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Permanent Commission on Conservation Education

W O R L D C O N S E R V A T I O N E D U C A T I O N

Papers Presented at the Workshop
of Conservation Education;
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TABLE OF CONTENTS

			Page
1.	Introduction	L.K. Shaposhnikov	1
2.	The Role of Nature Conservation	J.-G. Baer	2
3.	Scientific Aspects of Nature Conservation ..	E.H. Graham	6
4.	International Siginificance of National Parks in Conservation Education Part 1 ..	H.J. Coolidge	11
	Part 2 ..	J.-P. Harroy	15
	Part 3 ..	W.J. Hart	20
5.	Problems of Protection of Rare Species	C.L. Boyle	23
6.	Conservation of Fauna	G.P. Dementiev	25
7.	Conservation Education in the United States	R.L. Weaver	30
8.	Experience in Conservation Education and Propaganda of Nature Conservation in the U.S.S.R. and Countries of Eastern Europe	L.K. Shaposhnikov	41
9.	Experience in Conservation Education and Nature Conservation Propaganda in the Countries of Western Europe	J. Goudswaard	49
10.	Experiences and Objectives in Conservation Education and Propaganda in Countries of Africa	M.K. Shawki	58
11.	Ecology Field School, Washoe Pines Ranch, Nevada, 1963	R.G. Miller	61
12.	The Role of National Parks and Reserves in Conservation Education and Propaganda of Ideas of Nature Conservation in the Countries of Africa	W.H. Eddy	65
13.	Resume of Workshop on Conservation Education Papers	J. Pile	66
14.	Discussions	J. Goudswaard	71

I N T R O D U C T I O N

by
L. K. Shaposhnikov
Chairman
I,U.C.N. Commission on
Conservation Education

It is the aim of nature conservation to utilize natural resources harmoniously, so that they are in keeping with man's growing material and cultural requirements. This is why all countries and peoples are vitally concerned with the development of nature conservation.

The mounting world-wide interest in the problem has been noted by the United Nations Organization, which adopted an important resolution on economic development relating to nature conservation at its 17th General Assembly in 1962. UNESCO, FAO and other international organizations, not to mention IUCN, are devoting increasing attention to the problems of nature conservation.

It is very difficult, however, to promote nature conservation projects. Success in this matter depends largely on efforts to educate the public, to make it understand what nature means to man; and on what is done to teach people to utilize natural resources wisely and carefully.

With these aims in view, the Conservation Education Commission of the IUCN, aided by the IUCN Executive Board, decided to hold the present workshop sessions on education and nature conservation propaganda for specialists in African countries.

The sessions which were attended by more than 80 people of 35 countries, took place in Nairobi on September 12th and 13th 1963, in connection with the 8th General Assembly of the IUCN.

The papers read at the meetings stressed the manifold significance of nature conservation for mankind, outlined the problems, and indicated the methods used in various countries to popularize the subject.

The participants at the workshop sessions had an opportunity to expand their horizons, and to learn about new developments from the experience gained by nature conservation education bodies throughout the world.

I hope that this publication, which contains the papers presented at the Nairobi workshop sessions will help teachers and all those connected with conservation education to improve the organization and implementation of activities to popularize the idea of nature conservation at educational establishments particularly and among the broadest possible section of the population generally.

L. K. Shaposhnikov

LKS:Id'AA

The Role of Nature Conservation

Some International Aspects of the Problems and Activities of I.U.C.N. and other Organizations with Similar Aims

by
J. G. Baer
President of I.U.C.N.

Three years ago in Cracow, Poland, the General Assembly agreed unanimously to launch the African Special Project which aims to save the remaining wildlife of Africa, an important natural resource, and to integrate it into the economy of modern African states. The Arusha Conference representing the second stage of this project has already made history and one of the immediate results has been the worldwide diffusion of the Arusha Manifesto drawn up by the Prime Minister of Tanganyika and his colleagues. It is therefore particularly appropriate that, as the end of the third stage of the African Special Project looms ahead, the General Assembly of IUCN has been convened in Kenya, a country which still enjoys a great variety of wildlife thanks to its National and local Parks and which together with many other African states has supported the Arusha Manifesto for which I wish to cite in extenso the closing paragraph since it is so closely linked with the policy of IUCN on this Continent : "The conservation of wildlife and wild places calls for specialist knowledge, trained man-power and money and we look to other nations to cooperate in this important task - the success or failure of which not only affects the Continent of Africa but the rest of the world as well."

It is most encouraging to find that conservation of wildlife and wild places is considered for the first time in a pan-african perspective and that the solidarity of the African Continent with the rest of the world is also recognized. Have not all the African states a common natural heritage for which they are responsible both to their own peoples and to humanity as a whole, as stated in the preamble to the African Charter for the Protection and Conservation of Nature adopted recently by the 18th Session of CCTA at Dar-es-Salaam ?

International solidarity as we interpret it must encompass but go beyond the moral attitude that looks upon the African fauna and flora for its esthetic value and the attitude of the scientist interested in preserving for future reference and research outstanding examples of wildlife and habitat. For IUCN is fully aware that international co-operation must also include the conservation of mankind and the betterment of human welfare. Man cannot be divorced from nature even though as his numbers multiplied he has shamelessly mishandled her in the mistaken belief that his higher intelligence will finally allow him to sever the remaining links so as to leave him completely free.

Within less than 200 miles from here, in between two of East Africa's most extraordinary National Parks, lies the river bed where man lived over one million years ago. In selecting for the guiding theme

of the ninth Technical Meeting "The Impact of Man on the tropical Environment", IUCN has envisaged the three principal phases of the biological history of mankind that can be summarized by the words past, present and future or, as a biologist would see it : man in balance with his environment, man the destroyer of his environment and man aware of his inability to survive outside his environment.

Pre-industrial man practically never passed beyond the first stage as it is still even today among certain primitive tribes both in the Old and the New worlds. But as higher forms of culture evolved they caused more extensive and more durable encroachments upon the environment so that unwittingly man started an irreversible process that has, especially in the past, caused entire civilisations to be wiped out, when the habitat became unfit for human survival. Such man-made scars that are found in nearly all parts of the Earth will never be healed completely because of the far-reaching consequences that followed their making, but now that we have learned from comparative ecological studies how they originated, we also know in which their appearance may be prevented by wise land use and rational management of natural resources.

Modern man is the only species to have created its own habitat, adapted to its needs and, except for certain insects, the only species to have succeeded in concentrating great numbers of individuals in a very small area. But the habitat so created is artificial from an ecological standpoint and man's survival in such exceptional concentrations must obviously depend on the production of the very large amounts of food necessary for his sustenance. In fact man has acquired an entirely artificial form of ecology without always being aware that he still remains dependent on natural resources, climate, soil, water and air, even though all these factors are deeply influenced by his activities in one form or another.

Aristotle distinguished man by his higher intelligence and, subsequently, Linnaeus named him Homo sapiens. Yet intelligence is unable to evolve from within alone, when not provided with a suitable environment in which it can be exercised. It is his intelligence that enabled pre-industrial man to survive on a regional level, but as his numbers multiplied and mankind spread throughout the world acquiring different social structures, man became less dependant on his immediate environment. His capacity for adapting himself to almost every type of ecological niche enabled him to multiply beyond the rate of any other species of animal. Famine, disease and wars have taken their toll, but they have slowed down only temporarily the ever increasing population pressure. It is not yet too late to take action, nor too late to make man aware that conservation does not only imply wise land use for crop production but also the setting aside of recreational areas of particular beauty or scientific interest for his enjoyment and education. National Parks established throughout the world have been recognised by the United Nations Organization as of particular importance and interest, a form of recognition that was constantly apparent during the First World Conference on National Parks in Seattle last year, sponsored by IUCN and the U.S. National Parks Service together with UNESCO and FAO. It was encouraging to all to see among the sixty-two countries represented, delegates from twenty-five African states.

At the end of last year, the General Conference of UNESCO adopted a Resolution calling upon the Director General and upon the competent international organizations to give their fullest support and to provide technical assistance to the developing countries in the conservation of their natural resources, including flora and fauna. The General Conference was of the opinion in particular that to be effective, measures to preserve natural resources, flora and fauna, should be taken at the earliest possible moment simultaneously with economic development, including industrialization and urbanization.

This important Resolution calling upon all member countries to support IUCN was later endorsed by the General Assembly of the United Nations at its 17th Session in December 1962. The latter calls upon the Secretary-General, the specialised agencies and other interested international and national organizations in support of the above-mentioned UNESCO resolution, to continue to give their fullest co-operation and provide technical assistance to the developing countries at their request in the conservation and restoration of their natural resources and flora and fauna.

That IUCN is specifically recognized by the foremost world organization is a tribute to its activities, but it also implies greater responsibilities that we are willing to assume provided we are given the fullest cooperation and financial support by our members and donors. Among the latter we have to be particularly grateful to the World Wildlife Fund under the leadership of H.R.H. Prince Bernhard of the Netherlands, that has enabled IUCN to undertake important tasks that would otherwise have had to be neglected.

Among international organizations recognised by the United Nations special Agencies, IUCN enjoys complete independence of all forms of political influence, and its activities are therefore directed by men chosen for their scientific standing, outstanding contributions to conservation and a willingness to cooperate regardless of other considerations.

It is therefore most regrettable that for extraneous reasons these meetings have been deprived of the presence and experience of several participants among whom is a member of the Executive Board who over the past six years has given constant and ample proof of his support to conservation on a worldwide scale. The National Parks Board of South Africa represents one of the pioneer organizations that more than any other has opened new roads and introduced new methods that are today the scientific basis for conservation in Africa. In scientific circles any form of discrimination is contrary to the true spirit of international cooperation, especially when it applies to those who have proved through their activities that they can contribute most to the problems of conservation in the form of technical assistance to developing countries and thus help them to attain a higher standard of living.

IUCN has been recognised as technical adviser to the Committee of Experts for the Conservation of Nature and Landscape established last year by the Council of Europe. We are consulted regularly and are

invited to send observers to its meetings, but we cannot become members of the Committee, because of our strictly non-political structure. We have the advantage, however, of being in the position to act as a means of contact with solutions of conservation problems adopted in countries outside the Council of Europe, thus contributing towards a broader concept of conservation throughout the whole of Europe. Moreover, IUCN's active interest in Europe has also been underlined by the Conference on Conservation and Protection of temperature Marshes and Wetlands which was held in the Camargue, France, in November last year.

In collaboration with other international Agencies, IUCN proposes to plan further projects, along the lines that have led to the success of the African Special Project, in other parts of the world. It is however undesirable to undertake too many tasks at the same time; an order of urgency will have to be established and the projects initiated on the basis that IUCN acts as catalyser, furnishes consultants and evaluates the field of research, but allows other better equipped agencies to assume the administrative and financial problems of such enterprises.

J.-G. Baer

JGB:Id'AA

Scientific Aspects of Nature Conservation

by
Edward H. Graham
Chairman,
I.U.C.N. Commission on Ecology.

Summary

Nature conservation can be most rational when it is based on the results of scientific research. This is true if we are to possess any basic understanding of nature, especially the dynamic processes which are characteristic of the world's complexes of living organisms, either terrestrial or aquatic. Our knowledge of these processes largely determines our concept of nature and our philosophy of conservation.

It is equally important that we understand enough of the nature of such complexes, or ecosystems, (geobiocenoses), that we can properly evaluate the intensity of biological activity inherent in them, and assign to them some approximate order of their biological productivity. Evaluation of biological productivity may be of considerable value in the use and management of natural resources, and as guides to land use, both in the new nations and in the more developed countries.

