the European scene there are, in some countries, areas of extensive agricultural land use with rough grazing and uncultivated areas left in a semi-natural state for sporting activity. In this group we should include mountains, bogs, cliffs and coasts. Without discussing the complications of what different countries mean by nature reserve, nature park and national park, it is often the case that areas of marginal importance to agriculture are designated for wildlife conservation, recreational use and sport. Their potential use in environmental education should depend on why they were set aside or designated as being of national importance. Thus the true wildlife reserve of national significance will not encourage environmental education use. But some reserves will have a degree of controlled public use and may consider employing interpretation to assist the translation of a management plan into effective action. Others will be virtually national recreation areas, encouraging a wide range of public provisions including some for environmental education. One should not be misled by these designations, which are no guide to the place of an area on our hypothetical spectrum of types of park. There are two important criteria to consider in selecting such areas for environmental education. The first is the reason for designating the area as worthy of protection and conservation, which is what the Americans called "park value". The second is whether the park value is such that it can be recreated by man. If this is not the case the area could be at considerable risk from educational visits, though one must assume that an area of this national importance will have an effective management plan which will aid its protection. The exact nature of the resource and its vulnerability will help to determine the degree of public access and the type of provisions which can be encouraged.

We have seen that the designation of countryside areas for wildlife or landscape conservation is a form of collecting "natural" areas with the consequent need to manage (a curatorial service) effectively. A park system operating as a kind of spectrum of different types, rather than the hierarchy in which some areas are considered to be better than others, makes most sense if it is assisted by a park service. A field service of this kind, consisting of rangers and interpreters, can translate management policies and agreements into practice. The ranger's role is therefore of vital importance not only to the interpretation and education functions that a park may have but to the conservation of the area itself.

#### References

Forestry Commission, "Forestry and the Town School", "Starting a School Forest", and "Forestry in

Schools", *British Forestry*, Her Majesty's Stationery Office, 1972, 1972, 1974. Association of Agriculture: I. V. Young, *Farm Visits*; P. Cadbury and A. S. Cork, *Chapman's Hill School Farm Experiment*, 1972 and 1974.

*Nature Conservation at the Coast*, Appendix XIII, "A Survey of the Education and Research Use of the Coastline of England and Wales", Her Majesty's Stationery Office, 1972.

R. Blain, "Country Park and Mountain Properties"; T. Brewis, "Farms"; Viscount Arbuthnott, "Forests and Estates"; W. J. G. Eggeling, "Nature Reserves", *Education and the Countryside*, Committee on Education and the Countryside, and Countryside Commission for Scotland, 1973.

G.P. Black, "The Role of Extractive Sites in Geological Research", *Proceedings of the Royal Geological Society*, London, A339, 1974; and "Distribution of Student Field Instruction in Geology in Britain", *Welsh Geological Quarterly*, 1 (4).

## Culzean Country Park

### 1. Culzean Country Park, Ayrshire

### 2. History, development and objectives

Much of the county of Ayrshire including Culzean and its policies has been in the ownership of the Kennedy family for centuries. With this long history of management the property of the Robert Adam designed castle and 531 acres was given to the National Trust for Scotland in 1945 by the fifth Marquess of Ailsa. The trust's principal aim has been to manage Culzean for its visitors but always to preserve its character and atmosphere. In the early years the trust's limited resources were directed towards maintenance of the castle and gardens. In 1969, following the creation of the Countryside Commission for Scotland, the 531 acres excluding the castle were declared Scotland's first country park. With the full support of the commission and the three participating local authorities, the trust was able to undertake major developments in both the Adam designed Home Farm, restored as a reception exhibition centre in 1973, and the estate. Visitor numbers increased from 117 000 in 1970 to 292 000 in 1975. With the increased facilities and widely varying grounds set amidst magnificent coastal scenery, but within an hour's travelling of heavily populated areas, Culzean is ideally suited to the purposes of a country park.

### 3. Habitats

The property is situated amongst rich Ayrshire farmland overlooking the Firth of Clyde. Habitats range from exotic gardens and 130 acres of intensely managed agricultural land, through 290 acres of mixed woodland, ponds and streams, to wilder cliff and shore communities.

### 4. Organisation, administration and description

Since reorganisation of local government in 1975, the Joint Committee administering the park consists of the trust as owners and managers, with



representatives from four district authorities and Strathclyde region. The trust's representative in the area has overall responsibility for the park and castle. The trust's area surveyor works from Culzean, and there is a Principal/Chief Ranger, Head Gardener and Head Forester. Secretarial, maintenance, car parking, shop and restaurant staffs, with seasonal helpers, bring the total number of employees up to approximately eighty during the summer. The Chief Ranger of the trust is also based on Culzean.

The former Home Farm, now the park centre, includes the following:

- an auditorium for introducing slide shows, evening talks and discussions, seating 80,

- exhibition area in three rooms,

- schools space (two simple laboratory rooms, catering for briefing and follow-up work on school visits),

- self-service restaurant seating 200,

- trust shop,

- toilets,

- shelter for picnics in bad weather,

- administrative offices and a house.

With a full time assistant Ranger, secretary, and seasonal helpers, the Principal of the park centre provides an interpretive service through a published programme of guided walks and evening talks for all interested visitors.

A service is also offered to schools and organised parties of many kinds. All such bookings involving use of any facilities at Culzean are dealt with centrally.

Many of the 340 schools visiting the park come during the summer term with recreation as their chief aim. Rangers deal with only a proportion of the total of 19 000 pupils from 340 schools. With a maximum of 20 pupils with each ranger, emphasis is on the quality and relevance of such short day visits to work done in school.

#### 5. Finance

Capital: 75% of all approved capital development is paid for by central government (Scottish Development Department) on advice of the Countryside Commission for Scotland. The remaining 25% is paid for by the four district authorities and Strathclyde Region. The ranger service including staff, vehicles, equipment and litter collection are also grant-aided.

Revenue: running expenses are shared by four district authorities and Strathclyde Regional Council. There is a parking charge for cars and buses but admission to the park centre and ranger services are free.

#### 6. Voluntary or compulsory

Both.

#### 7. Publications and documentation

Schomberg Scott, A.R.I.B.A., *Culzean Castle Guidebook*.

Douglas Bremmer, B.Sc., *Country Park Guidebook*.

Park ranger staff, *Geology Scenery and Pebbles*.

Park Ranger Staff, *Culzean's Birdlife*.

Exhibition guide.

Facilities and booking form.

Ranger events leaflet.

Worksheets for schools.

#### 8. Address

Culzean Country Park, near Maybole, Ayrshire KA19 8LE, Scotland, United Kingdom.

### Beaulieu Countryside Centre

#### 1. Beaulieu Countryside Centre

#### 2. History, development and objectives

The education service was established on the Beaulieu Manor estate in 1972, as a result of a decision by the owner, Lord Montagu of Beaulieu. In 1975, the service was registered as an independent charity, the Countryside Education Trust, based at Beaulieu, but able to operate throughout the UK.

The trust aims to:

- a. provide increased access to the countryside in general, particularly Beaulieu Manor and the New Forest area, for the general public and young people in organised groups;

- b. provide educational and interpretive services designed to stimulate public interest in and care for the beauty and character of the countryside;

- c. promote and assist in conservation activities, including the restoration and preservation of buildings of national, historic or scientific interest.

The subject matter is concerned mainly with the countryside, including conservation, ecology, woodland management, farming, ornithology, estuarine biology and local history, geography and history of transport.

#### 3. Habitats

Beaulieu is a private estate of over 3 000 ha, lying entirely within the boundary of the New Forest on the north shore of the Solent. It is comprised of 1 400 ha of agricultural land, 800 ha of woodland, and 400 ha of river and salt marsh, and includes a coastal bird sanctuary (Grade 1 Nature Conservancy site), two villages, Beaulieu Abbey and Palace House, a maritime museum and the National Motor Museum.

#### 4. Organisation, administration and description

The administration is by a charitable trust, and the staff comprises one Director, one personal assistant and a limited number of volunteers. The Director is responsible for planning services, producing materials, developing all facilities and raising funds. He is a qualified teacher and graduate ecologist.

The facilities offered include farm visits, woodland nursery visits, field study sites, nature trails, a riverside walk, river cruises, educational parks, work sheets and other associated publications.

The visitors are mainly young people who come in organised groups drawn from the 7-18 year old age range. There is a smaller number of adult visitors — teachers and teachers in training, students from further education and higher education establishments, and members of natural history groups. Advice and information is given to individual students up to the post-graduate level.

The number of visitors making use of the trust's services is approximately 25 000 each year, and this is gradually increasing. The facilities are open every day except Christmas Day. The majority of visits are for one day only. Per capita charges are made to help cover running costs. Most visits must be booked in advance. No direct teaching service is offered, but the trust provides services and facilities for teachers. The Director offers briefing for groups of teachers or teachers in training. The services are available to anyone wishing to make use of them.

Plans for the future include a woodland interpretive centre, a network of nature trails and open air displays, a river interpretive centre, an agricultural and country craft museum, a residential farm centre, and "work-boats" for estuarine studies.

In addition to the development of services on the Beaulieu Manor estate, the trust provides advice to other landowners who wish to develop their own educational programme.

#### 5. Finance

The running costs of £10 000 to £12 000 per annum are raised by the Director and trustees from grant-making trusts, local and national industry, and fund-raising events. The number of services for which per capita charges are made will have to be increased to cover running costs within the next five years. No local authority grants are, as yet, received.

#### 6. Publications and documentation

Teachers' packs are available, and there is a wide variety of information sheets, work sheets, project books, visitor packs, official documents and trail guides. All publications are in English only.

#### 7. Address

P. G. Carter M.I.Biol., Director, Countryside Education Trust, Beaulieu Manor, Hampshire SO4 7ZN, United Kingdom (Telephone: Beaulieu 612345).

#### Bois de St-Pierre

##### 1. Bois de St-Pierre

##### 2. History, development and objectives

This comprehensive unit was founded in 1968 on the initiative of the town of Poitiers and the Ministry for Youth and Sport. The objectives are educational and social. It was designed initially to provide a leisure area for town dwellers and then developed as an open air centre.

##### 3. Habitats

Two hundred and thirty-three hectares of wooded hills, ponds and meadows, with a bordering stream.

##### 4. Organisation, administration and description

The facilities include two car parks of 1 ha each; 5 ha of playground area; 8 km of footpaths; a picnic area with shelters, tables and benches; two ponds, a pool with a surface area of 2 ha in which fishing is permitted every weekend between 1 June and 1 October; a rock garden; an animal park; three units with classrooms for theoretical and practical work; pony trekking and horse riding facilities; an open air centre; a reception centre for non-Catholic scouts (*éclaireurs*); facilities for the study of botany and animal life by school children and temporary exhibitions. Three circular swimming-pools and waterworks for recreation are under construction. A "farm for children" will also be provided.

A physical education master from the Ministry for Youth and Sport is in charge of open air activities; in particular he gets in touch with the primary and secondary schools of the urban community in order to stimulate and organise such activities.

So far the facility has no other teaching staff, as a decision to appoint them awaits agreement between the municipality and the Ministry of Education. Administration is in the hands of the Poitiers Park Department. There are six or seven full-time maintenance workers.

The number of visitors averages one class per day and up to 2 000 people on fine weekends. A bus service was provided but this has had to be abandoned. The provision is open all the year round, and it caters for all age groups. Advance booking is essential. There are plans to provide residential facilities in the future.

##### 5. Finance

Two million francs granted by the municipality and the Ministries of Agriculture and Youth and



Sport were made available for investment in equipment.

#### 6. Publications and documentation

A pamphlet is available in French only.

#### 7. Address

Bois de St-Pierre, Mairie de Poitiers, France.

### **Slangerup Nature Park**

#### 1. Naturparken Mellem Farum og Slangerup (Slangerup Nature Park)

#### 2. History, development and objectives

The park was established in 1942. It is partly a private enterprise and partly State Forest Department. The objectives are educational in the field of natural and cultural history, and aim to demonstrate a typical east Danish landscape before the coming of the industrial revolution.

#### 3. Habitats

A typical 19th century Danish landscape.

#### 4. Organisation, administration and description

The park is a typical old Danish landscape with forests, fields, villages, old churches, stone age and bronze age monuments, interesting geology and varied botany and zoology especially in the forest and lakes. It is not being developed as a museum but there is control of felling and drainage of lakes. There is also planning control to prevent the building of summer houses in the vicinity of the forest, lakes, churches, and stone age monuments.

Naturparken is about 20 to 30 km from Copenhagen, and the forests and lakes are visited at weekends by many people from the city. During the week, primary school and senior high school pupils and students from the university make geological, botanical and historical excursions into the park. There are a few field camps, but most students make day visits only.

The naturparken is used by all school systems for studying botany, zoology, forest and lake ecology, Danish history (including stone and bronze age archaeology, 800 year old churches, and agricultural landscapes), and geology of the glacial and post-glacial period.