Resume

La conservation de la nature peut être très rationnelle si elle se fonde sur les résultats de la recherche scientifique. Cela vaut pour acquérir toute connaissance fondamentale de la nature et surtout des processus dynamiques caractéristiques des complexes des organismes vivants du monde entier, qu'il soient terrestres ou aquatiques. Notre connaissance de ces processus détermine dans une grande mesure notre concept de la nature et notre philosophie de la conservation.

Il est également important que nous comprenions suffisamment la nature de ces complexes ou biocénoses, afin de pourvoir évaluer comme il convient l'intensité de l'activité biologique qui est la leur et les situer approximativement par rapport à leur productivité biologique. L'évaluation de la productivité biologique peut avoir une importance considérable du point de vue de l'exploitation et de la conservation des ressources naturelles et pour fournir des directives aux fins d'utilization du sol tant dans les jeunes pays que dans les pays plus développés.

The term "nature conservation" connotes two separate, but related, spheres of interest. One is the realm of nature itself. The other, conservation, is concerned with the things in nature which are of use to man. These two spheres of interest are recognised in the name of the Union under whose auspices we meet - The Union for Conservation of Nature and Natural Resources. It is important that we understand nature as well as resources, and that there be scientific

study of both.

The Study of Nature

A century ago, a great Swiss scientist who came to America admonished his students to "read nature, not books". No better advice could be given today than Agassis gave then. There is need to look at nature afresh, with less reliance upon accepted biological concepts that too often straight-jacket our interpretations of nature. We particularly need to re-examine our ideas of dynamic processes in nature, for these ideas have strong influence upon conservation thought and philosophy, and upon what we do with the natural resources available to us.

In America, the concept of the "forest primeval" is a case in point. We have assumed, and our ecological theory tended to support the assumption, that until the European came to North America the forest vegetation flourished in a climax condition of great productivity, and that the forest was in a state of equilibrium with the prevailing climate of the region. Man was considered to be the primary influence upon vegetation, and it was believed that only he could materially change its composition, stability, or productivity. The impact of the American settler, by his use of fire, axe, plow and cow, encouraged this point of view. We looked upon the action of man as always destructive, and our conservation philosophy embodied this principle.

Scientific study reveals relationships, interactions, and historical perspective which teach us something of the reality of nature. Field research at the Harvard Forest in north-central Massachusetts has shown that recurring hurricanes, before and since the appearance of the European, have had an effect upon the forest as serious as the influence of man himself. Much of this mixed conifer-deciduous forest was felled for lumber in the late eighteenth century. Some of the land was then cultivated, but abandoned a hundred years ago to become covered with pine that was in turn cut early in the present century. The cut-over pineland then became covered again with a mixture of species. One might conclude that such land-use history would do irreparable harm to the forest vegetation of the region. That this has not been true is indicated by research which shows that the species of trees and their distribution in the landscape, as well as their form and age structure, are essentially the same today as they were when the first Europeans reached the region. Man is but one of the factors constantly affecting vegetation. Wind, fire, ice, insects, vertebrate animals, weather, and other non-human factors are all, in one way or another, and at various times, constantly modifying plant growth, often catastrophically. It would seem, therefore, that there is not now, nor has there ever been, any such thing as an undisturbed, primeval, stable type of vegetation.

Those who have been concerned with the establishment of nature reserves as "natural areas" have learned in practical terms something of the dynamics of environmental, interactions when they "protected" such areas. When the manager of a reserve, once grazed,

excludes livestock or protects from fire an area previously burned, conspicuous changes often occur in the landscape. For example, British heathland changes to woodland when sheep are removed; Wisconsin prairie depends upon periodic burning. The changes that occur after an area is protected from fire or grazing may be so marked that the biotic character of the area it was intended to preserve may be lost entirely. Because the very nature of an area to be reserved may have depended upon disturbance, fire or grazing may need to be continued to maintain the reserve in its desired condition. Thus actual interference or manipulation by man or some environmental factor he controls may be essential for the perpetuation of the reserve in the condition which motivated its establishment.

The scientific investigation of nature is of the greatest importance if we are to possess an adequate knowledge of the relation of man to nature and a realistic basis for use and management of natural resources. The existing body of ecological theory seems inadequate for such knowledge and understanding. To better appreciate the dynamics and interplay of plants, animals, soil, climate and the many environmental complexes involved demands intensified effort in field biology. Study of processes in nature should be undertaken in areas intensively modified by man, as in managed forests and grazed steppe. National parks and equivalent areas also provide opportunities for field research, as do forest, wilderness, and other preserves where the order of human use is of low intensity. Research units and experiment stations established in the field provide unparalleled opportunities for ecological investigation. It should be noted that the cost of field research, compared to many other types of biological research or research in the physical sciences, is relatively low, and that the effectiveness of investigations in field biology depends much more upon observation and the alert, creative mind than upon the use of instruments and machines.

The Study of Natural Resources

A recent report of the U.S. National Academy of Sciences defines a natural resource as any naturally occurring element, product, or force that can be utilized by man in his contemporary environment. With respect to nature conservation as defined by IUCN, natural resources include soil, water, air, and the living things dependent upon them, as well as the places the living things inhabit. (Minerals and energy resources usually are not included). These elements in nature are critical components of the human environment, and the relation of man to them is inherent in any consideration of resources.

The President of the United States, in his special message on natural resources to the Congress February 23, 1961 stated:

> "From the beginning of civilization, every nation's basic wealth and progress have stemmed in large measure from its natural resources ... Our entire society rests upon -- and is dependent upon -- our water, our land, our forests, and our minerals. How we use these resources influences our health, our security, economy, and well-being."

In many countries there are already underway large-scale research programmes dealing with natural resources, for example, studies of water and air pollution control, soil conservation practices, wood utilization, production of improved food and fibre crops, better adapted and productive domesticated animals, and practical management of fish and wildlife.

To those of us interested in nature conservation, a special field of scientific inquiry relating to natural resources is of unusual concern. This is the study of the ecosystem, or, as it is termed by the Russian ecologist Sukachev, the biogeocoenosis, an apt term because it encompasses the physical as well as the biological segments of the environment. As with the study of dynamic processes in nature, the study of the interrelationships, interactions, and interdependencies occurring in an ecosystem at a specific site must be approached objectively and without reference to preconceived notions of the relationships involved.

Promising among recent attempts to evaluate ecosystems is the work on determination of biological productivity. However productivity is measured -- by biomass, photosynthetic activity, rate of energy flux, etc. -- the research involved shows promise of leading to interdisciplinary evaluations of the kind and intensity of environmental activity and to interpretations of the potentiality of a site for use of the resources it provides. It is largely upon the promise of this approach that the core of the proposed International Biological Program is based. The IBP, now in the planning stage, will provide ecologists -- terrestrial, fresh water, and marine -- with a new opportunity for research collaboration on an international scale.

The challenge to the world's field biologists in relation to natural resources is greater today than ever before. There is need for rational guides to land use and development among the new nations where land is being put to intensive use for the first time, in order to avoid costly mistakes in choice of sites for specific types of use. Such guides are equally essential in the more developed countries where changing conditions require constant adjustments in land use and management. In the United States, for example, the nation's population increased from 132 million in 1940 to 180 million in 1960. Contrary to what might be expected, the number of farmers who provide food and fiber for these additional millions of people did not increase during this 20-year period, but declined from 30.5 million in 1940 to 15.6 million in 1960. The farmer in 1940 supported almost 11 people, in 1961 he supported more than 27 persons, due to the unprecedented increase in the efficiency of American agriculture.

As the number of farmers decreased, so did the acreage devoted to cultivated crops. The acres once in crops have been converted to grass, tree, wildlife habitat, and more recently to recreation areas. It is estimated that in the next 20 years, 50 million acres of land now devoted to agriculture in the United States will be converted to recreational use. What guide lines can the ecologist contribute to assure sound change in such land-use adjustments? Does he know enough about the soil, climate, plant and

animal life and their complex interrelationships that he can rate the inherent biological productivity of a site in terms useful to the manager of the natural resources the site provides? It should be noted that such biological evaluation may involve guides not only for agricultural, forest, grazing, wildlife, and recreational use of land, but may well provide basic data of help in selecting sites for their aesthetic and scenic value as well.

Wherever ecological investigations are undertaken in the field, co-ordinated research among botanists, zoologists, pedologists, meteorologists, and others is highly desirable. Results of both scientific and practical importance can be achieved if the inter-disciplinary research is directed toward the common goal of understanding the combined effect of the factors influencing the biological activity taking place and of evaluating the productivity that results. Comparison of results obtained in similar environments throughout the world, using standard instrumentation, methods, and evaluations on a scale not heretofore possible, may be advanced through the proposed International Biological Program.

Edward H. Graham

EHG:Id'AA

International Significance of National Parks in Conservation Education

Part 1. Contribution of National Parks to the Advancement of Conservation Education by Harold J. Coolidge.

The theme of the First World Conference on National Parks, which was held in Seattle, Washington, from 30 June to 7 July 1962, was "national parks are of international significance." The success of that Conference and the recommendations emanating from it have given us in a sense a blue print for future action on a worldwide basis.

Such action has not been postponed for future consideration as is often the case. I propose to share my time in this workshop with two of my colleagues who are specifically doing something about the Seattle recommendations. The first is Jean-Paul Harroy, former Secretary General of the IUCN and now serving as Vice-Chairman of our International Commission on National Parks, who is working on the U.N. World List of National Parks and Equivalent Reserves. This list was established by vote of the Economic and Social Council of the United Nations in 1959, and now includes areas reported by 81 countries. The second person is William J. Hart, former Director of State Parks for the states of Nevada and Utah, who is exploring the need for establishing an international office for park systems planning on a worldwide basis.

Three excellent papers dealing with the subject of education as related to the national park field were presented at the Seattle Conference by Daniel B. Beard of the United States, John A. Pile of Southern Rhodesia, and Tetsumaro Senge of Japan. I would like to refer to some of the points made in those papers on conservation education in the three countries represented.

Mr. Beard pointed out how effectively the National Park Service, a U.S. Government Agency established in 1916, has carried forward its mission to assure "that the opportunity to enjoy national parks would be provided and continued in perpetuity." Educational work in U.S. parks started about 1916 with "nature guidings" which meant that visitors were escorted and showed trees, birds, flowers, and rock formations. By 1935 this pattern was well established in many parks and the program under Carl Russell was characterized by the word "interpretation" which was defined as "an educational activity which aims to reveal meanings and relationships through the use of original objects by first hand experience and by illustration media rather than simply to communicate factual information". They appreciated that interpretation was an art, and that its aim was to provoke interest.

Orientation which introduces visitors to what to expect from their park experience adds greatly to the values that they can acquire and this is done in many ways in the U.S. parks by talks, films, and naturalist campfire programs. Then there are "site museums" located at historical and archaeological sites and trailside exhibits that help to explain the story of the park. Actually the park is the exhibit,

and the museums should be thought of as explanatory labels. The latest developments are the visitor centers that are used not only for orientation, but to stimulate interest and answer questions about the park in a relaxed atmosphere. 63 such centers are already established in U.S. parks, and it is expected that there will be 82 more by 1966. Greater emphasis is being placed on self-guiding facilities along park roads and trails because of the crowding and the short time that some visitors have available. Signs, markers, exhibits, nature trails with booklets keyed to numbered stakes or stations are being used. Publications based on research findings for those who want a more serious study of the parks are available.

John Pile emphasized the value of creating a natural resource conservation consciousness to underly any conservation education program. He defines the education program as "(a) the education of the more advanced section of the community to the need for and methods of conservation and wise use of resources: (b) the education of the more backward sections of the population in adapting themselves to the new way of life thrust upon them, and to give them an appreciation of the importance of basic natural resources and how to conserve them for their own betterment and that of their children in the light of their new environment; (c) as progress is achieved with (a) and (b), the stimulation of interest in national parks and museums, and the creation of an awareness of the important part that they have played in research; education and recreation."

Conservation education had to be started in the schools and to accomplish this the Natural Resources Board started conservation education courses for teachers in the school vacations. Two or three such courses catered to some 150 teachers each year. A Conservation Day and later a Conservation Week was instituted, and a definite theme is now taken for a whole year with Wild Life Conservation being the theme for 1961. This education campaign has had a tremendous impact on Southern Rhodesia by creating an appreciation of the wild life resources, their conservation and wise utilization, and the importance of national parks and museums in the overall pattern.

Tetsumaro Senge told how the national parks in Japan are used for study tours as part of the regular curriculum for Japanese school children. In 1959 a total of 45,000 schools had school journeys involving more than 5,000,000 children, and five national parks were among the best ten destinations for such tours. Museums play an important part in this education aspect of national park activities.

Since most of Japan's limited land must be used for the various industries to support its large population, little remains in its natural state. Parks are, therefore, the most outstanding of those places which have managed to retain much of nature and are indispensably important spots to study geographical features, geology, ecology of animals and plants, etc. Japan's parks also include many of the countries historical relics, and are important places for the study of history, archaeology, and the arts and crafts.

Not only these three papers, but many others dealing with such subjects as principles and policies of national parks; scientific, economic and cultural values of such areas; optimum use; administration; and international coordination of national park and reserve programs, contributed substantive material that can be found in the proceedings of the Seattle Conference. The proceedings, which will be published in late 1963, together with papers from the Arusha Conference (Symposium on the Conservation of Nature and Natural Resources in Modern African States) can give us a substantive baseline for all aspects of conservation education dealing with this subject.

If we visualize a world in which most nations have national parks which can be an asset to their economy, and which attract large numbers of tourists often from foreign countries, it seems to me that we have a particular justification for making this subject a primary part of any education program. Such a program will strengthen the support of the park system within a country, as well as encourage visitors to share the values and knowledge that can be gained from this cultural asset. I maintain that natural beauty is the highest common denominator in the spiritual life of mankind, and that the inspirational values to be found in natural areas for the poet, the artist, the dreamer, or the tired city worker are of great cultural significance. We need to stimulate, especially at the elementary school level, a back to nature movement such as occurred at the time of Rousseau in the early 19th Century. If this can be achieved, then the children in elementary schools will not only have a basic understanding of and reverence for the natural world of which man is a part, but they will hopefully take a greater interest in solving problems of stabilizing the natural environment and the biotic community that is dependent upon it for survival.

National parks are a natural area for schools and colleges to visit in their nature study courses. Granted that they should not be used as collecting grounds for specimens, nevertheless they are often well adapted for observation of an undisturbed ecosystem, and their value to science as a reference study area will be increasingly appreciated as the undisturbed areas of the world get fewer and fewer.

Conservation education is particularly necessary for people whose homes are in areas close to national parks. They are constantly being subjected to questions as to the justification of this form of land use as compared to using the same land for some agricultural or industrial purpose. Unless those who are most affected by these areas become convinced of their values, the long range outlook of maintaining them will be jeopardized.

Another target group for whom special knowledge of parks and reserves is most vital is the government planning group which thinks in long range terms, but which is often made up of bureaucrats, who have little appreciation of the significance of what is at stake.

A third group which should have priority are the teachers of conservation in the teachers schools and colleges. They must have a dedication to the cause to enable them to inspire interest in this

new subject, which has the potential not only to fit into existing curriculum of geography, agriculture, soil science, social anthropology, economics, etc., but also can make a case for conservation as a special discipline to which some U.S. colleges have devoted entire departments.

The methods of giving such instruction will be handled in other sections of this workshop, but it seems to me that the preservation of the natural habitat as nearly undisturbed as possible for future ecological studies, as well as for the benefit of the species of animal and plant life that are found there, is the contribution that parks and reserves can make to this important subject. These habitats will have to be classified and zoned, but once this is understood and accepted by those visiting or living in regions adjoining such areas, great progress will have been made in establishing a solid educational base for strengthening the park concept. Another value of such education will be to make it easier to extend the boundaries of the preserved habitat areas.

Perhaps we can dream of the day when the entire world will be covered by a network of parks and reserves where principal biotic environments will be permanently preserved for research, education, and enjoyment of future generations. When that day comes there might be a free flow of administrative and technical people concerned with improved management of such areas who would not only visit areas similar to their own in other countries, but also spend some time carrying out practical work on an exchange basis.

Harold J. Coolidge

HJC:Id'AA

2. The United Nations World List of National Parks and Equivalent Reserves by Jean-Paul Harroy

Our Chairman has clearly and convincingly analyzed for you the numerous ties which link national parks to valuable but as yet too scarce achievements. He also provided an account of the much needed education campaign developing in many parts of the world in favour of the conservation of nature and natural resources.

Upon his request, my statement approaches the problems from a particular point of view. This is indicated by the work to which I have been devoting myself for a year: the establishment of a "World List of National Parks and Equivalent Reserves," a resolution made in April 1959 in Mexico by the Economic and Social Council of the United Nations.

With your indulgence, I shall begin with a brief historical comment.

The idea for a World List originated in 1958, at the 6th General Assembly of IUCN, in Athens and Delphi. It formed the subject of a recommendation which has been transmitted to the Secretary-General of the United Nations.

Next came resolution 713, voted the following year by the Economic and Social Council, requesting the Secretary-General of the United Nations "to establish, in cooperation with UNESCO and FAO, a list of national parks and equivalent reserves, with a brief description of each, together with his recommendations for maintaining and developing the list on a current basis and for its distribution".

This resolution also invited the Member States of the Organization to transmit to the U.N. Secretariat in New York all information necessary for the preparation of this list and the invited IUCN "to assist the Secretary-General upon his request, in the preparation of the proposed list".

By early 1961, the United Nations and IUCN had received 52 replies. They drew up and published a preliminary list, approved by the Economic and Social Council at its New York session in April 1961, which expressed the wish that the work be continued.

A year later, about 30 additional replies were registered and a second list was published, this time through the good offices of the ICNP. This expanded list was presented at the First World Conference on National Parks held in Seattle in early July 1962, in pursuance of the wish expressed by ECOSOC in its resolution of April 1961.

From the Seattle discussions and the subsequent consultations - more particularly those of the IUCN's Executive Board - it appeared that the task was far from being completed, that gaps remained to be filled, that the information published had to be systematized, classified, and even modified in order to establish comparisons among the areas cited

in the list. This is the work to which I have been devoting myself for a year and the work I shall describe for you in a moment.

But first, continuing in the direction of Mr. Coolidge's report, I want to trace the basic purposes behind the establishment of the World List of National Parks and Equivalent Reserves.

The first of these purposes is broadly stated, and encompasses the others. It is to help man to make use of the years left him before economic and social "development" have totally altered the natural world; to constitute an adequate network of national parks and nature reserves where portions of wild Nature will be safeguarded for the many reasons of which we are aware.

Fortunately, the number of countries in which such protected territories exist is large. On the other hand, some nations either do not possess any, or have not succeeded in insuring effective protection to territories which have been set aside. Established sanctuaries are often threatened by covetousness. Almost everywhere, economic interest appears antagonistic to the establishment or defense of the national parks, dedicated, as the term implies, to the satisfaction of the need for beauty, recreation or science common to a whole nation.

The publication of a list of achievements which merit the title of national park - or equivalent reserve - constitutes an international pooling of these sanctuaries, and a common inheritance for mankind. Used tactfully this list may prove useful for a variety of applications.

The first is to induce the governments of the countries where such parks and reserves already exist to insure their maintenance more carefully and to increase their value and number.

The second is to prompt either government authorities or private groups of countries where such sanctuaries do not yet exist, to create them as soon as possible and to provide such protection and supervision required to achieve inclusion in the United Nations List.

Because the validation of inclusion in such a list by high international authority will have been preceded by a strict objective analysis of each of the achievements listed, this might well encourage the responsible authorities to devote more attention to practical measures for maintaining their status in regard to national parks in their countries.

Finally, the systematic work of listing will have the virtue of requiring objective analysis, a long and delicate task with which I have been entrusted, and which will no doubt need more and more clarity of thought. We may hope that this will open the way to a tentative solution to a problem which continues to vex us. Indeed the questions now under consideration were asked the very day when the modern notion of nature protection was born and placed on the agenda of the tasks of IUCN, when the latter was created at Fontainebleau, in 1948. These concern the imbroglio of nomenclature.

The basic idea underlying this classification work is that it is not wise for the U.N. List to give an equal importance to actual situations that fundamentally differ among themselves because of the type of protection that they assure natural habitats on account of their size and the degree of enforcement in the application of their statutes.

In view of these considerations, three criteria were established. These were to enable the selection of the territories and to provide a basis for their inclusion in the list. As a rule, those which would not meet these criteria should be ruled out of the aforesaid list, unless special extenuating reasons justify the contrary in which case the reasons must be provided in the list.

Of course, innumerable shadings and interpretations, had to be considered in applying the basic criteria especially with regard to the level of the development and the degree of human occupation in the countries under consideration. These have been analyzed in a note, of which I have some copies here and which all those interested may consult.

Briefly stated, this is the outline of these criteria:

1st principle: "Areas which qualify as "national parks or equivalent reserves" shall be confined to those areas which have been accorded a status enabling them to enjoy absolute legal protection against human exploitation of their natural resources and agsinst any form of injury to the integrity of the area resulting from human activity. While exceptions may in very special circumstances be made in regard to this principle, it is emphasized that they must invariably be regarded as exceptions."

2nd principle: Unless stated as exceptions, territories below 2,000 hectares in countries of which the population density is less than 50 inhabitants to the square kilometer, or below 500 hectares in countries where this last figure is exceeded, will not figure on the list.

3rd principle: Excluded from the list, irrespective of their legal status, their size or their name, are the territories in which a minimum full-time management staff and a minimum budget per unit of surface are not assigned.

At present, the case of each country is being analyzed in the light of these three groups of criteria. The result of this analysis is transmitted to the responsible authorities for correction or comment. Dubious cases, with the material in support of our conclusions, are submitted for consideration to the members of the ICNP. The territories which have met the criteria will be included in a preliminary draft of the definitive list. Governments will be able to appeal decisions until the authorities of the United Nations are asked again to ratify the full list.

These, briefly outlined, are the main purposes and the main approaches chosen to rach them. As you realize, there is till much to be said in order to throw light on the still numerous obscure points

of this picture.

First, we could, for instance, endeavour to define "equivalent reserves" as mentioned in the ECOSOC Resolution as entities which deserve inclusion with the national parks.

A fundamental point which should be stressed once again is the discretion and tact which must prevail in carrying out of the selections and their handling throughout.

An important aspect which could be treated is the existence of many conservation achievements which, though valuable and real, were excluded from the United Nations list because of their insufficient size or consistency of adherence to requirements (e.g. hunting allowed, but good protection of rare flora). For such protected territories of the seventeen country members of the Council of Europe, the Strasbourg Committee of Experts for the Conservation of Nature and Landscape decided to undertake an enumeration, as complete as possible, of all the European achievements, including the "natural areas established for public recreation". The Executive Council of IUCN, expressed a similar wish for the whole world. Though this should not be undertaken before the list of national parks and equivalent reserves is finished, preparations might be started.