The park is open all the year. No other facilities of this kind exist in Denmark at present.

#### 5. Finance

No information available.

#### 6. Publications and documentation

Carl Tscherning (ed.), *Naturparken Mellem Farum og Slangerup*, Kobenhagen, 1965 (306 pages). This book is useful for the preparation of educational visits. Two general pamphlets are also available. All publications are in Danish only.

#### 7. Address

Naturparken Mellem Farum og Slangerup, c/o Tscherning, Lindevangsvej 32, DK - 3460 Birkerød, Denmark.

### **Ballesbaekgård**

#### 1. Ballesbaekgård, Rørbaek Sø

#### 2. History, development and objectives

The facility was established in 1969 by the Conservation Planning Committee for Vejle county on behalf of the Ministry of Cultural Affairs (now Ministry of Environmental Affairs). Its objective is to conserve the Lake of Rørbaek Sø and its surroundings and in 1962, these areas were conserved by means of a conservation declaration. The ministry acquired the property of Ballesbaekgård in 1965 and established a recreation area for the public. Thus the property of Ballesbaekgård was acquired not only to protect the very vulnerable part of the landscape but also as a means to guide and attract the public. The location offered good possibilities for establishing car parks and paths and the property comprises about 21 ha, a farmhouse and some farm buildings. One of the farm buildings proved suitable for establishing a visitor centre or mini-museum, which was opened to the public in 1970. In 1973 a neighbouring property (a fishery) was bought by the ministry so that the whole property now comprises 23.5 ha.

#### 3. Habitats

The landscape is the result of ice age phenomena including fluvio-glacial and sub-glacial stream trench-systems, with some very deep and characteristic kettle holes in the bottom of the trench-systems. Rørbaek Sø and Lillesø are the best examples of these features.

#### 4. Organisation, administration and description

This landscape offers interesting possibilities to visitors for enjoying the beautiful natural scenery, fishing, bird watching and other natural history studies.

The Conservation Planning Committee and the State Forestry are responsible to the ministry for all activities and for the maintenance of buildings, parking lots and the protection of the landscape. Other staff take care of daily maintenance and the cafeteria.

Since the landscape is under heavy visitor pressure the conservation authorities established interpretive facilities to guide and attract the public. The whole region offers many possibilities for geological, botanical, zoological and historic studies. An example is the famous "Haervej" (an ancient trackway) which runs through Jutland and crosses the region. The visitor centre features maps, photographs and plates which trace the Haervej and tell the story of the trackway. Exhi-

bition cases show stone age finds and how the region was formed. The centre is open all the year round although in the winter it is only open at weekends. It is the only centre of its kind in Denmark.

A study was made in June and July 1971 which indicated that over 60% of the visitors went to the visitor centre and 95% walked to the lake overlook. Over 40% made use of the 0.7 km long path, while a smaller percentage used the somewhat longer path. The most significant result of the investigation showed that 95% of those questioned left their cars to walk through the area. Three quarters of those questioned were family groups. A comparison of the ages of visitors with the national average showed that there was some tendency towards overrepresentation of younger age-groups, in particular the 25 to 44 year old group. Compared to the national average, there was an underrepresentation of unskilled workers, housewives and pensioners, on the other hand skilled workers and students were overrepresented. The total number of visitors a year is about 50 000 persons. The use of the car park and the visitor centre is free of charge. There is no overnight accommodation at the location itself but a large private camping site is located nearby.

#### 5. Finance

The Ministry of Environmental Affairs acquired the properties in 1965 and 1973 for DKr 650 000. The buildings and the cafeteria are rented for about DKr 1 000.

#### 6. Publications and documentation

The Conservation Planning Committee has produced a general pamphlet, which is free and can be obtained in the visitor centre and cafeteria, and is also available in the tourist bureau of the county of Vejle. It is only available in Danish.

#### 7. Address

Henry Jensen, Ballesbaekgård, Vesterland, DK - 7324 Thyregod, Denmark.

### **Wildenrath Environmental Education Park**

#### 1. Environmental Education Park, Haus Wildenrath

#### 2. History, development and objectives

The park was founded in 1967 on the initiative of the community of Wegberg in the framework of the National Park Schwalm-Nette. The planner and scientific adviser is Dr Dahmen (Landschaftsverband Rheinland).

The objective is to promote knowledge of the special characteristics and structure of nature and of the repercussions of the various kinds of land use on nature and the landscape by taking as an example a diversified landscape with its

variety of rocks, water, soils, flora and fauna and the numerous interrelationships between these. The emphasis is therefore on ecology.

#### 3. Habitat

Cultivated landscapes used by agriculture and forestry with beech, oak and alder, dry and wet heath and molinia grasslands.

#### 4. Organisation, administration and description

In the past the community of Wildenrath was responsible for the scheme, and it has now been integrated into the town of Wegberg. Scientific supervision is by Dr Dahmen and local supervision and maintenance by municipal workers. The facilities are maintained by town and district authorities.

The Environmental Education Park of approximately 50 ha, and includes two relatively unspoilt sections of landscape of the Lower Rhine region which are typical of that part of Germany:

- a. the edge of the main terrace of the Rhine and Maas Rivers with beech-oak and alder marsh forests in the area around the source of the Schaagbach,
- b. dry and wet heath and moor grass meadows (Molinia) on the slopes of the upper Schaagbach Valley.

In the area around the sources of the Schaagbach there are four nature trails on different subjects and various hydrological observation points. A walk around one trail takes between fifteen and forty-five minutes. The six trails are as follows:

- i. cultural historical,
- ii. geological-pedological,
- iii. hydrological observation points,
- iv. floral trail,
- v. vegetation trail,
- vi. topographical trail.

The last of these leads from the source of the Schaagbach to the expansion area at the Cuhberg and via the village of Wildenrath towards the parking area.

The trails are marked by simple signs. Figures in the signs indicate the corresponding sections of a printed guidebook, in which the individual subjects are described in detail in text and pictures; special importance is attached to the aspects of landscape and autecology.

In the summer of 1975 a visitors' building was completed near the Haus Wildenrath farm consisting of: one classroom for 25 persons, two living rooms, one shop, toilet accommodation, two bedrooms for 10 persons, one open air terrace with tables and chairs. Groups and classes can be instructed in this building by their own teachers or leaders. The park is visited by individuals, school classes, university groups and

cultural societies. Since entrance is free and there is no permanent supervision, no exact figures on the number of visitors can be provided. There is car parking space for thirty-five vehicles. The facilities open throughout the year and the visitors building can be used if booked in advance.

In the future there are plans to turn rooms in the visitors' building into bedrooms to enable visiting groups to stay for several days. Further information to service an introduction to the trails and hydrological observation points and to act as a guide to animal observation is being prepared. As Haus Wildenrath has not been lived in for several years it is in a bad state of repair. Restoration and modernisation is planned, and when this work is completed a farm for demonstration purposes (historical and modern biological) is to be established to demonstrate that farmers and foresters are an essential factor in the management of the cultivated landscape.

#### 5. Finance

The area has been purchased by the community of Wildenrath for DM 360 000; it was turned into a park with funds of approximately DM 500 000 made available by the district authorities, the Landschaftsverband Rheinland, the Land North Rhine-Westphalia and the federal government (nature park funds). The cost included that of the visitors' building.

#### 6. Publications and documentation

The guide to the floral trails is available in Dutch. A leaflet *Exploration of the Environmental Education Park Haus Wildenrath I* with ten contributions by experts and five maps in full colour is available in German. Volume II is in preparation.

#### 7. Address

Stadtdirektor der Stadt Wegberg, Wegberg, Rathaus, Federal Republic of Germany.

## 9. COUNTRYSIDE RESIDENTIAL CAMPS



*Pupils making a quadrat count on a rocky shore near camp. Photograph: Knockadoon Nature Study Centre, Ireland.*

### Definition

*Residential school camps:* accommodation for school parties used for environmental education field work with staff provided by the visiting school.

Type 9 facilities are used exclusively by school groups during their full-time school careers, though some camps are also used for childrens' holidays and fieldwork in vacation time. The main point is that they are not dominantly leisure centres. Schools bring their own teaching staff to these camps.

These facilities usually differ from type 8 in having residential accommodation or in having no visits by adults for the purposes of study and none by the visiting public either.

### Variations

The variations which will be seen to occur with this type of facility are in

a. The number of days during which teaching takes place, varying from two to eight days;

b. The objectives, which vary from ecological and geographical environmental studies to mixed courses with an outdoor pursuits element;

c. The habitat types which range from farmland and forest to several coastal types but all with a variety of habitats offering good opportunities for fieldwork;

d. The age range catered for by the camps, from 10 - 13 years to 12 - 17 years. It is interesting to note here that some countries have a policy which aims to give a precise number of these field study experiences to their pupils at least once during the school career and even three times;

e. The staffing of the camps which is usually effected by the teachers from the visiting schools; but here we should draw attention to the Swedish system of local contact teachers who assist the visiting groups. Since the examples given here are all local authority financed, to some degree, it is worth considering the advantages which can result from the Swedish system and which can overcome some of the intrinsic drawbacks of the camp school, compared with the residential field study centres of type 10.

## Problem issues

Surveys have been made of facilities for fieldwork in England, Wales and Scotland to assess the extent to which such provisions are available and to make recommendations for the future. These surveys were carried out in 1965, 1969 and 1970 and at the outset they were beset by problems of definition. Whilst the term field study centre (type 10) is reasonably well understood in the UK it is much more difficult to decide on the criteria for a survey of other environmental education study centres. One of the essential criteria which the survey adopted was to enquire about the existence or otherwise of classrooms, laboratories and equipment for fieldwork. There are in the UK youth hostels which provide special facilities for fieldwork of this kind, and these are generally considered to be a minimum requirement which any meaningful survey of environmental education facilities must take into account.

A second problem which arises partially from this is the extent to which courses mixing environmental education fieldwork with outdoor pursuits should be counted in the survey. In studies of mountain areas or water bodies, there is an essential outdoor pursuits element in the instruction, to enable the groups to travel over mountain terrain or to work with boats in safety. It is the emphasis which is given to mountain or water pursuits that is the main criterion here, and this is not an easy decision to make. Another aspect of the problem which is frequently put forward is that combined field study and outdoor pursuit centres give the environmental educationists a chance to meet their opposite numbers in a sporting field and to explain their work. As outdoor pursuits leaders and instructors approach middle age, and as their employers get nervous about accidents which sometimes occur in the hills or on water, so there is an increase in the interest shown in field studies and environmental education. However at the moment countries which have an interest in outdoor pursuits tend to give more financial support to sporting activities than to fieldwork. To the environmental educationist this represents a wasted opportunity, but he should remember that if he takes groups into mountain country or in boats he must be as well qualified as the outdoor pursuits centre instructor.

In the surveys referred to above the conclusions included a number of points particularly relevant to school camps which also apply to field study centres. For example, it was found that there was a need for more full-time qualified staff to run the residential centres. It was stated that strict attention should be paid to the UK Outdoor Studies Code, and that vulnerable areas should only be visited by groups undertaking specialist studies which could not be conducted elsewhere. It followed that more use should be made of those sites in the home area which were not so vul-

nerable to pressure, in short the employment of the concentric system which is the basis of this survey. Another conclusion of special relevance to both types 8 and 9 was that with younger age groups day trips were preferable to the use of residential centres, although "young" was not precisely defined. It is nevertheless a point for consideration and certainly the issues are well understood at Herlev, where the youngest groups making residential visits attend for only two days. The reasoning behind the suggestion was not so much that young children should not be away from home for more than one night, but that residential centres should be reserved for those in-depth studies made by older children which cannot be made by a series of day visits. Finally, the survey recommended that there was a need for teacher training to include much more about fieldwork methods than is the case at present.

## Danish Camp Schools

### *1. Camp Schools and Environmental Education Centres in Denmark*

The camp schools of the municipality of Herlev are used as an example of these Danish facilities.

### *2. History, development and objectives*

In the 1930s the idea of giving school pupils more enjoyment and understanding of nature by transferring part of their education to school camps in the countryside gained such strong support that a considerable number of municipalities in Denmark now have camp school activities like the one described here.

The object of camp schools is both social and educational. As children stay at camp schools for several days and nights the pupils spend all of their time in each others' company, and it has been found that this has a positive and beneficial effect on their social behaviour.

In the 1930s, simultaneously with the growth of camp schools came the rise of the youth hostel movement, and a number of youth hostels were built in Denmark. Many of these are used for camp school purposes. The rather primitive form of accommodation, close contact with nature, and the outdoor activities help the pupils to perceive things more intensely by first-hand observation, particularly in history, geography and biology.

In the years following the 2nd world war many municipalities invested money in summer holiday camps. It was found that these camps were often empty during the school term and as the camp school idea gained ground it was natural to locate the activities of summer camps with the camp schools and youth hostels. Sometimes this made the latter financially viable and kept the expenses of accommodation down to an acceptable level.