This leads quite naturally to the notion of an harmonious balance to be maintained in each country, among these various provisions, from the strict nature reserves to the Nature park, including the national park and the numerous types of game reserves, forest reserves, natural monuments. Quite logically, the foregoing gives rise to the notion of "park planning" on which our friend William J. Hart will speak.

The hour has come for me to conclude.

I shall do it by knotting the thread between my own subject-matter, the world list of national parks, and yours - "a workshop on conservation education".

The preparation of a balanced list of these national parks and equivalent reserves should contribute greatly to the rational formulation of modern policies and programs in the matter of "conservation education".

But, under the circumstances, most of our efforts will be pointed in the opposite direction, as it is above all the action of education which constitutes the vital ferment for the success of my undertaking, the preparation of the list.

Let us repeat it once more; our purpose is to make use of the list as a psychological lever with a view to incline the peoples and their governments to take advantage of the last years left them to complete their national systems of natural sanctuaries of any type.

And in order that this lever might have a chance of being

of some value, my point d'appui must have been firmly established, through education which has succeeded in gaining their comprehension as well as their will to act. Without these, protection of the existing national parks as well as the creation of new national parks will have been beyond possibility.

J.-P. Harroy

JPH:Id'AA

Part 3. The Projected Park Systems Planning Program
by William J. Hart

Recommendation No. 12 was unanimously adopted by the First World Conference on National Parks because many nations felt, for a variety of reasons, that they should be able to benefit from the experience of others in the park field. The recommendation specifically urged the International Union for the Conservation of Nature (IUCN), as the international leader in the field of conservation, to establish a Committee on Park Planning.

The committee which framed the recommendation included consideration of the whole spectrum of open space reservation which can provide for the daily demands of urban populations, as well as the pure nature reserves which meet the urgent demand for knowledge about the world around us. My task has been to examine the needs of a variety of countries to determine, from the standpoint of need and desire, whether there can be fruitful park counseling at the international level. Based on the reconnaissance, it is hoped that my recommendations to the International Commission on National Parks (ICNP) will enable the Commission to assist IUCN in choosing the best approach to providing the needed services -- it is no longer possible to consider the alternative of not doing the job. All of us are being helped by cogent advice rendered by a special international advisory committee chaired by Dr. Joseph L. Fisher of the U.S.A.

Every effort has and is being made to have a variety of natural, political and economic conditions examined to provide maximum flexibility in the machinery finally instituted by IUCN. Cursory visits have been made to France, Greece, Spain and Mexico. Greater depth was achieved in Costa Rica and a considerable effort was made in Turkey and Colombia. It is planned to do follow-up work to check validity in an African Special Project country and two Asiatic countries. Depending on the funds on hand and the judgment of the ICNP, one country may be selected to try a pilot effort to more critically test the validity of the broad recommendations endorsed by the ICNP.

The matter of terminology is being considered in conjunction with those working on the U.N. World List of National Parks and Equivalent Reserves. The tie is worth mentioning because there is a range of management alternative available to governments governing the use of their natural resources base to achieve the most relevant conservation objectives. Any realistic advice which IUCN gives to a nation must be couched in terms that make sense to the objectives of any nation requesting that assistance. One type of land use solution may not be able to meet all the needs of a particular country. National park use is one such alternative, but it cannot be considered in isolation. What ought to emerge soon is some agreement of the definitions of the alternatives -- particularly from an ecological point of view.

This leads to the observation (understatement) that the needs of countries vary from region to region and from country to country within regions. One way to discuss this aspect is to draw on the countries and regions visited. One can, for instance, say that there is general homogeneity among the countries of the northern Mediterranean which can be compared with the general homogeneous characteristics of Latin America. All of the Mediterranean countries are old and people have been intensively exploiting the natural resources base for centuries. No one seriously disputes the need to embark on large scale tree planting projects to stabilize soil and water and to create a more pleasant life. Such programs are popular. One university president is responsible for planting over 3 million seedlings on his extensive new campus. Each government, as a recognizable force, supports research and nursery operations pointed at massive field planting efforts. Latin America, on the other hand, is a new region. The resources have not been trampled into the ground. Here the emphasis is on accelerating the rate of exploitive use so that economic expansion will keep pace with population increase. Although nurseries have been established, there is little enthusiasm for them. Government is strangely ambivalent in that it controls most investment capital yet is vague and impotent in many subject areas (national park administration is a case in point).

Yet no one can deny that there are great cultural, administrative, and natural differences between Turkey and Spain or that Greece behaves differently than the other two. Costa Rica will react to problems in a different manner than will Colombia or Argentina. The main point here is that one can talk to government officers in northern Mediterranean countries in sophisticated terms about national parks, national forests, game refuges and so on and be able to receive accurate impressions about whether the government will activate programs in any or all of these fields. In Latin America there is a tendency to assume that one form of land use, as national park, will pose the solutions to whole range of resource problems and there is little understanding of the differences in management philosophy involved in the alternative types of designated areas or how the public areas can be complimentary to private land uses.

This means that care must be taken in choosing the talent a particular country needs at a given point of time. It is time, for instance, to have a qualified park planner visit Turkey to make a prototype park plan for a major national park. The planner can be assured of a core of receptive men who can work with him. He can also be assured that the plans will be, for the most part, carried out. Costa Rica needs a general land use planner and administrative specialist who can assist the government in delineating those areas which ought to be receiving conservation treatment of some kind to preserve the watershed resources on which the country is hinging a great deal of its hopes for future growth.

Without exception, the countries face the problem of providing for mushrooming urban populations. Old city parks, designed as passive areas for strolling and sitting, are outmoded and no longer have the capacity to meet the demand of greater numbers of city dwellers, more younger people -- requiring more space for active enterprises --

increasing leisure time, and the other hallmarks of industrializing modern society. Very little thought is given to areas peripheral to the city which can satisfy the demand tomorrow as the city grows outward, or about the implications of putting such requirements into the land use plans for the future development of the city, or about the amenities such planning infers for future residents of the city.

It is worth noting that such planning for the future could be translated into a present benefit by using some of the unemployed people in the city, many of them unskilled rural people displaced by the advance of mechanized agriculture and insufficient land to gainfully support the population. Such "city" people could be used to build park facilities in need today, learn new skills to better equip them for urban life, and teach many of them to appreciate the value of constructive play in industrial society.

Many types of park area, indeed many types of managed land areas, offer many of the benefits of national park management; there is a specific niche in any country's natural and historical heritage that needs to be filled by national parks designed to protect and interpret scientific values of great significance. The basic objective is to recognize a whole system of areas so that each segment of the public presenting demands on the land resource will feel maximum satisfaction and national parks will enjoy the long term security of a nationally recognized land use.

W. J. Hart

WJH:Id'AA

Problems of Protection of Rare Species of Animals

by
C. L. Boyle
Chairman, I.U.C.N. Survival Service Commission

The subject given to me in this course of lectures is the protection of rare animals. Among these dozen talks, mine is the only one in which the word protection occurs. Otherwise the subject is either conservation or development. Indeed, Dr. Dementiev who follows me is to speak of the Conservation of Fauna and I must try to avoid spoiling his pitch.

You will remember that in 1956 at Edinburgh the name of our Union was changed from IUPN to IUCN - "Conservation" instead of "Protection". The implication of that change was that protection was an out-dated concept. So, immediately, in my very subject title I face a challenge, a challenge to justify the idea of "Protection" and I gladly accept it.

A recent addition to the word conservation has been "as a natural resource" which phrase now comes into far too many essays written by conservationists. Instead of "protecting" an animal we are conserving it as a natural resource for the benefit of future generations. Such expressions have unfortunately become clichés and no longer inspire. Nevertheless quite an important principle is involved. In my view wild animals are entitled to exist for their own sakes without consideration of any benefit which may accrue to humanity. But as Man undoubtedly forces himself into the picture and as we ourselves are men, each of us should, I think, be quite clear why he wishes to protect, preserve or conserve wild animals. I believe that, for most of us, the true reason is simply that we feel happy in the knowledge that wild animals exist and miserable at the thought of their being destroyed. All this is quite apart from any use to which we may feel justified in putting them.

Certainly today conservation occupies the largest place in the movement for wild life preservation and it is right and unavoidable that this should be so. We conserve hippopotamuses and saiga antelope to eat them, we conserve seals to clothe ourselves with their skins, we conserve "game" in order that those who enjoy killing may do so; we even try, though ineffectively, to conserve whales. Whether the protection of animals in national parks can properly be called conservation I am not sure; but conservation as generally understood certainly leaves untouched the wide field of man's treatment of the individual animals. It ought at least to leave room for this element, that is protection, for otherwise conservation will fail to gain the support of a large number of men and women who are moved by just this consideration. Indeed there would be vacant seats in our meetings at Nairobi if we were to exclude those who in their hearts are concerned primarily with the protection of the individual wild animal.

In discussing "Protection" I need not dwell upon the keeping of fenced herds of "wild" animals instead of cattle which is making progress in many places, for this is the field of farming and stock raising, but I would like to ask those who deal with wild game management and game cropping to take great account of the preservation of predators. For if the work of management is to remain in the field of nature and not to become just stock raising, the predators should receive as much consideration as their prey. None of the larger predators are yet in danger of immediate extinction, but all are becoming rare enough to need protection.

To turn now to an idea not new but becoming more widespread, that breeding stocks of rare animals should be established in captivity as an insurance against the disappearance of the species in the wild. The eventual purpose behind these attempts may even be the re-establishment of the species as a wild animal. Such schemes will I think generally receive our support, but like all other human endeavours they are subject to dangers.

First there is the risk that the capture or attempted capture of an endangered species will in itself threaten the existence of the species as a wild animal. To my mind the taking of such a risk is not justifiable. The second risk is more insidious; it is that of complacency. The thought that if the project is successful and a captive breeding stock established the continued existence of the species in its wild habitat does not matter very much. I could never acquiesce in such a view, for what matters to me is the living animal in its natural habitat. To this end not only conservation but also protection is necessary.

C. L. Boyle

CLB:Id'AA

Conservation of Fauna

by
G. P. Dementiev
Member of I.U.C.N. Executive Board

Within the limits of the present lecture I shall not be able to go into much detail. Therefore I trust you will allow me to present in the most general way the principles of wild fauna protection as they have been formed historically; reflected, sometimes unfortunately imperfectly, in the legislation and practical life of various countries, and which are also a "general line of conduct" for our Union for Conservation of Nature and Natural Resources.

It should be specified that for some reasons the main importance in discussing this problem is usually given to vertebrates, and primarily to the terrestrial ones. Although in principle no groups of animals differ in importance from the point of view of their protection, terrestrial vertebrates (and perhaps fishes and sea mammals) present the most significant material for study since they have been subjected to the greatest influence of man's activity from time immemorial. Besides, the system of necessary protective measures with respect to these groups are more complicated, just as their contacts with other organisms are more diverse. Finally, we consider conservation of nature as an essential system which is being formed in the interests of contemporary and future human generations, as "conservation" of nature for man, and here we see that man's contacts with terrestrial vertebrates, even if only from a historical aspect, are more wide, and in various respects more effective.

Very extensive and valuable material - both factual and theoretical - is constantly being compiled and analyzed by the Survival Service Commission in the "Red Data Book", and in other works.

I want now to give you some facts as to the history of this problem. In the life of primitive farmers and herdsmen the animal world, in the first place as an object of hunting, played a very important role. Forms of economy being primitive and the population not being numerous there existed no problems of fauna conservation, and Man's attitude to fauna was, if I may describe it so, "friendly". Later on hunting and fishing began to assume economic importance, and, for instance, it is known that the purchase of large quantities of game was made for the needs of Chinghisids' troops. Also, according to chronicles, as far back as 1552, during the campaign of Tsar Ivan the Terrible against the town of Kazan, Russian troops lived on game to a great extent.

However, already in the Middle ages and at the time of the Renaissance the attitude of man towards animals began to change, and the interests of the priviliged class in relation to the hunting of beasts, birds and fish - to use modern phraseology, the sporting interests - came to the fore.

In those times hunting was largely associated with the use of forests, and hunting legislation and forest legislation were, to all intents and purposes, one and the same; being elements of land legislation. (A. Schwappach, 1888, et al).

Privileged hunting, which debarred the possibility of hunting to the broad masses of the population, created certain opportunities for the protection of rare and precious animals such as European aurochs, beavers in Russia, falcons, gerfalcons and other birds. Also due to these measures, preserves were created, for instance the well-known Byelovezhskaya Pushcha. But all this took place some time ago, mainly between the second half of the 18th and the beginning of the 19th century, and to a certain degree, by way of protest against feudal rules and privileges, a new conception regarding nature as a whole and fauna in particular appeared. This new conception, which one could call freedom of opinion, was, in a way, similar to the outlook of laissez faire and laisser aller. At any rate nature as a whole or maybe in its separate elements or resources could not stand such unregulated exploitation, and it was at the end of the 19th and beginning of the 20th century that the unfortunate consequences, deterioration of landscapes, disappearance or catastrophic reduction in the number of certain, and in some cases even numerous, species of animals and plants, etc. were most graphically revealed. This is one of the reasons for the appearance of a new movement for the conservation of nature.

The first aim of this movement consisted in an endeavour to resolve esthetic, scientific and moral problems; for example, the conservation of disappearing species of living organisms, conservation of landscapes, etc. This, so to speak, "pure conservationism" was certainly useful, but it was not sufficient and caused difficulties for the broad development of nature conservation because the economic aspect of the problem, which is extremely significant, was not taken into consideration. It should be noted here that we speak of 'wild fauna', and this is because here in Africa the role of wild ungulates as a source of proteins in the diet of local population is of such tremendous importance, while their attempted substitution by the products of husbandry is not generally practical or even, in many cases, reasonable. In general, conservation of nature is now an extremely important many sided social problem, the parts of which include the economical, public health, cultural - aesthetical and ethical aspects. At present the first aspect, the economical one, requires special attention, as for instance both in "old" states where despite the high development of the economy natural resources were subjected through centuries to the intensive influence and exploitation of man, and in "new" states where the economy is not yet stable and where there is naturally an acute need to raise the living standards within a short period of time. In both the above cases the necessity for the rational utilization of all natural resources is clearly evident.

It should be emphasized that utilization of natural resources must be kept in perspective, since the attitude to the utilization of natural resources based on unregulated exploitation according to the principle "après nous le deluge" obviously caused enormous and often

irretrievable losses. Some situations in nature and their changes are irreversible, others are partly irreversible and some are fully reversible. The question of limits, the possibilities of reversibility of situations and the processes necessary for conservationists to adopt is essential for the proper understanding of the causes of nature conservation, but here we need much more scientific data, which, at present, is still far too scanty.

The basic principles, so clearly justified in a number of countries by the experience and work of many scientific centres are as follows:-

There can be no serious contradictions between the "economic" and "protective" points of view: they are in unity. However, what is important is that ultimately there should be no question of "exclusive rules" governing the creation of reservations, or absolute, or even limited conservation of individual landscapes and species. All this is clearly necessary, for conservation of nature according to modern conceptions consists of a reasonable and carefully worked out system of natural resources utilization. Thus in its essence, conservation of nature should mainly be based on the exploitation of economically important objects - territories, species etc., and the creation of a system for natural resources exploitation which is rational in all respects. Conservation of nature really speaking is no more than man's interference with the life of our planet, and I permit myself to underline the word "interference" since isolation of a preserve is a form of interference. It should be emphasized that in the interests of humanity conservation of nature requires the most wide international cooperation, for nature does not know or recognize state and administrative boundaries.

Later on I shall say a few words on this problem; but in the meantime it should be clearly borne in mind that in the biosphere everything is interconnected.

The importance of international cooperation in the cause of nature conservation in the broadest understanding of the problem is obvious and cannot be too often stressed.

I have allowed myself to dwell on these general conceptions of the problem because they are the basis for the immediate solution of fauna conservation problems in general and also in their individual aspects, association, species, etc.: it is these problems that we shall now consider.

The rational conservation of fauna requires scientific investigation of many types, but first in importance is ecological investigation, both antoecological and syncological; the elucidation of the place of the organism in question, its practical importance, numbers, rarity importance to science, etc.: and in ecosystems, the elucidation of all its multi-sided connections with the environment. It should be recognized that our knowledge of the necessary requirements of many species of animals is still far from adequate, but it is quite clear, however, that it is impossible to

conserve in natural conditions any species without preserving its living conditions: consequently it becomes a complex biogeocenological problem (using V.N. Sukhachev's terminology).

In this connection conservation of fauna requires conservation of landscapes, biocurrents, and the control of pollution in the widest sense of this word.

An essential premise for conservation of animals is the quantitative estimation of numbers, the organization of the service for the calculation of populations of species of particular value for conservation, and also such aspects of their biology as details of the multiplication process, fertility, life span, role of diseases, in particular parasitical ones, and the role played by natural enemies: in short, detailed analysis of the natural regulation of the population. It can be noted here that in this realm too, at least in a number of cases, active interference by man into the life of biocenosis is admissible and reasonable. This interference is expressed in the form of artificial regulation of the number of species, control and even restriction of the number of certain components of biocenosis, introduction and acclimatization, etc. It should be noted that we do not speak here about the destruction of species but about the regulation of their number.

Generally speaking the solution of the problem of conservation of animals requires consideration of natural relations and, to a certain degree, that which the doctors of olden times called vis medicatrix naturae. Unfortunately, experience shows that when a population decreases below a certain level the process of depopulation becomes irreversible, therefore it is important in practice to control this situation as much as possible.

Conservation of any animal species can be effected by "artificial" methods, such as domestication, semi-domestication, zoological gardens etc; and considerable success has been achieved in this field. To quote a few examples: the successful breeding on Soviet farms of the beaver; the work carried out in the USSR and Poland with the European bison bison bonasus; the work carried out by the Prague Zoo with the wild horse equus przewalski - though unfortunately it is believed that there is little hope for the conservation of this species under natural conditions -; and the conservation of Père David's deer elaphurus davidianus. These methods of conservation should by no means be neglected, though they cannot be considered an equivalent to the conservation of species in nature.

In addition to the above, we also possess convincing examples of the possibility of conserving under natural conditions species of animals which were once seriously endangered. For example, in the USSR the elk alces alces; the antelope saiga tatarica, and the sable martes zibellina, and in North America the bison americanus. In all these examples we are speaking of species which suffered from excessive exploitation by man; but there is a happier side to this in that these species have not only been conserved but have recovered so successfully that they are already of economic significance. Recent

history of the wild mammals of Africa gives reason to believe that such methods of conservation are both realistic and hopeful.

But we must be careful that we are not too late in this field. We believe that with such wide scope for conservation in view there can be no conflict between the preventive and economic conceptions. The important thing is the planned approach; the carefully worked out exploitation of the resources, taking into consideration social development, not only for "today" but also for "tomorrow", so that the interests of future generations also is safeguarded. This really is what is meant by the conservation of fauna in the modern concept.

I think it would be as well to consider here the various aspects of the problem of conservation. For instance, in order to preserve for reasonable exploitation resources of terrestrial fauna it is also necessary to increase the utilization of marine organisms, which are not as yet adequately exploited; and it is equally necessary to develop agricultural production, both plant and animal, on a far wider scale. Only in this way, in this broad approach to nature conservation, will it be possible to achieve significant results; results which will not be of economic importance only, as, if it is accepted that the impoverishment of man's environment anywhere makes the world a poorer place generally, it is equally true that if this impoverishment can be avoided or overcome by wise conservation man's environment will also be generally richer.

It is well known that the technical approach to fauna conservation is, to say the least, somewhat varied. In general, however, it amounts to the regulation of utilization - absolute or partial conservation of certain areas, zones or territories - and it is of great importance that agreement should be reached on one major aspect of the problem about which no solution has yet been arrived at either nationally or internationally. When one speaks of the exploitation of natural resources (fauna particularly) is one to assume that everything which is not directly allowed is therefore prohibited? or everything which is not directly prohibited allowed? From the point of view of nature conservation it is, in my opinion, highly necessary to promote the adoption of the first of these assumptions.

In conclusion I would like to emphasize once again that conservation and the rational utilization of natural resources can develop only within the broad limits of international cooperation; a fine example of which is the activity of the International Union for Conservation of Nature and Natural Resources.

G. P. Dementiev

GPD:Id'AA

Conservation Education in the United States

by
the late Richard L. Weaver,
Professor of Conservation and Education,
University of Michigan.

Summary

Conservation in the United States includes all of the natural resources and in numerous instances now includes human resources.

Conservation is not a required subject but is finding wider and wider acceptance as an integral part of general science, biology, geography, history, government, economics, and vocational agriculture. Since each community and each state is given sole responsibility for school programs, considerable variation results in how much emphasis is given to various subjects. Most conservation is taught in the classroom with texts or teacher prepared units of instruction. But the more progressive schools are using field trips, school forests, school camps, school ground laboratories, and community projects to enrich the curriculum, and conservation is being integrated into many courses at all grade levels.

Most states are engaged in a wide variety of in-service conservation education programs for teachers, but only a few colleges and universities offer much in the way of pre-service or professional courses in conservation education.

There is a great amount of help available to schools and teachers from state and federal agencies and national organizations. In fact, teachers now have some difficulty deciding which things to use.

Scope of Conservation Education

Conservation education in the United States is interpreted rather broadly to include all of the renewable resources, including man, and all of the non-renewable resources.

However, all programs are not inclusive of all the natural resources. The emphasis varies primarily with the special interests of the sponsoring agency or group. Generally there is more emphasis on the renewable resources. Many groups do not include human conservation, and others omit non-renewable resources.

As various groups attempt to identify the basic concepts (principles or understandings) which should be included in conservation education, there is emerging a classification system for the concepts based on the degree of emphasis on conservation.

One classification developed for use in Michigan publications group the concepts under the following categories:

I Understanding the Characteristics, Distribution and Status of Each Resource.

II Understanding The Use of Each Resource and Its Importance to Man, and the Problems Created by Use.

III Understanding the Techniques of Management or of Conservation of Each Resource.

IV Understanding the Policy and Administrative Techniques Used for Conserving Each Resource.

In such a classification categories I and II are not considered conservation as such, but rather essential information for the specific techniques to be used in managing or conserving the resources.

Categories III and IV would be considered conservation. Category I is concerned primarily with the natural history aspects of the resource and might more appropriately be considered as science. Category II is usually covered as part of geography.

Place of Conservation in Public Schools

Conservation is not a required course in the public schools in the United States. There are no national requirements of any kind and likewise very few state requirements specifying special courses. Some states such as Wisconsin, Montana, Tennessee, and Florida have stipulations in their school codes which say that "conservation shall be taught."