The emphasis is on translating theory into

practice and helping students to observe their natural surroundings and examine and study the interdependence of man, animals and plants and other environmental factors. In the upper forms, much importance is attached to the social objectives of camp schools. An attempt is made to give pupils a greater understanding and tolerance in their relationship with other people. The contact between teachers and pupils necessitated by the close confinement imposed by the nature of the facilities contributes greatly towards the increase in social consciousness.

### 3. Habitats

The three camp schools of Herlev municipality education authorities are all in either woodland or coastal locations. One of the camp schools is situated in North Zealand, about 45 km from Herlev in a recreation area with spruce plantation and sand dunes. This camp school is used by the youngest pupils, 10 to 13 years, for short stays of two to five days' duration. The second camp school is located in west Denmark, in Jutland, close to the North Sea in a farming and forestry area. Students can visit the provincial towns to study economic geography, and in the district there are relicts of stone age kitchen middens and related artefacts. The area is ideal for the study of history, geography and biology. The third of the school camps is situated on Bornholm, an island in the Baltic Sea 160 km east of Copenhagen. This island is famous for its characteristic geological features which are therefore the main subject of study for most parties. The island is also well suited for other camp school activities concerned with environmental studies and has proved a very popular location. Trade, agriculture, fishing and connected industries have all been the subject of school projects on the island.

In general all groups are encouraged to study the fauna of the coastal areas, the forest and fields.

### 4. Organisation, administration and description

The camp schools do not have their own staff of teachers or administrators. This work is done by the school authorities in Herlev with the help of some domestic staff employed at the camp schools concerned with catering and maintenance. The school authorities pay the wages of these camp school staff. They also employ a part-time consultant who is responsible for the day-to-day administration of the camp school. Teaching is done by the visiting staff and generally there are two teachers for each class visit. Most frequently one of these teachers specialises in social studies and general science.

The main use of the camp schools is in the spring from early April to the beginning of June, and in the autumn from August to October. During the school holidays from 20 June to 12 August camp schools are used to give schoolchildren in

Herlev a holiday. In the spring and autumn the camp schools run to absolute capacity.

During his school career a pupil has the opportunity of attending a camp school on three occasions: when he is 12 to 13 years of age he may attend camp school for up to five days, when he is 14 to 16 he may attend for up to six days and when he is 16 to 17 years he can attend camp school for up to eight days.

Bookings must be made six months in advance. In principle camp schools are open to everybody, but non-members have to pay the municipality for board and lodging and must defray all other expenses connected with their stay.

It is not known how many camp schools exist in Denmark but a survey is in preparation. At present there are no plans to extend the camp school projects but there is a growth in international activities in which Danish schools visit camps in Sweden, Norway, Austria and Holland.

### 5. Finance

The municipality is responsible for financial control. At present it subsidises each participant to the extent of DKr 42.67 per day. In addition free transport is provided to and from the camp school.

### 6. Publications and documentation

All documentation is in Danish.

### 7. Address

Mr N.J. Bisgard, Director, Herlev Municipality Education Department, Cultural Services, Bygaden 90, DK-2730, Denmark.

## Irish Camp Schools

### 1. Irish Camp Schools: Knockadoon

### 2. History, development and objectives

The camp was established in 1924 and was used for field work in 1971. The objective is educational.

### 3. Habitats

Sea-shore, bog-land and forested areas.

### 4. Organisation, administration and description

Each course caters for 45 students of secondary schools in Ireland. A fee of £17 per course per person is charged. There is public transport only within 6 miles of the centre. Courses are fully booked each year and advanced booking is essential. The courses are conducted by a fully professional staff resident at the centre for the duration of the programme.

### 5. Finance

Courses are financed by students' fees.

## 6. *Publications and documentation*

A brochure is available.

## 7. *Address*

Father R. H. Talty, O.P, Ennismore, Montenotte, Cork, Ireland. The address of the Knockadoon Field Study Centre is Knockadoon Holiday Camp, Ballymacoda, County Cork, Ireland.

## **Norwegian Camp Schools**

### 1. *Camp Schools in Norway*

#### 2. *History, development and objectives*

There are approximately thirty camp schools which are regularly used by schools in Norway, and they are widely distributed across the country. The aim of the camp schools is to provide pupils with insight into an environment which is different to their home area. The pupils study a particular environment from a structure/functional point of view. This usually leads them to develop a desire to preserve the environment which they have come to know. The Norwegian Camp School Association has emphasised the importance of studying nature conservation and environmental issues in its most recent camp programmes.

#### 3. *Habitats*

Mountain habitats.

#### 4. *Organisation, administration and description*

Pupils may attend camp schools at any time between the fourth and ninth grades, but in practice they usually do so in the sixth grade. The length of the camp stay is normally for one week, but it is always preceded by intensive preparation and followed up by discussion and reviews when the pupils return to their own schools.

The content of the camp school programmes may include any of the following: rural history, ecology, the experience of nature, mountain farming, conservation work, environmental work, common-sense rules for living with nature, behaviour in the mountains, mountain safety rules.

It is the objective of the Norwegian state approved curriculum that all Norwegian children should stay at a camp school once during the nine years in which they attend basic schooling.

#### 5. *Finance*

No information.

#### 6. *Publications and documentation*

None.

#### 7. *Address*

Norwegian Camp School Association, Oslo, Norway.

## **Swedish Camp Schools**

### 1. *Camp Schools in Sweden*

#### 2. *History, development and objectives*

The aims are educational and are concerned with field study in environmental education.

#### 3. *Habitats*

Various habitats in Sweden.

#### 4. *Organisation, administration and description*

Arrangements for camp schools are organised by a special department of the Swedish Touring Club, which is a travel agency. The club books accommodation, transportation, and excursions. It provides all parties with the necessary information and handout material necessary for the preparation of field studies.

The normal length of stay at a field study centre or camp school is five days, but shorter bookings are sometimes accepted. The club employs three teachers in its field study department who handle the teaching arrangements, which include the preparation of material and instructions for teachers, manuals and broad sheets, equipment and the training and co-ordinating of the local contact teachers. They also can make bookings with hotels and youth hostels, if these are suitable for field studies. They are responsible for keeping the material at each of the camps up to date, and effect this in collaboration with the local contact teachers.

The club has provided eleven camp schools with equipment which includes film projectors, maps, books, microscopes, blackboards, tape recorders and similar aids. Colour slides are available for use by pupils or parents.

The main field study period begins in the middle of April and ends at the beginning of June. During this period in 1974, 7 200 pupils and teachers participated in field study activities. During the whole of the year in 1974 there were some 9 000 participants.

The majority of pupils taking part in field studies are aged 12 to 16 years. There are relatively fewer classes from the integrated upper secondary school age group of 16 to 19 years. Student teachers from colleges of education make considerable use of the field study centres.

The staff student ratio for most of the field work is one to fifteen. Visiting teachers can get in touch with the local contact teacher at the field study centre for advice on booking study visits with industrial concerns, rural authorities, farms and the like. Local contact teachers do not take part in the field excursions and teaching.

The National Board of Education's curriculum, written in 1969, states that every pupil should make at least one field study excursion

during his school career. However, financial and budgetary control for field work rests with the local authorities.

### 5. Finance

The cost of accommodation varies from SKr 138 per person to SKr 204 per person. This charge includes four days at full pension, broad sheets and information and advice from the local contact teacher, but not transport.

### 6. Publications and documentation

The information sheets available cover such subjects as flora, fauna, weather, historical monuments, settlement, local authorities, churches, schools, trade and industry, communications and folklore. The provision of this information in no way interferes with the individual teacher's freedom to plan his own fieldwork.

### 7. Address

Swedish Touring Club, Fack, 103-80 Stockholm, Sweden.

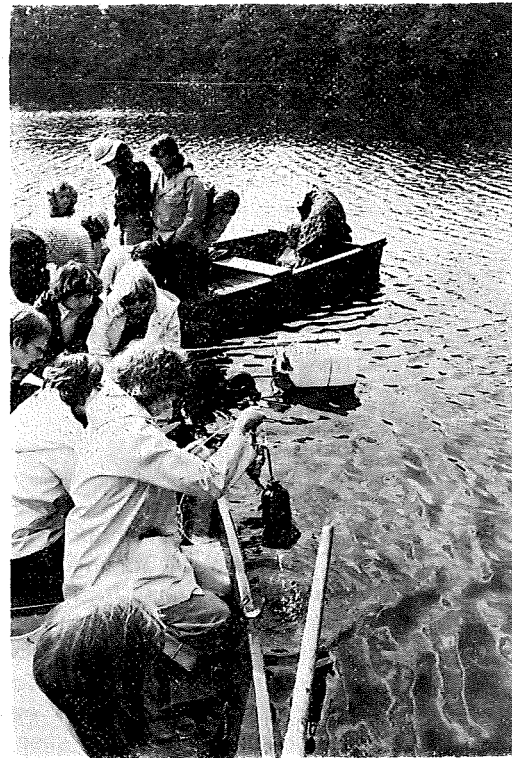


## 10. COUNTRYSIDE RESIDENTIAL FIELD STUDY CENTRES



*Pupils involved in nature management.*

Photograph: Naturskolen Fiskebaekhus, Denmark.



*In the Botanical Station at Heiliges Meer (West Germany) students have the possibility to do hydrobiological research work.*

### Definition

*Residential field study centres:* accommodation for school and adult parties for environmental education field work with permanent residential staff and, essentially, providing classroom and laboratory facilities.

Type 10 naturally has some points in common with type 9 facilities. The objectives are the same in each case, as are the subjects taught. There are however some important differences of emphasis. The inclusion of adults in the work of the centre (in the jargon: permanent education) is important. These adult courses are examples of environmental education rather than environmental interpretation, for the following reasons:

a. They teach skills and concepts rather than give environmental messages about site significance (although they may do both);

b. They are not designed to channel visitors through a landscape from station to station on a trail but aim to give discovery experience at certain study points (stations) which may be investi-

gated in depth for considerable lengths of time (although the centres must have regard for the conservation of their local resources);

c. They make use of preparation and follow-up sessions before and after the field experience in classrooms and laboratories, and not all their studies are necessarily made at local sites (although some adult courses eliminate these preparatory stages);

d. The adult course member attends a field study centre to work and is not a casual visitor, therefore the fieldworker does not need to use simulation techniques to condense large quantities of field experience into a short time (though some centres make good use of simulation techniques to compare their local sites with field evidence from more distant sites);

e. Fieldwork is not always thematic but when it uses a theme this is usually taken from one or two subject disciplines and is confined to examining the inter-relationships between them, unlike interpretive themes which are best developed as

multidisciplinary narratives and where there is no possibility of in-depth enquiry by the visitor in the time available.

Thus type 10 facilities differ considerably from the interpretive facilities of type 7 and 12.

Another major criterion which distinguishes type 9 from type 10 is the fact that field study centres have their own residential staff, and we shall examine the implications of this in more detail in a moment. The distinction between these two types has nothing to do with the permanence or otherwise of the building; not all camp schools are held under canvas and some type 9 facilities are equipped with classrooms and laboratories.

Type 9 and 10 differ from type 8 in that they allow studies to be made over a longer period than is possible with day visits. Even a series of visits made on a daily basis at a type 8 centre may not achieve the same objectives and results as the residential experience at a type 10 field study centre.

### Variations

One of the most important variations here is the wide range of administrative organisations responsible for these facilities. In some ways this is a measure of the fact that their value is widely recognised at a time when local education authorities have not found it possible to justify the purchase of residential centres for their own catchment areas. The case can more easily be made to justify such provisions on a country-wide or national basis to ensure optimum use. Thus we find museums, universities, private education trusts and companies with an interest in environmental education making these provisions. The local enthusiasm of groups of teachers has also sometimes shown the way. It is to be hoped that where camps can become residential field study centres, once this potential is recognised by local authorities the necessary staff appointments will be made.

The aims of field study centres are predominantly concerned with environmental education but, as we saw in our discussion of the definition, there is sometimes an outdoor pursuits element and still more frequently a social element. It is to be expected, therefore, that the aims and objectives and their expression in the range of subjects studied will make interesting comparisons. The ecological and ethnological approaches can be seen here and we also have a good representation in our sample of the special problems of teaching in national parks. The teaching in the French Pyrenees National Park has a most comprehensive coverage which is truly concerned with the total environment. The English Peak District National Park runs courses which are about the area as a national park, which is a unique approach.

Fussing Nature School (10.2) is included in

this group of facilities despite the fact that it is not residential. It is really a hybrid type between 8 and 10, and it was placed here because it has its own residential specialist staff, it caters only for children and it has more in common with the other features found in type 10 provisions than with the type 8. It is used exclusively by the pupils of local schools and consequently its lack of residential facilities is much less important than the frequency of visits which the classes make to the centre.