However, despite the paucity of such requirements a considerable amount of conservation education has found its way into the public school curriculum. This has been accomplished by having it incorporated as a part of various courses in the different grade levels. Such courses as biology, general and elementary science, geography, history, government, economics, and vocational agriculture include some conservation.

To a large extent the amount of conservation included will be dependent upon how much is incorporated in the textbooks selected for the courses. Most of the modern texts for these courses now include some conservation but the extent of coverage varies considerably.

This method of teaching conservation as a part of other courses is called an integrated approach and is favored by many educators and conservationists. The alternative would be to concentrate the conservation information into one course. Such courses could certainly present a much more organized and possibly effective offering of conservation information, but if it is not a required course and only a small number can elect it, then it is well to have an integrated approach along with the special course. Due to an overly-crowded

curriculum it likely would not be possible to make it a required course generally for all students. However, Florida does have a half-year required course for all ninth grade students.

Some high schools in Wisconsin, Michigan, Ohio, and Missouri do offer an elective course in Conservation, but only a small percentage of students elect it. Often it is used as a course for slower students unable to do well in the science courses.

In some cities, notably Ann Arbor, Michigan; Merrill and Milwaukee, Wisconsin; and Zanesville, Ohio, Supervisors of Conservation have been employed to assist teachers in all grades to integrate conservation into the various courses. This will probably be the most efficient way to expand such emphasis.

Teaching Techniques and Facilities

A great variety of teaching techniques and facilities can be used effectively to teach conservation. Some of these are related directly to the classroom, others to the school generally, while others are centered around the school site or the community. An outstanding program will use all of these techniques and facilities.

When conservation courses are taught a textbook is usally used, although some teachers prefer to rely on the numerous publications available from governmental sources and private organizations.

There are but a few conservation texts available for public school use, since the number of schools offering special courses are so few, and therefore the demand for texts is small. Several are listed in the references.

When conservation is taught as a part of other courses, special units are usually prepared on a specific resource applicable to the course.

Teachers usually design their own teaching units using material from many sources, since there is such a wide variety of reference material on conservation available.

A syllabus is prepared by committees of teachers in many communities for science, conservation, social studies, and other subjects, which serve as a guide to the teacher as she plans her teaching program.

Many state departments of education have also prepared syllabi or curriculum guides for teachers to use in conservation. Some of the newer and better ones are listed in the reference.

Some schools extend conservation teaching beyond the classrooms by the use of illustrated lectures in the auditorium for all the children, or by using resource persons from conservation organizations and agencies. Occasionally these organizations are permitted to sponsor special conservation clubs or projects in the schools.

Experiments and demonstrations are used in classrooms or outdoor laboratories to demonstrate such things as soil testing, tree planting, plant and animal nutrition, germination, erosion control and many other aspects of conservation.

Field trips are used extensively in some schools and not at all in others. The trips to the field make it possible to observe first hand such things as erosion and erosion control, pollution, silvicultural practices, plantings for wildlife, food chains, ecological relationships, density and distribution of plant and animal species, farm planning and agricultural practices and many of the technologies related to use and conservation of minerals.

Audio-visual methods are used by most schools and many movies, film strips, slides, and recordings are available to teachers from innumberable sources. Some schools develop their own libraries of slides, pictures, and recordings.

Live animals and plants are often kept in classrooms to teach important concepts of conservation. These help enliven the instruction and create a more attractive classroom, although larger animals sometimes create problems of sanitation, and should not be confined indoors for long periods.

School sites are sometimes developed as outdoor laboratories for teaching conservation and science. Many varieties of trees and flowering plants can be located in such laboratories and nature trails can be used to explain the interesting things about them. In some states school forests also have been developed to serve as study and demonstration areas, and to produce some income. Such outdoor study areas can also serve as wildlife sanctuaries and wildlife management practices can be demonstrated. A Guide for the Development and Use of Outdoor Laboratories has been prepared and is listed in the references.

A growing number of school systems are initiating school camping programs where children live in an outdoor setting for three to five days and study conservation, science, geography, woodcraft and enjoy learning some recreational skills often related to hunting, fishing and camping.

Community study is used as a means of focusing attention on local resource-use problems and programs. Every community can supply a wide variety of important study topics which are related to the life and people and resources of the area.

Education for Teachers

Many institutions training teachers offer a course in the Conservation of Natural Resources usually in the departments of biology, geography, or education. Generally these are elective and not required. However, in Wisconsin since 1935 all teachers are required to have a course in conservation. In Indiana the general science, biology, social studies, home economics, and vocational agriculture teachers are

required to take a course in conservation. In Florida all social studies teachers are required to have a conservation course.

In several states where conservation courses are taught in the high schools teachers can elect majors or minors in conservation as a part of their certification. This is true in Michigan and Wisconsin, and may be the case in Ohio, Indiana and Minnesota.

A major in conservation for a teaching certificate would require 24 - 30 credit hours of courses dealing with soil, water, forestry, wildlife, minerals, human resources, recreation and agriculture. A minor would require 18 - 24 credit hours.

Several colleges and universities offer majors and minors in conservation for certification. They are the University of Michigan, and Central State College at Steven's Point, Wisconsin. There may be several others unknown to the author.

Most teachers in the United States do not take a course in conservation as a part of their undergraduate program. If they receive any instruction in it, it would likely be as an integrated part of courses in the natural or social sciences, and this would be a minor part of the course.

As a result of this lack of emphasis generally, many colleges, organizations, state and federal agencies attempt to fill this vacuum by organizing courses and programs for teachers-in-service. Some type of in-service training is probably available in all states and the larger states may have ten or twelve such possibilities.

Such courses are usually offered during summer sessions on campuses or in some states at camps or outdoor laboratories. Such camps are located in Ohio, Iowa, Indiana, Connecticut, West Virginia, New Hampshire, New Jersey, Maine, Wisconsin, Michigan, Massachusetts, California, Illinois, North Dakota, and New York. In several instances private organizations such as Audubon Societies operate the camps. This is true in Maine, Connecticut, Wisconsin and Wyoming. In Wisconsin a group of Forest Industries also operates a camp used by teachers and also high school students on a year'round basis. In Michigan the State Department of Conservation operates a Training School for teachers and their own personnel on a year' round basis.

Such camp programs place a major emphasis on field studies and offer teachers an interesting and profitable learning experience outdoors.

Many of the campus in-service programs have been changed from the traditional lecture courses to conservation workshops, where the participants assist the staff in establishing the goals and the organizational structure; the selection of problems to be studied, the films to be used, and the trips to be taken; and in evaluating the success of the program. Major emphasis is placed on the production of usuable teaching materials, and plans of action. Teachers in-service readily

respond to such responsibility and frequently find that they can also use this technique in the classroom with students. Several guides are available on the operation of workshops and are listed in the references.

Professional and Graduate Programs in Conservation Education

There are just a few colleges and universities offering graduate and professional programs in conservation education. In three universities; University of Michigan, Michigan State University, and Ohio State University a student is able to obtain a Bachelor's, Master's and Doctor's degree in Conservation or Conservation Education. Cornell University has long been active as a graduate center of Conservation Education. Central State College at Steven's Point, Ohio was the first college offering a Bachelor's degree in Conservation. Purdue University specializes in Master's degree in Conservation. Many other colleges are now able to offer Master's degrees in Conservation. For a short period Yale University specialized in a Master's degree in Conservation, but this was not designed particularly for Conservation teachers.

The program at the University of Michigan, which is the most extensive one in the United States has a three-fold approach. One-third of the courses for the various degrees are based on the natural sciences, one-third on the social sciences and humanities, one-third on natural resources or conservation courses.

The Department of Conservation is in the School of Natural Resources, which also has departments of Forestry, Wood Technology, Wildlife Management and Fisheries. The enrollment in the School averages about 265, with 35 - 40 students in conservation. Of these usually one-third are interested specifically in college teaching or public education as a career.

Some of the professionally trained conservation educationists teach school, while others work in education and information divisions in state and federal agencies or national organizations and industries dealing with resources. Some become supervisors in state or local departments of education where they assist teachers and school administrators in getting more conservation education into the public school programs. This seems to be our most hopeful avenue of integrating conservation widely and effectively throughout all of the public school curricula.

The Role of State and Federal Agencies

State departments of education vary considerably in how much they emphasize conservation. Only six states have conservation specialists spending full-time assisting schools. They are Ohio, Illinois, Colorado, Montana, Maine and Massachusetts. In a dozen other states one person may spend considerable time emphasizing conservation but he also has numerous other obligations.

The more active states emphasizing conservation at the state

level through education departments usually do the following things:

1) they have leadership responsibility centralized in at least one trained staff member,

2) they have a curriculum guide or syllabus in conservation,

3) they have films on conservation available for school use,

4) they have advisory committees of teachers, school administrators and representatives of resource agencies to help plan and guide the state program,

5) they encourage and assist colleges and universities in training teachers in conservation,

6) they provide consultant help to local school systems interested in increasing their emphasis on conservation.

State Departments of Conservation usually are vitally concerned with ways and means of getting more conservation education into the schools. Many of them employ professional conservation education specialists to assist teachers. Nine states have a full-time conservation specialist who works especially with staff members in the state department of education to conduct a state-wide program. In twenty-three other states one or more full-time conservation education specialists are also employed to conduct special types of educational programs, not always directly related to school programs.

Such conservation departments specialize in the following type of educational work:

1) lecturing to and leading field trips for teachers and students,

2) preparing bulletins and films for school use,

3) organizing conservation clubs and camp programs,

4) lecturing to garden clubs, women's groups, youth groups, and other service clubs,

5) helping with in-service courses, workshops, and camp programs for teachers and youth leaders.

Federal Resource Agencies such as the U.S. Forest Service, U.S. Soil Conservation Service, U.S. Fish and Wildlife Service, U.S. Extension Service, U.S. Office of Education, U.S. Bureau of Reclamation and the Tennessee Valley Authority employ one or more specialists in conservation education. The Forest Service has at least one such specialist in each regional office. Other agencies which have tried having regional specialists previously have had their appropriations

reduced and had to eliminate these positions, since some Congressmen view such activity as propaganda and fear the programs will have political implications. Thus, most federal agencies have had to be satisfied with minimal staffs for this important work.

Such agencies usually engage in such activities as the following:

1) preparation of educational materials for school use - bulletins, movies, tape recordings, slides, and radio scripts,

2) assist states in the preparation of materials and supply materials in quantities for state distribution,

3) assist colleges and universities in operating courses, workshops and camps for teachers,

4) provide radio and television shows for national distribution,

5) organization of youth groups such as 4-H Clubs and Future Farmer Associations.

Role of National Private Organizations

National organizations interested in various types of resources such as forestry, wildlife, parks, and wilderness are usually much concerned with ways and means of getting greater emphasis on conservation education in schools and youth groups, as well as among their own members.

They include such groups as the National Audubon Society, the Izaak Walton League, the National Wildlife Federation, the Wildlife Management Institute, the American Forestry Association, the Sierra Club, the Wilderness Society, the National Parks Association, the Sport Fishing Institute, the Boy Scouts of America, Girl Scouts Incorporated, and the Campfire Girls.

Most of the organizations have a regular magazine and/or a news service to help keep their members and others informed. A few like the National Audubon Society prepare extensive educational materials. Many of the organizations prepare materials which are suitable for school use and frequently supplied free or at low cost.

The youth organizations have special requirements and awards in conservation and have special printed materials to help members prepare for such requirements or awards.