### Problem issues

The residential centre and camp share advantages over the day centre which are partly social and partly pedagogical; these come together when we consider the benefits of the actual residential experience itself. There is a kind of enthusiasm which can motivate the most unlikely children to work with energy and joy for long hours, entirely voluntarily, because interest has been kindled. Many other benefits accrue which are particularly relevant to the development of responsibility and inter-personal relations. It is instructive to total the number of hours a five-day residential course represents and to compare this figure with the number of hours a student spends on environmental education during a school term. Like some brands of Vodka the effect can be shattering! But whilst the student is gaining all that first-hand field experience, widening his horizons, learning the synoptic, aesthetic, symbolic, synnoetic and empirical skills, exercising his natural curiosity and receiving training in citizenship etc., back at the school other teachers are considering how to make up the "losses" in their own subjects.

Basically this problem is one of curriculum design, for how else can one speak of a loss in such circumstances? One of the possible solutions to this problem is to take the whole school to a camp at one time and this is done in some countries. Another is to have a centrally imposed curriculum which structures the fieldwork in a programme whereby there is no "loss" at all. A third solution is to appoint a member of staff for a local authority education department whose special responsibility is to develop the curriculum and hold staff meetings about possible multidisciplinary approaches in classroom work and fieldwork.

We have seen that type 10 are distinguished from type 9 facilities by virtue of the provision of residential staff at the field study centre. Why do we suggest that it is so particularly desirable to have permanent teaching staff attached to these centres? The school class that leaves the home area with its own teachers has surely some advantages over the school that sends a smaller group of its pupils to join students from other schools at a permanently staffed field study centre. But many of these advantages are ad-

ministrative rather than pedagogical. One major issue here is the possibility of releasing a teacher in term time from the classroom and the problem of how to cover his classes whilst he is absent. This can be overcome to a limited extent, as we have seen, if a large and self-contained section of the school goes away to camp at one time. The residential field study centre taking small groups from several schools cannot expect the groups to be accompanied by their own teachers and the two most common solutions to the problem are the one just mentioned of the large school camp and, secondly, the residential centre with its own staff.

Nevertheless, residential centres offer additional advantages in the form of the expertise of a team of environmental education specialists. These teachers know the subject, how to teach it, and also have a deep knowledge of the area. Furthermore, as they have to live in the environment as part of the local community, they must develop a regard for the conservation of the local resource. They are able to monitor this resource and its educational use. Fieldwork has to be linked with the development of the conservation ethic for practical reasons. It is possible for students to take part in this monitoring of a local resource to a much greater extent than is the case with school camps.

The criteria for selecting possible residential field study centres must have regard to such factors as the habitat structure and variety of fieldwork opportunities within easy walking distance of the centre; the distances from the field study centre to the main population centres of its catchment area; the road and rail network in these areas; the climate, in particular the rainfall which, whilst it does not prohibit fieldwork altogether, nevertheless increases the hazards; the avoidance of vulnerable areas of high scientific interest; the preference for areas which can accept some disturbance in relation to expected levels of use and to the capacity of the environment for recovery and natural replacement; and finally, and perhaps most important of all, the need to avoid over-use of the local population, who should not become the victims of questionnaire surveys.

#### References

- A. Herbert, P. Oswald and C. A. Sinker, *Centres for Field Studies in England and Wales: The Results of a Questionnaire Survey in 1969*, Field Studies, Vol. 3, No. 4, 1972.
- Committee on Education and the Countryside, *Outdoor Study Centres in Scotland*, 1970.
- P. M. Thomlinson (ed.), *Field Studies in Northern Ireland; Field Study Conduct; Field Study Centres*, Queens University, Belfast Teachers' Centre, 1975.

### Fiskebaekhus Naturskolen

#### 1. Fiskebaekhus Naturskolen (Fiskebaekhus Nature School)

#### 2. History, development and objectives

The facilities were established in 1972 by the municipalities of Ballerup, Gladsaxe, Herlev, Vaerlose and by the State Forestry.

The educational objective is to give children an experience of nature in the forest.

#### 3. Habitat

Woodland

#### 4. Organisation, administration and description

The nature school is managed by a board which is responsible for the running and financial control. At least two board meetings are held in every school year. The board consists of: the Director of Education and a teacher's council representative from each of the municipalities of Ballerup, Gladsaxe, Herlev and Vaerløse, the forest supervisor of the Copenhagen Forest District, and the forester of Fiskebaekhus woodland plot who also acts as Secretary to the board.

The Fiskebaekhus woodland plot comprises Ryget Skov, Farum Sø, Norreskoven, the Kollakolle fields, Aasevang- and the forests of Bøndernes Hegn and Østerhegn.

Normally, classes stay in the district around the nature school for a period of three to four hours according to the season and subject studied. But it is also possible to arrange longer individual visits if work has been prepared in advance. The duration of visits varies from one hour's duration to a week. In every case, the forester tries to give the children a concentrated nature experience, alternating theory with practical work. Experience has shown that pupils get the greatest benefit if the teacher books in advance and both pupils and teacher thoroughly prepare the subject. During their stay at the school the subject is treated in the field by the collection of data and material which is later followed up by teachers and pupils at home and in the pupils' own school. Groups often arrange an exhibition on their work so that other children in their school may benefit from their observations. Schools make use of the facility at many different stages. For example, in the second form, the pupils visit the nature school and use the forest as a subject for the development of language and ideas. They look at trees and learn new words and concepts. In the fourth form, the pupils return and work with the trees of the forest, learn their names, watch the wildlife and so on. In the seventh form, the pupils make another visit and work on environmental and ecological systems studying plants and animals. In the course of the eighth to tenth school years, the pupils visit the nature school for the last time and investigate such matters as forestry as an industry, pollution and other environmental matters.

A class may also work intensively with the nature school during the course of a whole school

year and walk the same nature trail in spring, summer, autumn and winter. There is no specific method, no strictly planned programme for all groups or stereotyped written tasks to be performed in connection with the work of the nature school. The scope is endless.

#### *The nature trail*

There is a 1.5 km nature trail starting and finishing at the nature school. It winds through various types of forest and soil and the route is marked with some 150 small labels giving information on a variety of subjects *en route*. The nature trail can be used freely by all age groups. However, it is recommended that major group visits intending to use this facility should book in advance by telephone to the office so that the staff of the nature school can organise the visitation of groups and avoid overcrowding or over-use. The final stop on the nature trail is a camp-fire site where the walk can be finished and visitors can eat the food they have brought along with them. Some groups, for instance, enjoy roasting sausages or baking rolls over a fire. There is wood for camp-fires at this site.

#### *Notification and advanced booking*

In order to facilitate planning it is important that all visits must be booked in advance in writing or by telephone to the nature school. The total number of visits made by pupils is 4 000 per year, in addition to which there are large numbers of adults. The latter mostly consist of interested groups of citizens from the four municipalities. In total the nature school serves about 28 000 children and adolescents from some forty schools.

#### *5. Finance*

The municipalities have paid for the establishment of the nature school and are currently defraying the operational expenses. The state forestry donated the area for the school building and the teaching facilities. Costs are about \$ 10 000 per year.

#### *6. Publications*

Available in Danish.

#### *7. Address*

Naturskolen, Fiskebaekhus, 3520 Farum, Denmark (Telephone: (02) 95.00.95, between noon and 2.00 p.m. only).

### **Fussingø Nature School**

#### *1. Fussingø Nature School*

#### *2. History, development and objectives*

The school was established on the initiative of the state forest district in January 1973 and formalised in January 1974. It is run by a council

representing the schools and the district. Its objectives are to create a direct and personal contact with nature and to give students a respect for and understanding of the unique values, vulnerability and health fostering qualities of the environment.

#### *3. Habitats*

The school is established on an old estate which includes broad leaf and coniferous forest areas, farmland, lakes and bogs. There is a conifer saw mill, a building dating from 1795 and the setting is a fluvial glacial landscape of hills and valleys.

#### *4. Organisation, administration and description*

The centre is used for day visits of three to five hours' duration by school classes. An introduction is given to the children by a ranger. Classes study the geological, biological and silvicultural aspects of the day excursion. The children collect materials and observations and obtain a feeling of direct contact with nature, which can be followed up later in the classroom. Occasionally other groups of teachers or adults receive courses at the school.

Administration is by the council and a contact group of teachers and district staff with day-to-day administration by the district, in co-operation with one of the municipality education systems acting as economy secretariat. The staff consists of a District Officer and a ranger.

The facilities include a classroom for 30 persons, and three small group seminar rooms located in an old half-timbered wing of the main building. The school is used by children of all ages and 100 to 150 visits are made each year. Transport is provided by the visiting school. Advance booking is an advantage, usually between ten days' and two months' notice is given of visits. The school is open all the year round except for school vacations.

Future plans include experiments which will combine the primary aims with more curriculum-oriented studies in biology and history. It is not however intended to dilute the primary aim.

#### *5. Finance*

The schools using the Fussingø Nature School share costs proportionate to the total number of classes. Annually some DKr 20 000 to 30 000 is used to finance some 600 classes from the local communities of Randers and Purhus.

#### *6. Publications and documentation*

Documentation is in Danish only.

#### *7. Address*

Naturskolen på Fussingø, DK-8900 Randers, Denmark.

## Permanent Centre for Environmental Initiation

### 1. Centre permanent d'initiation à l'environnement (Permanent Centre for Environmental Initiation)

#### 2. History, development and objectives

The centre (CPIE) was founded in 1974. In June 1972 a project for the establishment of the centre was worked out at local level by teachers from the Ministries of Education and Agriculture. Plans were submitted to the Prefect of the Hautes Pyrénées. The project was then forwarded to the relevant departments of the Ministry of the Environment, and elicited a promise from the Minister on the occasion of his visit to the national park in September 1972 that a centre of this kind be established.

On 1 February 1973, the Prefect of the Hautes-Pyrénées convened a meeting and reported to the Minister with the object of obtaining appropriations from the FIANE (Investment and Action Fund for Environment and Nature). On the 5 February, the same committee met at Bagnères to draw up an inventory of the premises and assess its potential for environmental education. On 4 June 1973, the committee, under the chairmanship of the Prefect, was attended by representatives of the Ministries of the Environment, Agriculture and Education, the State Secretariat for Youth and Sport, the Regional Representative for the Environment and by prominent local persons. The representative of the Ministry of the Environment announced that the establishment of the CPIE at Bagnères-de-Bigorre would be formally confirmed and that its official designation would be the CPIE of the Pyrenees National Park.

Subsequently, committees which included representatives of the different ministries and local authorities met to define the organisational structures of the CPIE and the statutes of the Association bigourdane pour l'initiation à l'environnement et à la connaissance de la nature (ABIECN) (Bigorre Association for Environmental Initiation and Nature Studies). This body would be responsible for managing the CPIE. The President is the Mayor of Bagnères-de-Bigorre.

The statutes were deposited with the sub-prefecture of Bagnères-de-Bigorre on 18 December 1973 and the CPIE opened to the first trainees on 2 May 1974.

The CPIE is a centre for educational activities and for the discovery of the Pyrenean mountain environment of the national park. It draws its strength from its location in an ideal region richly endowed with natural resources including its flora and fauna which have undergone relatively little change at the hand of man, being a protected area in the national park. Nevertheless, the special characteristics of its human environment and the attractions of its tourist setting are im-

portant. The CPIE is first and foremost a centre for increasing knowledge of the natural environment through the medium of the various disciplines: ecology, biology, geology, pedology and geography. To these disciplines should be added the study of mountain agriculture and of social and economic problems, prehistory, archaeology, history, agrarian and pastoral tradition, folklore and handicrafts. The CPIE forms a link between the educational establishments, the wider public and the areas covered. It has the task of providing training and information with the following specific aims:

a. Promoting an awareness of the importance of the setting in which we live — the natural and human environment — in order to encourage respect for nature, nature conservation and preservation of all it contributes to the value of our regional heritage, our culture and knowledge, our good taste, our skills and our enjoyment of life;

b. Adopting a lively educational approach to the study of the living creatures and the mineral world and to the observation of different factors in the environment and commenting on the events that affect them;

c. Following a whole range of open air activities including mountain rambles, skiing and photography;

d. Contributing to the establishment of an ideal site for conducting observations and research or relaxation, and not simply treating these as an object of curiosity or as surroundings to be exploited or over-run.

The establishment of the CPIE reflects a need and answers two main requirements which are basic and indissociable: survival and the quality of life. The purpose of the activities is to teach people to familiarise themselves with all the valuable elements that contribute to these conditions and to appreciate them and ensure their continuance.

#### 3. Habitats

The mountainous habitats of the central part of the Pyrenees.

#### 4. Organisation, administration and description

The CPIE offers a broad spectrum of activities which are widely varied and designed for adaptation to different situations, especially to the different levels attained by pupils in educational institutions. For school groups these include prepared and guided field activities which enable the trainees to tackle diverse problems, field observations and fieldwork, lectures and audio-visual displays, and exhibitions.

For administration, see organisational chart.

The existing teaching and administrative staff are largely composed of officials from the Ministries of Education and Agriculture. The centre

is open all the year round except for the period between 15 August and 15 September. Eight such facilities exist in France at the moment.

The CPIE runs courses for both schoolchildren and adults undergoing further vocational training, teachers and farmers. It is also used by outside groups interested in the mountain environment, by courses accompanied by their own leaders, and for seminars and conferences. It is open to participants of all kinds including primary and secondary school teachers, group leaders,

school pupils, young farmers, government officials and the public at large.

**5. Finance**

The centre is self-financing as far as its running costs are concerned.

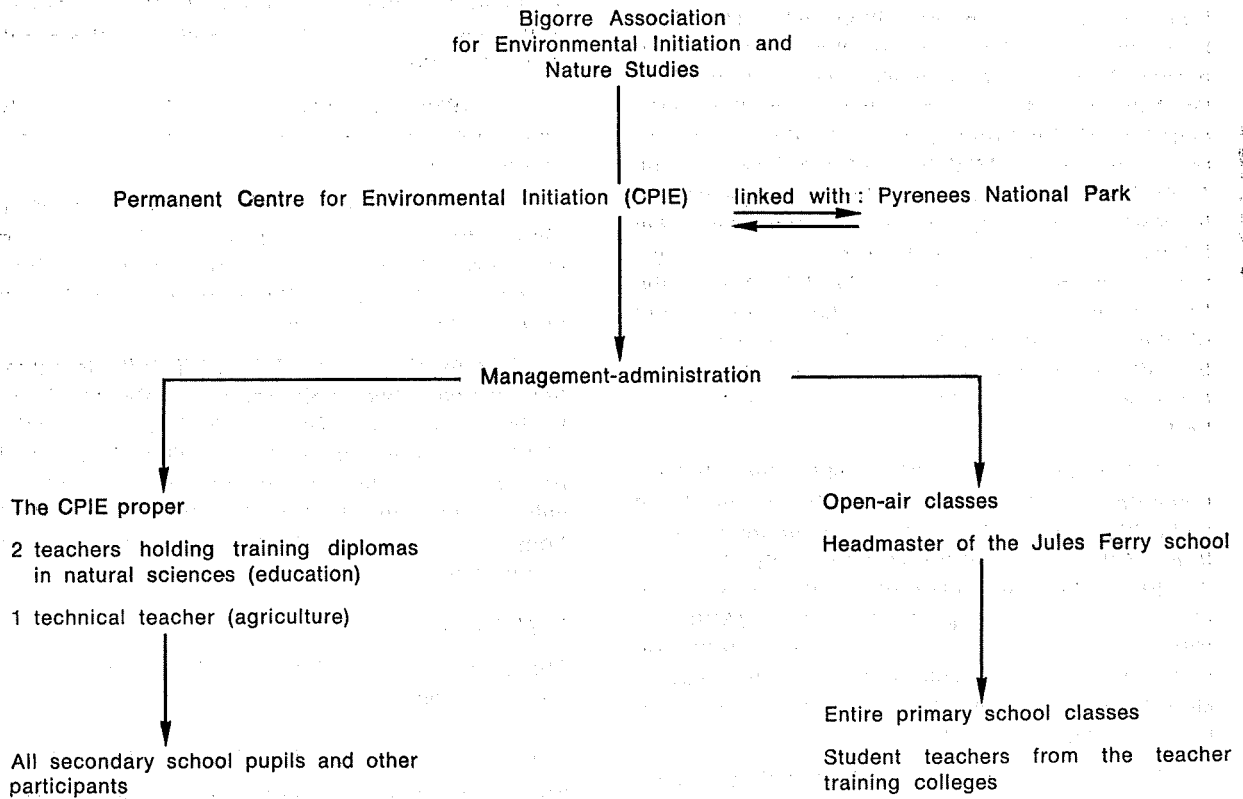
**6. Publications and documentation**

Documents are available in French only.

**7. Address**

Mr Hourdequin, école Jules-Ferry, 65200 Bagnères-de-Bigorre, France.

**Organisation chart**



## Heiliges Meer Biological Centre

### 1. Heiliges Meer, Biologische Station, Hopsten/ Westfalen (Heiliges Meer Biological Centre)

#### 2. History, development and objectives

The Heiliges Meer Nature Reserve was purchased in 1927 as the former country house in the area and was used as an office. In 1961 it was reconstructed as a biological education centre on the initiative of the Museum Director, Dr Franzisket of Munster.

The objective is the communication of biological knowledge as a basis for the aims of nature and landscape management. The emphasis is on the study of ecological and hydro-biological field-work, on the importance of the nature reserve and nature conservation in general, and on special research work concerned with the flora and fauna of the reserve environment. This work has produced 250 scientific publications to date.

#### 3. Habitats

The station is located in the park landscape of the north-west lowlands. The nature reserve has eutrophic, oligotrophic and dystrophic waters, heath landscapes and landslides in an area of gypsum and rock salt deposits.

#### 4. Organisation, administration and description

Normally courses last from four to five days and occasionally there are weekend and day excursions. At times some places are available for individual scientists and undergraduates in addition to visiting groups. The basic course can make use of the lecture room with microscopes for 40 persons and seating for 100, a laboratory with seven places for hydro-biological work, a small library and residential accommodation in youth hostel style for 40 persons. There are also 20 stereo microscopes, wall maps, identification references and books, teaching collections of insects, shells and plants and rowing-boats, plankton nets, soil excavators, and other scientific equipment.

Seventy thousand to 80 000 visitors use the nature reserve each year, and there is a small museum display about the soils and wildlife of the reserve together with an audio-visual programme on this subject.

The administration is by the Westfälisches Landesmuseum für Naturkunde, and finance comes from the Landschaftsverband Westfalen-Lippe. There is a full-time station manager who is concerned with administration and education on the spot.

The station is primarily used by groups of up to 40 persons, and in particular by biology students from the pedagogical academies and universities. It is also used by working groups of senior classes from a gymnasium and by associations of natural scientists. Annual courses are

held by the Westfälischer Naturwissenschaftlicher Verein, Munster. In 1973 attendances totalled 5 456, composed of 2 052 day visitors and 3 404 residential visitors. No charge is made for the use of the station but overnight accommodation costs DM 5.

Usually advanced booking of one to two years is preferable. The courses are either organised by the station manager or by external teaching staff. Course participants are normally over 16 years of age. The centre is open from 1 April to 31 October but because of demand this season has been extended to March and November in some years.

There are some five other centres of this type in the Federal Republic of Germany but this is the largest and most fully equipped.

#### 5. Finance

The educational budget amounts to DM 1 000. In addition consumable items, sewage, electricity, water, and telephone costs amount to DM 20 000. Maintenance of the building and library purchases are financed from the museum budget.

#### 6. Publications and documentation

L. Franzisket, "Die Biologische Station am Heiligen Meer", *Naturkunde in Westfalen*, 5, (3), 86-8, 1969.

H. Ant, "Die Biologische Station Heiliges Meer, bei Hopsten (Westfalen) als Forschungs- und Lehrstätte", *Natur und Landschaft*, 49, (5), 134-8, 1974.

#### 7. Address

Heinz-Otto Rehage, 4534 Recke-Steinbeck, Biologische Station, Heiliges Meer, Federal Republic of Germany.

## Peak National Park

### 1. Peak National Park Study Centre and School Service

#### 2. History, development and objectives

a. Following the preparation of papers by the board's Information Officer between 1963 and 1965 setting out the concept of a national park study centre, a search was made for suitable premises. This ended with the purchase of Losehill Hall, formerly used as a residential centre for school journey parties in outdoor pursuits. The building was converted and modernised and opened for the first course in 1972. It is set in parkland with accommodation for 60 persons in a large new extension.

The purpose of the centre is to aid those who wish to know more about the Peak District as a national park. It aims to instil in all those who come to the centre awareness of the important conservation issues in national parks, with particular reference to the Peak District.



b. The School Service was established in 1967 by the Peak Park Planning Board, which is the administrative authority for the national park (now called the Peak Park Joint Planning Board). The service aims to provide assistance and advice to educational and youth groups visiting the national park. Advice is given on the types of habitat within the national park and on aspects of safety and behaviour for groups of young people under supervision. The work is particularly aimed at educational parties and youth groups, whatever the purpose of their field studies or expeditions. Like the Losehill Centre, the service aims to give groups an understanding of the environment of the national park and its conservation. Plans for new projects include the development of resource material, including film and slide packs, exhibits and publications for schools.

### 3. Habitats

The national park is made up of two main landscapes, the Dark Peak (coarse sandstone known locally as gritstone, with extensive areas of peat moorland at 600 m) and the White Peak (comprising limestone valleys known locally as dales, with village communities, farmland and relicts of ashwood). Both Losehill Hall and the board's headquarters are situated in shale valleys between the White and Dark Peak and are strategically placed from a teaching point of view.

### 4. Organisation, administration and description

a. Facilities for teaching at Losehill comprise a purpose-built versatile teaching area with a range of audio-visual aids, including various types of projector, tape recorder and portable videotape equipment, a large slide library and a photographic darkroom. Courses are open to anyone with an interest in conservation and national parks. Some are run directly by the staff of the centre and some in conjunction with other organisations. The following are some examples:

i. Special seminars on aspects of planning, conservation and interpretation;

ii. General courses — ornithology, natural history, wildflowers, geology, caves, industrial archaeology, canals and railways, landscape painting, historic houses, ancient crafts. This type of course is specifically designed for the general public;

iii. Landscape studies — for university departments, polytechnics and colleges of education. Other courses have been evolved for sixth form geographers and biologists, sometimes combined to give a general course in environmental studies;

iv. Activity holidays — these are courses for family groups who are spending leisure time in the national park. The activities are based on walking, with specialist topics to include aspects of conservation. There is a total of sixteen permanent and three seasonal staff, as follows: four

graduate permanent teaching staff, two graduate seasonal teaching staff, one administrator/bursar, one senior clerk/typist, one assistant bursar, one clerk/typist, one cook/house-keeper, one cook, five full-time domestic assistants, one seasonal domestic assistant, one gardener/handyman.

Residential courses are attended by some 4 000 visitors each year. They are drawn from a wide cross-section of society and range from schoolchildren and students to local government officials and the general public. Organised day visits and conferences attract nearly 3 000 visitors each year. Losehill Hall is open all year and is one of the two National Park Study Centres in Britain, there being a similar centre in Wales.

b. The School Service is run by the Youth Liaison Assistant, working under the direction of a Group Leader for Interpretation and Information. It deals with enquiries concerning all aspects of planning and carrying out educational and field study visits. Talks and illustrated lectures are also given, and information sheets or resource material produced for teachers. The service is available throughout the year.

### 5. Finance

Finance is obtained from visitors fees and a joint Countryside Commission (England and Wales)/Peak Park Joint Planning Board grant for the running of Losehill Hall. Separate financial figures for the National Park School Service are not available.

### 6. Publications and documentation

Programme of courses at Losehill Hall (annual); introductory leaflet, history, development and functions of Losehill Hall; Losehill Hall trail leaflet; national park trail booklet. School Service publications are available on request. A general leaflet on the national park is also available in French, German, Dutch and Italian, but all other publications are in English only.

### 7. Address

The Principal, Peak Park Study Centre, Losehill Hall, Castleton, Derbyshire S30 2WB, United Kingdom.

Youth Liaison Assistant, Peak National Park Office, Aldern House, Baslow Road, Bakewell, Derbyshire DE4 1AE, United Kingdom.

### **Scottish Field Studies Association Centre, Kindrogan**

1. *Scottish Field Studies Association Centre, Kindrogan*

#### 2. *History, development and objectives*

The centre was established in 1963; its objectives are concerned with conservation education. A



wide variety of courses are given on topics including ecological and geographical fieldwork, mountains and moorland ecology, field methodology in botany, geology and geomorphology and ornithology.

### *3. Habitats*

The centre is in the Scottish Highlands.

### *4. Organisation, administration and description*

There are well-equipped laboratories, a lecture room and an attractive library which has acquired a collection of over 1 000 volumes including much local material. The centre's nature trail with explanatory booklet is available to non-residents.

Courses at Kindrogan are available from the first week in March to the first week in November, the normal working week being from Wednesday to Wednesday. Whilst the majority of courses are concerned with field aspects of biology, ecology and geography, there are some on more specialised topics such as insects, birds and mammals, flowering plants, mosses and fungi, geology and glacial landforms, archaeology, photography and painting. In all courses the principles and problems of conservation are considered.

The centre is staffed by three graduate permanent teaching staff plus twenty visiting specialist tutors, one cook-caterer-bursar and assistant domestic staff.

In 1974, courses were attended by 1 570 students; 1 050 came from schools and 298 from universities and colleges, the others being individual adult visitors.

There are plans to expand the research and interpretive facilities. The centre is the only one of its kind in Scotland.

### *5. Finance*

Income is almost exclusively obtained from student fees.