The National Audubon Society and several state Audubon Societies operate in-service training centers or camps for teachers where conservation is emphasized. Several state Audubon Societies provide visiting teachers to teach conservation in various schools.

Most of the national organizations also provide limited consultant help to state and local groups, prepare radio and television materials, and help to promote sound conservation laws at the federal and state levels.

Industries or organizations with industrial membership are also active in providing educational materials for school use, some consultant help, and a considerable quantity of films, and recordings for free use by schools.

These include such groups as the American Forest Products Industries,Inc., the National Association of Manufacturers, the Petroleum Institute, the Bituminous Coal Institute, the American Iron and Steel Institute, and many others.

In addition such large companies as United Steel, General Motors, International Harvester, Standard Oil, Bell Telephone, and numerous others prepare many films and bulletins for school use.

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Experience in Conservation Education and Propaganda of Nature Conservation in the U.S.S.R. and in the Countries of Eastern Europe

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At the present time the cause of nature conservation has acquired great social and economic significance. The wise, harmonious, planned use of natural resources together with constant care for their restoration and multiplication are indispensable for raising living standards, protecting human health and satisfying the cultural and aesthetic requirements of people. For this reason the cause of nature conservation in the USSR as well as in the other Socialist countries is being given increasingly greater attention.

In the campaign to promote nature conservation an important role is assigned to building up a proper attitude towards natural resources. This is achieved by means of organized training and education of the younger generation, by broadscale dissemination of special literature, wall sheets, leaflets and other material, as well as by means of the press, films, radio, television, museums and other cultural-educational institutions.

The teaching of the elements of nature conservation at educational institutions and the popularization of conservation ideas are required by legislation. For example, the Law on Conservation of Nature in the Russian Soviet Federative Socialistic Republic passed on October 27, 1960, contains the following articles:

"In order to inculcate in young people a spirit of concern towards natural resources, and to impart practical skills and habits in the use of these resources, the teaching of nature conservation fundamentals shall be included in the school curricula as well as the corresponding sections of the course of natural science, geography and chemistry; the required courses on nature conservation and reproduction of natural resources shall be organized at higher educational establishments and specialized secondary schools taking into account their specializations". (Article 18).

"The cultural-educational institutions and organizations, publishing houses, museums, cinemas, radio, television, editorial boards of the newspapers and magazines, voluntary societies shall broadly popularize the tasks of conservation of nature and reproduction of natural resources". (Article 19).

The Law on Nature Conservation in the People's Republic of Bulgaria (passed on August 27, 1960) states that "teaching citizens to love their own countryside and to popularize the scenic beauty of Bulgaria is an integral part of nature protection and conservation".

In conformity with the Laws on Nature Conservation the educational bodies of the USSR and of the countries of Eastern Europe provide for the teaching of nature conservation fundamentals at all stages of training.

Topics on nature conservation are introduced in the very first grades of school. For example, text-books for the first and second grade in the schools of the Turkmen Soviet Socialist Republic contain topics on how to feed birds and why it is so important to love and study nature. First form pupils at the schools of the Latvian Soviet Socialist Republic have stories such as "A Small Wooden Box for Starlings", "In the Woods", etc. The text-book for the "Third Reader" at schools of the Kirghiz Soviet Socialist Republic contains the following topics: "In Walnut Orchards", "Birds are Our Friends", and "The Waters and Rivers of Kirghizia". Second and third form pupils at Russian schools in their reading lessons acquire general information about forests, their protection and cultivation: the children observe birds, learn how to feed them in winter, etc. At the primary schools of Yugoslavia the principles and practice of nature conservation are studied in a course called "Know-Nature". Primary schools in the German Democratic Republic, Poland, Czechoslovakia and other countries present many different topics which foster a feeling of love and concern for nature.

In the schools of the USSR considerable attention is also paid to nature conservation themes at geography, botany and zoology lessons.

The problems of the wise use of natural resources and the importance of cultivating an attitude promoting the preservation of these resources are introduced in the course of studies in geography for the 7th - 8th as well as the 5th - 6th forms throughout the school year. The program includes such topics as "Conservation of Nature", "Nature Reserves", "Protection of Inland Waters", "Measures for Forest Protection" etc.

Botany lessons in the 5th and 6th forms deal with the role of plants in nature, the national economy and man's activities. The children learn about the preservation and cultivation of forests, the protection and preservation of rare plants and nature conservation legislation.

At zoology classes in the 6th and 7th forms the pupils learn that measures for the protection and propagation of the animal world are indispensable; fishing and hunting regulations are studied as well as the problems of distribution and reproduction of animals.

A General Biology course in the 9th form completes the biology program in soviet schools. It contains a special section called "The Effect of Human Activity on the Vegetable and Animal Kingdom". The school children learn what happens to soil and climate with the disappearance of forests. They are taught what measures should be taken for soil conservation and fertility; about the effect of flora and fauna of water, soil and air pollution from industrial waste; about the bio-

logical principles of nature conservation, etc.

The problems of preventing the pollution of natural environment by chemical industrial waste, the campaign against air, water and soil pollution, and the protection of green planted areas are given special attention in the sections of the chemistry syllabus which deal with the study of chemical industries.

The problems of nature conservation are broadly reflected in the study of various subjects at the schools of other countries as well. For instance, text-books for non-specialized and a number of specialized schools in Czechoslovakia include chapters dealing with the main principles and tasks of nature conservation. In Yugoslavia, nature conservation topics are also studied at classes in home economics, physics and chemistry. Polish schools are conducting useful experiments. As in many other countries, schools in Poland have no special nature conservation course, but material concerned with nature conservation problem is included in the programs of other subjects. Teachers are specially instructed to check the pupils' knowledge of nature conservation and appraise it accordingly.

In the USSR considerable attention is given to extra-curricular activities in field work. Practice in nature conservation is an integral part of study. Young naturalists participate in the preservation and development of wooded areas - they feed useful animals, plant greenery in populated areas, along the roads, in ravines, and engage in other such activities.

As a means of drawing pupils into the useful work it is recommended to set up school sanctuaries for wild life, forestries, forest gardens, fish and game preserves.

In the wild life sanctuary which was organized by one of the schools of Yakutia the children independently work for wildlife conservation. They put out artificial nests and ring the birds. In the school forestries of Byelorussia the children grow young plants, plant trees and cultivate them. In Armenia the activities of forest garden organizations have been greatly expanded. Every year young Armenian naturalists graft cultivated varieties of plants on to different kinds of wild fruit trees. Tens of thousands of wild fruit trees are thus treated. School forest gardens are also being set up in the North Caucasus, in areas west of the Carpathian Mountains and in other regions of the USSR.

In the steppe-lands of Kazakhstan school children help a great deal in planting trees and shrubs on newly organized State Farms. Their slogan is: "Let us grow 4 - 5 fruit trees or 7 - 10 decorative trees around every house".

Every year the young people of our country take an active part in holding a "Forest and Garden Day", and a "Bird Day". For instance, in the spring of 1962 more than 300,000 school children in Kirghizia participated in such activities. They planted 470,000 fruit and decorative trees and shrubs. In the spring of 1963, marking 100

years since Kirghizia joined the Russian State, the children planted orchards at 250 eight-year and secondary schools; in regional areas they helped to plant wind breaks and greenery in town and settlements; and they pledged to look after the planted areas and to ensure their preservation.

In Rumania, Hungary and other countries school children are drawn into the work of protection and feeding of game-birds, roe deer, red deer and other animals. A number of secondary schools in the Estonian Soviet Socialist Republic carry on extensive activities at Nature Conservation clubs.

Many children's clubs, children's excursion and tourist centres as well as other educational institutions in the USSR and the countries of Eastern Europe organize excursions and hikes for children for the purpose of nature study and to carry out some of the projects connected with nature conservation. Nature conservation commissions and other scientific institutions draw school children into the work of carrying out research assignments. They are given tasks such as discovering nature monuments, and the inspection of forest and water areas. School children in the Ukraine have recently done a great deal of this kind of work.

Successful popularization of nature conservation ideas and conservation education among the youth depends to a great extent on how well the teachers are acquainted with the principles and techniques of nature conservation. For this reason subjects concerned with nature conservation are included in the curricula of courses, raising the teachers professional qualifications as well as advancing the qualifications of school authorities. Special lectures are delivered for them on methods of teaching nature conservation, on the rational utilization of natural resources in local areas, on practical activities, and measures for establishing school museums showing aspects of nature conservation, and other points.

State bodies on nature conservation in Estonia hold special three-day workshop sessions for the teachers of secondary specialized educational establishments during school holidays. The knowledge acquired by the teachers at the workshop is of great help to them in presenting the material on nature conservation included in the courses which they teach. The same applies to the lessons given by form masters.

A University on Nature Conservation, open to the general public, has been set up in Armenia. Its main purpose is to spread scientific information on natural resources and to raise the professional qualification of teachers of biology and geography at secondary schools.

To solve the problems of nature conservation it is very important that specialists working in different branches of industry, agriculture and at construction projects, workers in the field of education, public health and culture be aware of the tasks, principles and methods of nature conservation, so that in their spheres of activity

they may be guided by the acquired knowledge. That is why in training future specialists at higher schools it is essential to popularize the principles of nature conservation.

At the sixth and seventh General Assembly of the International Union for Conservation of Nature and Natural Resources (IUCN) unanimous support was given to the idea of introducing a special course of studies on "Nature Conservation" as a required subject in the curricula of universities, pedagogical, agricultural, forest management, technical, and medical higher educational establishments. Soviet specialists working in the field of nature conservation have repeatedly expressed the same opinion at conferences held at home and abroad. Study courses on nature conservation in the programme of higher educational establishments are required by the Nature Conservation Laws in a number of Soviet Republics. Nature Conservation courses at different types of higher schools will probably be subject to certain modifications. For example, it is clear that students specializing in biology will learn about the role of nature conservation in the national economy (problems of the preservation and utilization of fauna and flora would be studied in courses on zoology, botany and ecology). But nature conservation courses for engineers and economists will stress the effect on animate nature following the development of natural resources of one kind or another and how the changes will affect the economy. The primary aim of the course of studies, no matter at what type of educational institution it is introduced, is to teach nature conservation in such a way that the students, once they become skilled specialists,can, in their future spheres of activity, make a valuable contribution to the conservation, all-round rational utilization, and rehabilitation of natural resources, and to the popularization of nature conservation ideas among the general public.

The object of the studies will be fully achieved if young specialists come to understand the principles of nature conservation as an integral part of their approach to world affairs and civic responsibilities, and if these specialists are guided in their practical activities by the above principles, no matter in what field they work; in industry or agriculture, in the public health services, or at cultural or educational establishments.

In 1961 the Permanent Commission on Education of IUCN with the participation of specialists of different countries worked out a general program of a nature conservation study course, which in our opinion, may be used as a basis for drawing up the programmes of such courses to be studied at higher schools of different types in many countries of the world. The Program was reported to the Executive Board of IUCN at its Meeting held in November 1961. The Board approved the Program, which was published in English and French, as a "Special Educational Supplement" the second in IUCN Bulletin No. 3 of 1962.

It will interest the workshop to know that we used this Program as a basis in drawing up the general program of the course of studies on "Nature Conservation" for the higher schools of the USSR.

It comprises the following sections:

I. Introduction.

II. The Effect of Human Activities on Nature;

(a) Growing utilization of natural resources as a result of the development of human society;

(b) Relative extent of contemporary utilization of natural resources in the world and in individual countries;

(c) Alterations to the natural scene undertaken in the interests of man;

(d) Unfavourable changes in nature and the consequences of irrational utilization of natural resources;

(e) Biogeochemical activities of man.