### *6. Publications*

Since 1961 the Scottish Fields Studies Association has produced an annual report which contains scientific papers. These are available in English only.

### *7. Address*

The Warden, Kindrogan Field Centre, Enochdhu, Blairgowrie, Perthshire PH10 7PG, Scotland, United Kingdom.

## **Olafsdalur Environmental Education Centre**

### *1. Menntaskölinn vid Tjörnina Gnodarvogur (Environmental Education Centre, Olafsdalur)*

### *2. History, development and objectives*

The centre was only recently opened (June 1974) and was instigated by the teachers of Menntaskölinn vid Tjörnina. The objectives are concerned with instruction in biology, ecology, geology and chemistry on a site which offers excellent opportunities for varied educational activity.

### *3. Habitats*

Glacial trough opening onto a narrow fiord.

### *4. Organisation, administration and description*

The facility is directed by a special committee composed of teachers and students. Groups of approximately 50 pupils go to the facility accompanied by three to five instructors to stay for one week. Groups of 5 to 15 pupils work together under supervision of instructors according to a prepared plan. Olafsdalur is visited by approximately ten groups each year. The pupils go by bus (250 km journey) and have to pay for this transport and their food. Teaching is done exclusively by the staff of the centre. Parties outside the school interested in using the facility should approach the head of the Olafsdalur Committee. The facility is available all the year round. Olafsdalur is the only facility of its kind in Iceland.

### *5. Finance*

The centre is financed by a special fund with contributions from teachers and pupils; state funds have not yet been obtained.

### *6. Publications and documentation*

Geological survey (report) of Olafsdalur.

### *7. Address*

Agust H. Bjarnason, Hringbraut 41, Reykjavik, Iceland.

## 11. SPECIAL CENTRES



*Iron-age village of the Historical Archaeological Research Centre at Lejre, Denmark.*

### **Definition**

*Special centres:* centres designed for experimental research and demonstration including practical workshops or work schemes, training courses and imitative experiments for environmental education.

Although this group is a miscellaneous category of facilities which contrasts with other types, there are some important points of similarity between the five examples grouped together here. They all emphasise practical schemes of work directly concerned with conservation problems of an educational nature, and they all have a role in the training of teachers, youth leaders or administrators.

### **Variations**

The variations of most importance are those which arise from different objectives. The Lejre Centre (11.1) is concerned with imitative experiments (a special form of simulation of the archaeological or historic past) where the aim is to conduct research which sheds light on the rela-

tionship between man and environment in former times. The results have considerable relevance for people today. Some of this work is conducted on strictly scientific lines but some, with young people, is subjective and gives students insight into the problems of life in a self-sufficient economy. The students act out a simulation of the conditions of life in the past. This requires a considerable period of time and consequently the experimental and training courses have to be residential in order to gain the maximum benefit from the experiments. The Baunatal Centre (11.2) aims to develop techniques of evaluating teaching methods used in environmental education and gives practical demonstrations to teachers as part of its work. Although it appears at first sight to be quite unlike the Lejre Centre, nevertheless the centre works in the related field of socio-economic research, and hence there are some similarities in the overall objectives despite the more obvious differences.

The Zorge Centre (11.3) is concerned with voluntary conservation work schemes for pupils of school age and teachers. It differs from some

centres of this kind in that it gives financial remuneration to the students. Like Lejre it is open to the visiting public.

The Battleby Display and Interpretive Training Centre (11.5) combines some of the objectives of Baunatal and Hollenfels, and also has co-ordinating and central planning roles for environmental interpretation in addition to a wide range of training and research activities.

### Problem issues

An important issue in this category is the problem of "participation" and the type of benefits which accrue from practical schemes of work. Participation enjoys a justifiable vogue at the present time, and although it is present in all our five examples, it is not exclusive to category 11. It is important to understand what we mean by the term in the context of environmental work. We can break down the component elements of participation into two groups of four — the first group comprises those elements of participation which are essential to all category 11 examples:

a. participation in the sense of active rather than passive experiences,

b. tasks where the trainee participates and is able to identify psychologically with the work,

c. participation in the sense of practical work, rather than theory,

d. tasks aimed to change attitudes and give rise to a feeling of responsibility or proprietary feelings about work done in an area.

The second group is not always present in the five examples of category 11 and the stress given to each is often the distinguishing element, reflecting the different objectives which we have just examined:

e. participation, using the senses other than sight (as the word is used in environmental interpretation, e.g. activities such as feeling the texture of an object,

f. participation which gives insight into issues in a way that theory cannot achieve so convincingly (well seen in some imitative experiments concerned with prehistory, e.g. how are stone axes made?),

g. participation which, by virtue of its practical nature, produces a tangible end-product that can be handled, displayed or used to communicate to others,

h. participation which requires group activity or which leads to group management activities. These include Phenix's synnoetic skills, which mean the social skills of inter-personal relations that arise from group work.

Interpretive facilities give some stress to element e above, whilst voluntary conservation work stresses d in the sense of helping, being co-operative, responsive or responsible, but to

some degree there is overlap between the elements.

When a field study group makes a record of the environmental problems of an area, or monitors the educational use of an area, it can present its results as a participation exercise, which, if it is made available to the people living in the area studied, is termed public participation. The production of a film or an exhibition showing local problems, are examples. Planning agencies in the United Kingdom have to make their plans known to local communities who will be affected by the schemes. This often calls for exhibitions of maps and models, lectures and films shown at public meetings. As with all these types the real participation takes place when the public are given the opportunity to take part in discussion and this is equally true of training courses.

### References

*Conservation Corps 1959 to 1969*, British Trust for Conservation Volunteers, 1970.

Hans-Ole Hansen, *The Historical-Archaeological Research Centre, Lejre*, International Study Conference on Environmental Education in a Rural and Urban Setting, Netherlands, Council of Europe, 1975.

### Lejre Historical-Archaeological Research Centre

1. *Historical-Archaeological Research Centre, Lejre*

2. *History, development and objectives*

The centre is a private institution founded on 12 May 1964 by a committee of scientists, politicians and private individuals. Its objectives are concerned with scientific research and education, with particular regard to the cultural history of technology and the evolution of past environments.

3. *Habitats*

The centre is located in a southern Scandinavian moraine landscape of eastern Denmark. It is sited on the old well-preserved estate of forest and farmland at Ledreborg.

4. *Organisation, administration and description*

The centre's landscape is being designed as a special kind of landscape garden to demonstrate past environment and habitat groupings. There is also historical farming and a start has been made on the setting up of a visitor centre, the institution of a nature school and a residential field study centre. Much use is made of existing day centres and camp school facilities.

The staff consists of one administrator acting as a research leader supported by office staff and technical staff (three full-time and four part-time). There are two full-time and seven part-time teachers. There are between twenty-five and

seventy-five part-time information officers, guides, instructors, craftsmen and staff for a ticket office and shop. Research staff are drawn partly from the staff of the centre and partly from outside specialists, often with the help of grants or voluntary agreements from outside bodies. Maintenance work is undertaken by special employees or by outside contracts.

There are some facilities for residential accommodation, camp schools, students, teachers and visiting specialists.

The centre is visited by 600 to 700 camp school pupils for periods of a week at a time each year. Two hundred students attend special instruction courses each year. Four thousand to 5 000 pupils come on one-day excursions for which instruction is provided; 15 000 to 20 000 visiting pupils and students attend visits of two to three hours' duration; 50 000 tourists and family parties come for visits of between one and two hours each year. The majority of visits are between May and October and the emphasis is on visits of short duration. In the winter season there are courses for camp schools and for teachers and students to develop new workshop methods, and work is also done on the documentation of research material.

The centre is reached by train (4.5 km away) by hired bus or by private car. Early booking is essential, especially for camp schools. The centre is almost fully booked two years ahead as regards the camp schools.

The age groups range from 10 years upwards. Visitors from other countries can receive special programmes and guided tours by staff or the research leader if sufficient warning is given. At present priority is for visiting scientists, including archaeologists and anthropologists, school-children, students and teachers.

The centre is the only one of its kind, but has begun to inspire other similar developments in Denmark and elsewhere. New imitative experiments are to be developed in the future. A special audio-visual workshop makes use of a great number of photographs taken during research work. Also an ethnographical workshop, aiming at full scale models of, among other things African material, is being developed.

#### 5. Finance

The work is self sufficient with its resources coming from income raised by entrance fees and grants from the County Councils of Zealand and the Ministry of Education. These sums are respectively, DKr 650 000; DKr 350 000; DKr 300 000 per year. In addition there are special grants of between DKr 50 000 and DKr 100 000 per year (1975-76).

#### 6. Publications and documentation

At the present time stress is laid on documen-

tation of a pedagogical nature and on research work. All publications are in Danish, but some have been translated into English and a few into German. It is intended to raise the number of English language publications as well as the number of interpretive colour slide shows for schools or visitor centres elsewhere.

#### 7. Address

Hans-Ole Hansen, Research Leader, Munkedammen 28, DK-4320 Lejre, Denmark.

### **Baunatal Environmental Education Research Centre**

1. *Umweltschutz Station, Baunatal (Baunatal Environmental Education Research Centre)*

#### 2. History, development and objectives

The station was established in 1972, and is directed by Erhard Rupprecht. It aims to link biological and sociological teaching projects.

#### 3. Habitats

Rural and industrial.

#### 4. Organisation, administration and description

The station is run by one to two part-time teachers, and has two classrooms, one of which is used as a laboratory. It caters for 100 pupils and students each year.

The station is making investigations into socio-ecological studies. It has become clear that environmental education, because of its complex and interdisciplinary nature, should consist of an integration between the natural and social sciences. This integrated approach can most usefully be applied to the teaching in schools. It has also become evident that proper environmental education in schools can change attitudes and behaviour. To this end the research team are developing teaching techniques, teaching units and evaluation techniques. The studies being conducted at present will be pursued with the overall aim of developing teaching units for all schools and for the age groups 10 to 16 years, taking into consideration the curriculum and timetable problems, the type of equipment available in normal schools, and the burden which environmental education can put on the teacher and the structure of teaching. The team does not endeavour to create a new subject of environmental education, but aims to integrate the natural sciences of biology, physics and chemistry with the social sciences of geography, history and political science. The teaching units that are being worked on should enable the teacher to a. discuss complex environmental problems with emphasis on his own subject area with the help of teaching aids and advice on methodology, b. obtain factual knowledge on different environmental problems, c. concentrate more of the teacher's time on discussion with the class and

less on preparation of background material,  
d. experiment with alternative teaching methods including group work and simulation exercises,  
e. ascertain the success of his teaching methods in both the cognitive and affective field by appropriate evaluation techniques.

#### 5. Finance

DM 250 000 from the *Land* Hessen at the beginning in 1972; no further supplies.

#### 6. Publication and documentation

A document is available at Hessisches Institut für Bildungsplanung und Schulentwicklung, D-6200 Wiesbaden, Federal Republic of Germany.

#### 7. Address

Umweltschutz Station, Theodor-Heuss-Schule, D-3501 Baunatal 1, Federal Republic of Germany.

### Zorge Forest Youth Centre

#### 1. Walter Freist Forest Youth Centre, Zorge

#### 2. History, development and objectives

In 1945 voluntary youth groups assisted in reforestation programmes, and in 1948 Forstmeister Walter Freist invited young people to assist in planting work. They were accommodated in huts in primitive conditions. From the outset he was aware of both the forestry and educational values of such work with young people. Teachers were soon attracted by the scheme's importance and as they participated more actively additional accommodation had to be found by converting huts of the former "labour service" to school use. Ten forest centres now exist in the Federal Republic.

The objectives of the centres are to make young people, especially those from cities and industrial areas, familiar with the forest in general and to improve their knowledge of:

a. the forestry and its importance in landscape management and in the national economy, and

b. the ecology of the forest flora and fauna.

#### 3. Habitats

The Walter Freist Centre is situated in the forest area of the Harz on the outskirts of village of Zorge. All the forest centres are located within the larger forest areas, often being many kilometres from the nearest settlement.

#### 4. Organisation, administration and description

Seven of the ten forestry offices have their own centres owned by the Regional Forest Administration, and the others use a rented house, a youth hostel and a log cabin. The forest programmes have also been supported by the Schutzgemeinschaft Deutscher Wald (Society for the Protection of the German Forests).

The individual programmes are two weeks' duration and participants live in the centres and work for five to six hours per day in the forest. The facilities include a lecture room, two teaching rooms, kitchen and six dormitories each for six people. In addition there is a woodwork room.

The centre is administered by the Forest Office of Walkenried and is financed by the forestry administration of Lower Saxony. A District Ranger is in charge of the management and of the young people and is assisted by domestic staff. The forest work is organised in groups under the guidance of experienced forest workers. These forest duties are light but useful and satisfying to young people. Such work includes planting trees, protecting trees from browsing by game, cleaning ditches, feeding game, burning brush and waste and removing litter left by weekend picnickers. At Zorge the students also make nest boxes. Foresters instruct in forest management and ecology, organise educational excursions and make suggestions for leisure pursuits, such as orienteering.

The ten centres are visited annually by between 4 000 and 5 000 pupils drawn from 120 to 130 schools. The minimum age is normally 14 years. Applications are made through the Schutzgemeinschaft Deutscher Wald in the autumn before the visit, and the organisation acts as a clearing-house. The teacher contacts the centre assigned to the class and receives information materials for preparation in biology and geography. The demand exceeds the number of places available; there is a need to establish more such centres. These centres are open from March to November. Youth forest programmes take place in North Rhine-Westphalia, Bavaria, Baden-Württemberg, Hesse, Schleswig-Holstein and Berlin, in addition to Zorge in Lower Saxony.

#### 5. Finance

Board and lodging at the centre is provided free, and participants pay only their travel costs and the cost of any special visits. The forest administration bears the cost of staffing and running expenses. It also pays each participant DM 10 per day for their work in the forest.

#### 6. Publications and documentation

*Schulen im Jugendwaldheim. Eine Hilfe zur Vorbereitung und Durchführung von Jugendwaldeinsätzen* (schools in the forest youth centre: an aid for the preparation and organisation of youth forest programmes), leaflet published by Landesverband Niedersachsen der Schutzgemeinschaft Deutscher Wald, second edition, Hanover, 1975. Articles in *Unser Wald*.

#### 7. Address

Oberforstmeister von Lewinski, Forstamt Walkenried, 3452 Walkenried, Am Eckfleck 37, Federal Republic of Germany (telephone: 05525-334).

General enquiries about forest youth centres in Lower Saxony to Schutzgemeinschaft Deutscher Wald, Landesverband Niedersachsen, 3 Hanover, Aegidientorplatz 4, Federal Republic of Germany (telephone: 0511-14983).

### **Hollenfels Youth Training Centre**

#### *1. Hollenfels Youth Training Centre*

#### *2. History, development and objectives*

Some years ago the facilities at this castle were extended to include educational work and to develop it as an open air and field centre. Field study classes and training courses in environmental education are organised; the main objective is to introduce young people and adults engaged in educational work to nature conservation and environmental protection.

#### *3. Habitats*

Various, especially forests.

#### *4. Organisation, administration and description*

The centre is supervised by a committee composed of representatives of the four bodies which created this centre, i.e. Service national de la jeunesse, Administration des eaux et forêts, Ligue pour la protection de la nature et de l'environnement and the Centrale des auberges de jeunesse. An advisory committee of teachers works out the programme of the centre and cares for its animation.

The station is run by an administrator and a part-time biology teacher who will be seconded in the near future by a team of teachers.

The centre can provide lodging facilities for about 80 people. There are two classrooms, a laboratory and a library, and in the old fortress tower four large rooms are available for different purposes such as conferences, exhibitions, leisure activities etc. A large park offers various sports activities. There is also a nature trail.

#### *5. Finance*

Partly self-supporting, subsidised by the Ministry of Education. The staff of the centre is paid by the state.

#### *6. Publication and documentation*

Bulletin of the Service national de la jeunesse about youth activities, posters and booklets about protected plants and animals, description of the nature trail.

#### *7. Address*

Service national de la jeunesse, 20, avenue Marie-Thérèse, Luxembourg (for all correspondence).

Youth Training Centre, Hollenfels (Castle), Luxembourg.

### **Battleby Display and Interpretation Centre**

#### *1. Battleby Display and Interpretation Centre*

#### *2. History, development and objectives*

The centre was established in May 1974 by the Countryside Commission for Scotland at its headquarters at Battleby. In the commission's first full year of operation in 1969 it undertook to co-ordinate Scotland's contribution to European Conservation Year. During this period of preparation the commission helped to review national needs and contributed to the formulation of national policies in relation to design standards, interpretation, education and training in the Scottish countryside. The need for the centre arose from the formulation of the commission's contribution to solving pressing problems in countryside management, and the following objectives relating to the work of the commission and the centre were determined:

a. to provide a wide range of technical advice in recreational, interpretive and educational planning through the development of the centre, which should display equipment and give practical demonstrations of techniques to promote high standards of design;

b. to further a programme of interpretive planning at regional and local levels and to encourage developments in the planning of facilities for environmental education and the better use of the countryside by teachers and schools;

c. to extend public awareness, appreciation and understanding of the countryside through a programme of relevant publications, conferences, and educational resources, including films and other audio-visual media;

d. to run training courses which should have a multiplier effect for countryside interpreters and rangers, interpretive planners, voluntary conservation work leaders, teachers and educationists, and managers of informal countryside recreational facilities;

e. to develop and manage a programme of research relevant to the commission's objectives, including the monitoring of sites where products are displayed or new techniques and methods demonstrated.

#### *3. Habitats*

The centre is situated in 15 ha of land owned by the commission consisting of policy woodlands, including a fine arboretum, and grazing land. The location is near the boundary fault where the Scottish Highlands meet the Lowlands; consequently it is within easy reach of a wide range of habitats.

#### *4. Organisation administration and description*

The centre has two major functional elements — the first is the Countryside Display Centre, headed by an Assistant Director (Research and Develop-

ment) with a display centre staff of three: the Display Centre Manager, his technical assistant and a secretary-receptionist. It has an outdoor display section where different types of equipment and construction methods are displayed in the grounds, and an office with workshops and reception area where enquiries are answered and information sheets, design specifications, and details of costs are produced.

The second element is the Interpretive Planning and Training Centre headed by an Assistant Director (Conservation Education) with a staff of seven: interpretive planner, educational resources development officer, media advisory officer, graphic designer, senior education officer, education officer and a secretary. The training centre consists of a main auditorium which can seat 150 conference delegates, and is fitted with multi-screen audio-visual and public address facilities.

There are exhibition foyers and seminar rooms together with a design studio and projection room having a console unit. For residential courses accommodation is available in local hotels.

Training courses vary from one-day seminars for professional, managerial and student groups to twelve weeks for main-grade ranger courses. The interpretive planning courses last seven days and are held in conjunction with the Scottish

Field Studies Association at both Kindrogan (see 10.6) and Battleby. The centre is open all the year round but is not open to the general public except when it is used for the local Festival of the Arts.

#### *5. Finance*

Course participants attending residential courses pay for their own accommodation, food and transportation. Generally no charge is made for tuition provided by commission training staff if course members are working in Scotland. Charges are made for attendances at one-day seminars and conferences to cover costs. The commission receives its finance in the form of grant-aid from the Secretary of State for Scotland.

#### *6. Publications and documentation*

The commission publish a wide range of publications: leaflets for the general public, technical reports, annual reports and booklets on the commission's work, a guide to interpretive facilities in Scotland, and three free leaflets on the centre itself; "Display Centre", "Training", "Conference Facilities".

#### *7. Address*

Director, Countryside Commission for Scotland, Battleby, Redgorton, Perth, Scotland, United Kingdom (telephone: 0738-27921).



## 12. ENVIRONMENTAL EDUCATION AND INTERPRETATION TRAILS



*Specially prepared nature trail using information facilities to focus on natural features.*

Photograph: Carrbridge, Inverness, Scotland.



*Pupils discover nature and the relations between plants, animals and man along a nature trail.*

Photograph: School and Children's Garden Service, The Hague.

### Definition

*Interpretive and environmental education trails:* guided or self-guided routes programmed through urban or rural areas or facilities with predetermined observation stations or viewpoints which give opportunities for first-hand study of inter-relationships in the environment or which stimulate awareness of site significance.

There is probably no area of environmental education and interpretation which has been the subject of more advisory notes and publications than this question of trails. Much of the advice given can be divided into two main elements: the mechanics of how to produce trails and trail guides, and the objectives and contents of these guided facilities. Reading the literature one gains an immediate impression that many of the most obvious characteristics of these facilities do not seem to be understood. This is probably because interpretive trails have been imported from the United States without a proper understanding of the American archetype. For example, trail design and trail interpretation in Europe almost invariably take the form of a programmed route which follows a footpath. To take an existing footpath advantage; rangers can identify animals seen on

the United States National Park Service designs interpretive trails. First an area is surveyed as part of an interpretive planning process, and part of the area is then designated for the design of an interpretive trail, in just the same way as the planner decides to allocate a particular part of a story to a specific medium in a visitor centre. The area is chosen because it contains the necessary field evidence with which to put over a message allocated to that chosen facility. Choice of route will therefore depend on how the planner can most conveniently link up the stopping points or stations, without causing unacceptable disturbance to the resource or danger to the visitor. The chances of achieving these objections on an existing footpath, with stations well placed, length of trail appropriate to the visitor, hazards kept to a minimum, the story followed in the most logical order, and the whole theme related to interpretation of the entire scene, are practically nil.

The considerations of a more mechanical nature which are taken into account in planning guided trails are as follows:

a. Method of travel. There is almost no limit to the possibilities: a short walk intended for family groups or for young children; longer walks



taking in extensive areas of countryside; horse-back rides; bicycle rides; vehicular transport rides both ancient and modern (e.g. buggy, coach, tram, car, train) ; water travel by boats of all kinds from rowing boats to ocean liners; air travel by helicopters or planes; underwater routes by sub-aqua methods or boats with glass bottoms. No doubt there are others!

b. The starting point. The planner provides an assembly point where personal transport can be left by the visitor, an interpretive medium collected or purchased or a meeting with a ranger effected. There may be a need for briefing or debriefing at this point. The place must be accessible and the trail must obviously not enter private property without permission;

c. Length, shape, route of trail. Most advice given under this heading assumes that trails are perambulations on foot. The most effective interpretive trails are brief (not more than thirty minutes) and short (under 2 km). But if the trail uses some other method of travel, this advice will obviously not apply, though the principle of brevity is perhaps worth establishing. For the same reasons, it is difficult to pontificate about the shape of a trail, even when visitors have to leave their cars at a point and return to them on completion of the trail. The shape should depend on the message, the content, the story line sequence and on the avoidance of hazards and fatigue, the ease of navigation, and the provision of shelter and resource management consideration. Whether the trail is I-shaped or in an O, U, S, W, E or any other shape is scarcely as important!

Trails can have alternative loops for special purposes or specialised groups and they can also be opened on a restrictive basis in which case they are sometimes called "open days";

d. Number of stations. Again, this is a matter mainly concerned with the nature of the trail and its objectives rather than other management issues. If there is a golden rule, it is perhaps that wherever possible the stations should be inter-visible in order to keep interest alive. They should obviously be located where the interpreter has found a place at which the next logical point in the story should be made. This approach, though very obvious, is rarely taken because footpaths designed for another purpose rarely lend themselves to good interpretation and consequently the results are frequently dull and illogical;

e. Means of interpretation. Personal guiding and self-guiding of trails are not forms of interpretive media, though they may employ such media. The ranger or personal guide has certain advantages and disadvantages compared with the self-guided technique. Leaving aside the quality of the ranger's performance, the advantages are that: questions can be posed and answered; use can be made of questions or of ephemeral occurrences on the trail and put to advantage; rangers can identify animals seen on

the trail and ensure that specific points in the landscape are correctly identified in the field of vision; changes in the trail route or landuse changes and seasonal changes can be accommodated by the personal guide; and the ranger can also interpret at a level most appropriate to the visitors, be they general or specialist, physically fit or handicapped. What the ranger cannot do is to take the trail at a speed appropriate to every member of the group, for he has to move at the physical and mental speed of the slowest.

The other side of this particular coin is seen when we look at self-guided trails. These employ one of the following interpretive media: audio methods (portable sound guides, listening posts, radio receivers), booklets or cards, signs, wayside exhibits and even trailside site museums or visitor centres to house three-dimensional exhibits or audio-visual programmes. The advantages of the ranger become the disadvantages of a self-guided trail and vice versa. It is seldom possible to make a case for either trailside museums or visitor centres just because there is an interpretive trail. This is because the three-dimensional evidence of a site museum is best seen out of doors and the two-dimensional photographic images of a visitor centre are best printed in a trail guide, so they can be seen at the most appropriate place.

f. Environmental education use of trails. Where educational use is envisaged, as opposed to environmental interpretation, different criteria have to be applied. To a teacher, a trail which is available for school use may seem an attractive proposition. It provides guaranteed access to the area, it has been researched by specialists which obviates the need for preparation of the subject or the route, it makes observations for both teachers and pupils, it often allows samples to be taken *en route*, and it may even be designed for a particular age group and relate to a particular curriculum, thereby using the concepts and the level of vocabulary most appropriate to the students. The sad thing is that some of these so-called advantages can be obstacles to good teaching.

The main advantage of a good trail in this context is that it has been prepared from an inventory of the area over which the visitor or student will pass. What the environmental education trail designer requires is not the finished trail notes but this essential raw material — the base maps and the research survey results. From these the teacher can programme his own learning situation for the students. If we accept that the field experience of a student will be based on discovery methods, then it is more difficult to see much advantage in using an existing trail. It might be argued that it guarantees access, but technically this should not be assumed, for using a trail for anything other than following a route may technically be a form of trespass in some countries. Nor does it follow that because trails are effective forms of interpretation for family

parties, children should therefore use them or design their own trails.

What we are really discussing here is the nature of fieldwork in town and countryside and whether that fieldwork takes the form of a programmed linear route with observation stations or whether the fieldwork is entirely static! Looked at in this way, one can assume that even the most stationary biological quadrat survey might be termed a mini-environmental education trail from this standpoint. The main point at issue is whether the observation points or stations are selected by the programme designer or by the student, and if the latter appears to be true whether it is really a "discovery" experience. It is possible, for example, for a student to choose an observation point at random, in an area which has been pre-selected by the programme designer or teacher, and make "discoveries". We are of course touching very lightly here on the whole question of how much discovery is involved in our discovery methods. One thing is certain: the theory concerning the relationship between educational trails, transects, quadrats, observation points, viewpoint indicators or overlooks etc. is not as simple as some writers would have us believe.

This brings us to the main issue: the important problems concerning objectives and choice of subject matter. In the introductory section we defined environmental education and interpretation, and comparing these two definitions we can now draw certain conclusions about environmental education and environmental interpretation trails.

In environmental education we have the advantage of groups prepared for visits with the objective of developing skills and attitudes needed to understand what they have come to see. We could therefore devise trails to develop skills of the symbolic type (e.g. identification trails, sketching trails etc.), the empirical type (posing hypothesis and using elementary scientific methods to test them in the field), or the aesthetic perception type (sensory experiences of sight, sound, scent and touch). We could make trails into a completely programmed experience or into an heuristic experience, subject only to certain rules with regards to trespass and damage. We could also use trails to collect data for studies of inter-relationships.

Interpretive trails, on the other hand, attempt to achieve their objectives with the casual visitor on the trail. They should trace inter-relationships in order to demonstrate the significance of the site being visited and they should also have a conservation message which is relevant to that site. To do this in a comparatively short time is usually effected by a thematic treatment, simply because a story sequence is more logical and memorable than any other, although it isn't essential. The site should be scrutinised from a multi-disciplinary approach in order to shed light on

the meaning of what is seen and to raise questions about conservation, or planning, or social issues as well as bio-physical matters.

Interpretive trails are better not conceived in terms of "nature" trails and "history" trails, for subject discipline trails of this type are too specialised to achieve the necessary degree of awareness. However, specialist loops may be employed as subsidiary parts of the whole experience; for example, an ecological approach on one loop and an ethnological approach on another.

Finally, it is often suggested that the best interpretive trails followed on foot should include an element of what is termed "participation". This is sometimes taken to mean using questions to involve the visitor in some form of mental activity as opposed to observation, and it implies that observation is a passive activity. It is more usually taken to mean inviting the visitor to use his senses other than sight (listening for bird calls, smelling the flowers, touching the surface of a leaf). Such techniques are valuable if they are relevant to the sensory perception of the feature being observed.

In conclusion then it would seem that environmental interpretation trails should aim to put over a message to the general public about the significance of a site, increase awareness of its importance and the need to conserve it. Environmental education trails (which are another way of describing a type of programmed field work) have the objectives of introducing skills and understanding in symbolic, empirical and aesthetic perception. If they go much beyond this they are unlikely to be programmed in the same way or are likely to take place in the classroom, workshop or laboratory.

#### References

- Nature Conservancy, *Nature Trails*, 1968.  
E. V. Wray, "Nature Trails as a Teaching Aid", *Journal of Biological Education*, 1968.  
R. W. Colton and R. J. Morgan, *Project Environment: Learning from Trails*, Schools Council, 1973.  
P. G. Carter, "Urban Nature Trails: Pupils and Parks", *Your Environment*, 1974.  
B. Goodey, *Urban Walks and Town Trails: Origins, Principles and Sources*, University of Birmingham Research Memorandum No. 40, Centre for Regional Studies, 1975.  
Bulletin of Environmental Education, *Urban Trails*, spring 1975.  
J. Benyon, "Escapism in the Countryside Farm Trails", *County Gazette*, 67, 1975.

#### Irish Nature Trails

1. *Self Guided Nature Trails in National Parks in Ireland*

2. *History, development and objectives*

The first nature trail operated by the National Parks and Monuments Branch of the Office of

Public Works was opened in 1970. The objectives are the interpretation of nature for the general public and environmental education for schools. Trails are considered by the organisers to achieve the aims with maximum effectiveness and minimal demands on skilled personnel.

### 3. Habitats

Four of the trails are in a national park, one is in a park in a rural coastal area, and one is in an urban park.

### 4. Organisation, administration and description

The trails function as part of the services provided to the public by the staff of the park in which they are situated. Access to all trails is free at present, but a small charge is made for leaflets at most trails. Six trails have been provided by the branch but others have been provided by other authorities. There are plans to provide further trails in existing and newly acquired national parks and other parks. Apart from nature trails there are no formal arrangements for educational use of national or other state parks at present. However, the provision of nature interpretation visitor centres, general and specialised guidebooks and leaflets, and other educational and interpretive facilities and aids is being planned. The potential of the parks for field studies has been examined in co-operation with the Department of Education, and it is possible that field study centres will be opened in, or in association with, certain parks in the future. The existing trails are available all the year, although some may be subject to flooding in winter.

### 5. Finance

Finance by the state is part of the programme of the Office of Public Works.

### 6. Publications and documentation

Descriptive leaflets for each trail are available in English.

### 7. Address

Mr James O'Halloran, Director, National Parks and Monuments Branch, Office of Public Works, 51 St Stephens Green, Dublin 2, Ireland.

### Horniman Museum Trails

1. *Horniman Nature Trails, Horniman Gardens, London*

#### 2. History, development and objectives

The trails were inaugurated in October 1970 at a joint meeting of representatives of the Inner London Education Authority and the Greater London Council Parks Department. The decision-making authority is the Greater London Council Parks Department. The objective of the trails is to

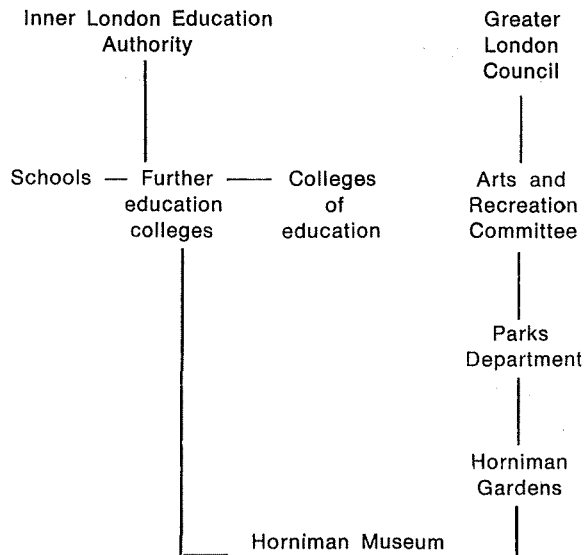
increase the educational use and appreciation of parks and open spaces.

### 3. Habitats

Urban.

### 4. Organisation, administration and description

The organisation chart is as follows:



The Advisory Committee consists of interested members of schools, museum and park staff. There are six major activities: a. nature trails — coach house, Dutch barn, and railway for the general public and schools, b. an animal enclosure for the general public and schools, c. a project area for primary schools work, d. an ecology area for secondary schools, colleges of education and further education work, e. teachers' courses on the use of nature trails, f. a local nature trails course.

Some fifty teachers bring pupils at intervals throughout the year. Services, when provided, are free of charge, but the trails are intended to be self guided. No transportation is provided. Teachers are advised to inform the museum's education centre of impending visits to avoid overcrowding on the trails in spring and summer. Specialists in particular topics have been brought in to talk to teachers and senior students. The age range is from 4 to 80 years

The coach house and Dutch barn trails use the formal paths within the park. The railway trail is on a disused railway line which has been closed for twenty years and is now overgrown. All three are self-guided trails, with numbered teaching stages and seasonal guides.

The emphasis of the teaching is on biological work with a multidisciplinary approach. The trails are used all the year round, and are examples of many such facilities established in the UK. Future developments are expected to include wet weather trails within the museum and project cards for individual/group work.

### 5. Finance

No particular sums of money are allocated to nature trails but any expenses are met from normal maintenance budgets.

### 6. Publications and documentation

Horniman Nature Trails Pack No. 1: Coach House and Dutch Barn Trails, £1.20; Horniman Nature Trails Pack No. 2: Railway Trail and Animal Enclosure, £1.50; Birds, Plants and Mini-Beasts

(identification charts from Packs 1 and 2) 90p. The publications are in English only.

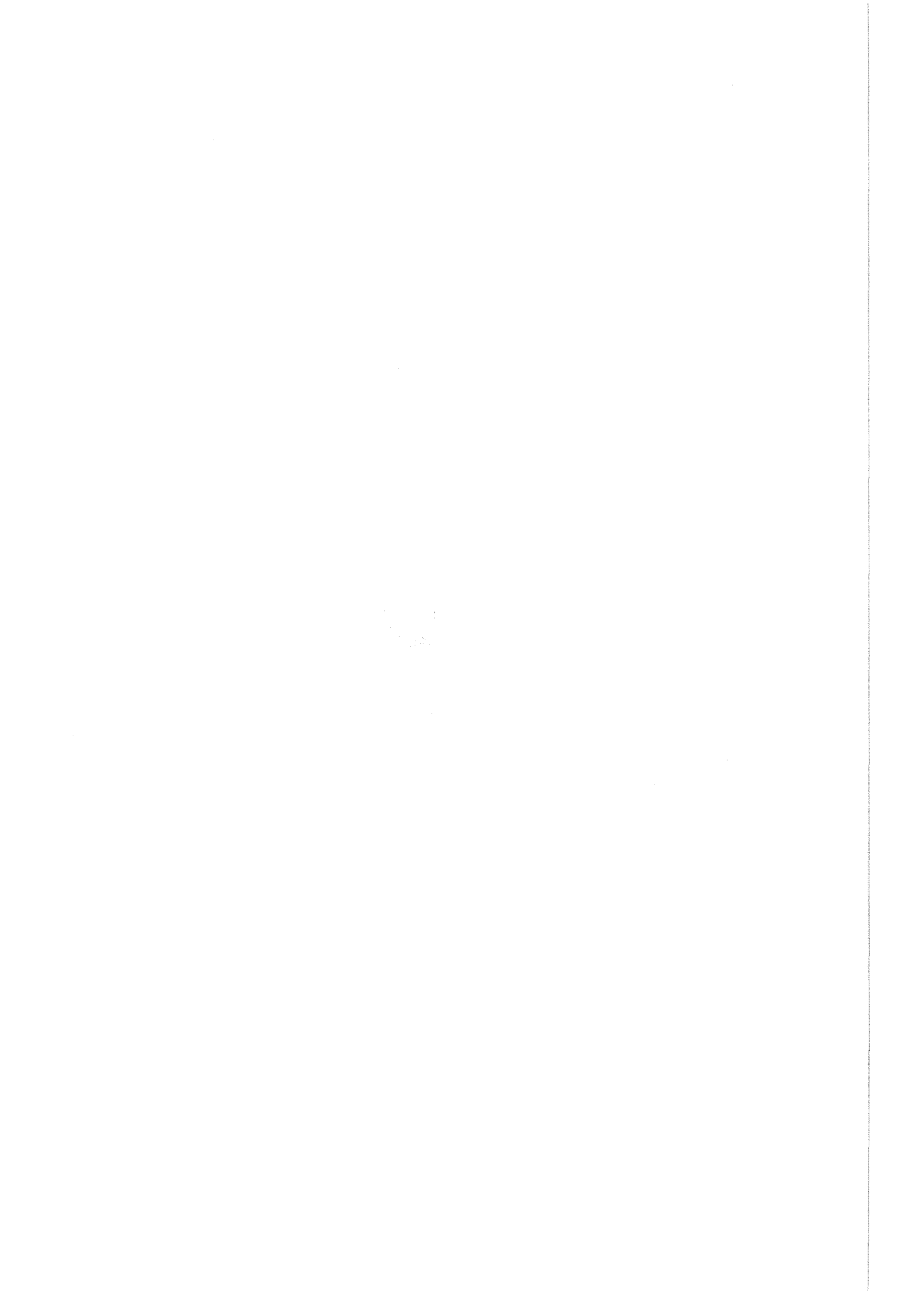
### 7. Address

James C. Kennedy Esq., Chief Officer of the Parks Department, PK/M4C, Greater London Council, 233 High Holborn, London WC1V 7DN, United Kingdom.

Dr Elizabeth Goodhew, Chairman, Advisory Committee for the Horniman Nature Trails, Horniman Museum, London Road, London SE23 3PQ, United Kingdom.

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