III. History of Nature Conservation.

IV. Nature Conservation in our Time.

(a) Natural resources of the USSR;

(b) Conservation legislation;

(c) Regulations concerning the utilization and conservation of natural resources;

(d) Measures designed for the conservation, restoration and enrichment of natural resources;

(e) Conservation and enrichment of natural environments around cities and industrial centres;

(f) Regions enjoying special protection;

(g) Administration of regulations designed for the conservation of nature;

(h) Role of educational establishments in popularizing the concept of nature conservation;

(i) Participation of the general public in nature conservation;

(j) The role of science in nature conservation.

V. Nature Conservation in Foreign Countries.

VI. International Aspects of Nature Conservation.

This general program is used by the teachers of different higher educational establishments of our country in drawing up programs of study courses corresponding to the speciality of the particular educational institution.

Ever year more and more higher schools in the USSR include nature conservation courses in their curricula. At the present time this course is taught at all the universities (at Soil-Biology and Geography Faculties), at the majority of pedagogical institutes, and at a number of agricultural, forest management and polytechnical institutes of the country. The course on "Legislative Regulations for the Conservation of Nature" is taught at many institutes of jurisprudence and at the corresponding faculties of the universities. Usually the amount of time devoted to the course on Nature Conservation is about 40 hours.

In Poland the course on Nature Conservation calls for 30 hours of study at the Biological Faculties of all the Universities; and at all the agricultural institutes it requires 40 hours of study. The same applies to the Academy of Mines. In Czechoslovakia this course is studied at the Faculty of Natural Sciences in universities during the winter term with three hourly periods per week. The Ministry of Education in Bulgaria has made provisions to introduce, with effect from the start of the coming school year, the course of studies on Nature Conservation in the curricula of agricultural, forestry and construction-engineering technical schools and at a number of secondary specialized education establishments.

Teaching nature conservation fundamentals at the Higher School is not confined to the lectures scheduled in the Nature Conservation course. The syllabi of universities and of different educational institutes in botany, zoology, plant and animal geography and physical and economic geography provide for clarification of the problems of nature conservation in lectures and in field work. The course on the "Economic Geography of the USSR", acquaints the students with the goals of planned, rational utilization of natural resources, and with the changes in nature in the interests of a socialist society. At the pedagogical institutes students specializing in geography and biology are given a special course of practical training in the study of local lore. They learn about nature in their home region, and about the measures being taken to conserve nature.

During summer field practice, natural science students of pedagogical institutes help the schools in carrying out the work of nature conservation. The popularization of nature conservation ideas among the general public is required by the syllabus in student field practice at a number of institutes.

The various chairs conduct the research on nature conservation problems.

The popularization of nature conservation among wide sections of the population in the USSR is carried out by nature conservation societies in various republics. Among the members are a great number

of nature lovers, workers, collective farmers, school pupils, teachers, men of science, and other specialists.

The societies publish popular science books and literature, organize discussions and lectures for the general public, and inspire the population to carry out the practical tasks of nature conservation. The All-Russian Society on Nature Conservation, comprising about seven million members, issues the publication "Nature Conservation and Greenery Planting".

There are similar public organizations in the countries of Eastern Europe. A particularly extensive work on popularizing nature conservation is being carried out by the League on Nature Conservation. (Liga ochrony przyrody) in the Polish People's Republic. It publishes its monthly journal "Przyroda Polska" (Polish Nature) as well as diverse propaganda literature designed for the general public.

In the German Democratic Republic the work of popularizing nature conservation among the general public is carried out by the organization called "Kulturbund". This organization together with the Society for the Dissemination of Scientific Knowledge of GDR issue the journal "Wissen und Leben" (Knowledge and Life).

The principal scientific institutions concerned with nature conservation in the countries of Eastern Europe are: The Institute of Landscape Management and Nature Conservation in the German Democratic Republic (Institut für Landesforschung und Naturschutz Halle/Saale); Institute on Nature Conservation in Poland (Cracow); State Institute for the Protection of Monuments and Nature in Czechoslovakia (Praha); Council on Nature Conservation in Hungary (Budapest); Commission on Nature Conservation in Bulgaria (Sofia) and Rumania (Bucharest); Institutes on Nature Conservation in Yugoslavia (Zagreb, Sarajevo), and the Central Laboratory on Nature Conservation of the USSR Ministry of Agriculture.

The efforts that are being undertaken in the USSR and in the countries of Eastern Europe in the field of conservation education and the popularization of nature conservation concepts must be extended. We are faced with many big and complicated tasks and it is an honour as well as the duty of nature conservation champions, teachers, scientists and state officials to do their utmost for the solution of these tasks.

L. K. Shaposhnikov

LKS:Id'AA

Experiences in Conservation Education and Nature Conservation Propaganda in the Countries of Western Europe

by
J. Goudswaard
Secretary I. U. C. N. Commission
on Conservation Education

Of what use is it to us if we create large National Parks, if we undertake conservation measures in several countries, if we fight for good legislation and for good conventions for the protection of rare animals, when the basic idea of nature conservation has not yet entered the minds of the people?

All specialists in nature conservation, through their work of direct protection of nature, have also a very important task in popularizing the idea of nature conservation in the field of education. This is of extreme importance, and I shall now be pleased to tell you about some experiments in conservation education in several countries of Western Europe.

In Belgium the introduction of a course on nature conservation in the universities is recommended. Such a course was given in the State University of Ghent. Special nature camps have been organized. In these camps practical work on nature conservation in nature reserves was lectured on and practiced. These camps were sponsored by the Ministry of Education and by private nature conservation organizations. In the last ten years the Belgian School Broadcasting (Flemish network) had provided a program of natural sciences, especially focussed on nature conservation. Not only school children listened to these lectures, but a great many adults - probably more adults than children. In 1957 a course on nature conservation was started which has since been repeated three times on the radio and published in several magazines. The course consists of a complete series of all lectures each of twenty minutes duration; a short summary of each lecture was sent to all schools, so that the teachers were able to introduce the subject before the broadcast.

Nature conservationists are collaborating on both the Flemish and French television programs. The French program "Histoire Naturelle" had run for more than three years and was one of the most popular. About 87% of the television-set owners in Belgium watched this, namely about one million people. Living animals are always shown on this program and their importance in the balance of nature is emphasized. Other popular television programs were used to introduce nature conservation principles - nestboxes were shown and their use explained in the children's program; nature reserves were visited in a program for young people. More than 2,000 letters were received after a program on nestboxes and the same number of booklets on this subject were dispatched to listeners. The Flemish school television was due to start in 1962.

Of the first ten programs, four were directly concerned with nature conservation.

In Denmark, at any rate, the lines of education are very firm, with the happy modification, however, that the individual teacher will in almost every case be authorized to make certain changes in the curriculum. This, however, generally means that any curtailment within one subject must be compensated through an increase in other fields. It has been from the beginning a primary target to have nature conservation definitely embodied in the government orders and regulations. This has now been done in the Education Act adopted during recent years for primary as well as secondary schools. In the primary schools the pupils are taught to observe and describe plants and animals and arrive at conclusions from their observations, and importance is attached to encouraging the pupils to self-activity. The education moreover can give them sufficient understanding of the laws of biology and the interplay in nature. Through such understanding it should be possible to make the pupils take a positive interest in nature conservation so as to make them aware of the measures that man must take to protect plant and animal life. Where the school is situated in suitable natural surroundings, some of the classes may be arranged outdoors, so that, weather permitting, the pupils can make observations and collect material for subsequent treatment at the school.

In the secondary schools, examples of ecological conditions should be given whenever such examples appear natural in connection with the curriculum, and the importance of ecology for proper understanding of evolution should be emphasized. Moreover, an innovation has been introduced into the two upper forms of the secondary school, the so-called "free lessons", which are held once a week. This innovation provides possibilities for establishing study circles and for calling in lecturers for one weekly lesson. In such study circles a few lectures on nature conservation are arranged.

As to the institutes of higher education, it can be observed that at the Royal Veterinary and Agricultural High School of Denmark it is intended to establish a chair of nature conservancy in the near future, and the occupant of the chair has already been designated. The lectures will be compulsory for students of forestry. It is hoped to extend this obligation to comprise other faculties within the Royal Veterinary and Agricultural High School.

In the Open Air Council, out of school activities of many organizations in Denmark are linked together. To promote a greater understanding among the people and more particularly in the rising generation, of the importance of considerate behaviour in nature the Open Air Council has prepared a guide entitled "Considerate Behaviour in Nature". At the same time instructions are worked out for the use of the guide in teaching. Stickers to be glued on the loose paper wrappers on the natural history books are printed. On the initiative of the Open Air Council the Guide together with direction and stickers is distributed to all schools.

Finland In order to extend the work as widely as possible

among young people, the Finnish League for Nature Conservation has continued to keep closely in touch with the teachers' organizations. A composition competition on subjects in the field of conservation has been organized every year for the students of Teachers' Colleges through the initiative of the League and with the financial help of the Ministry of Education. The best compositions have been published in the periodical of the League.

In the youngest university of Finland, the University of Oulu which was founded in 1959, lectures on nature conservation for students of biology were started in the autumn term of 1960. The lectures have been compulsory, so that all the students of biology have attended them. The lecture course has lasted one term and comprised one hour's lecture a week.

In the University of Helsinki, in its Division of Mathematics and Natural Sciences and the Faculty of Agriculture and Forestry, lecturing has been carried on as before, likewise with a lecture course lasting one term. The lectures are compulsory for students of forestry. They have been voluntary for students of biology, but a suggestion has been made on behalf of the students that they should be made compulsory for all those intending to become teachers of natural science in secondary schools. A ten hours lecture course on conservation was held in the university summer courses at Vaasa in the summer of 1962. Nature conservation has been given more and more room in the activities of student organizations. In the summer of 1961 the student corporation of North-Finland arranged a two days course on nature conservation for the road builders in northern Finland. The young people's societies of the country arranged an information contest within the scope of education expected of every good citizen in 1961. Among the source works given, the "Handbook of Conservation" by Professor N. Söyrinki was also mentioned.

Western Germany In 1952 a resolution was passed by the Permanent Conference of the Ministers of Science of all States that the principles of nature conservation should be taught in every type of school. Ten years experience has shown that this resolution was of very little use without facilities for helping and training the teachers in the different grades. The government tried to help by providing sets of slides for the schools with instructions to the teachers to do preparatory work in the class-room before visiting the individual sites, but the staff involved in preparing these sets were so overloaded with work that other means must be found.

Elementary schools do not have biology lessons. But they have lessons, which are called "Heimatkunde" and with these lessons the children get also the main conception of biology. During the "Heimatkunde" lessons they frequently go out of school to visit characteristic landscapes in the vicinity. Very often the children of the elementary schools are brought to the zoological and botanical gardens. Schoolgardens are very rare. The training of teachers for elementary schools for biology and especially for fieldwork is very poor. There are a few private organizations, especially the "Bund Naturschutz in Bayern", who offer training in fieldwork during the holidays. These training camps get

no support from the government and the teachers have to pay for their expenses themselves.

In the different types of German Highschools (age of the children 10 - 19 years) Biology is taught twice a week in the lower grades. The lessons last 45 minutes; there is no time to go outside. In the upper grades, from the sixth grade (age 16 - 19) there is only one biology lesson a week. In the last grade, biology is no longer compulsory. The pupils can choose, whether they want the 45 minutes of biology once a week or not. It is interesting, that most pupils do want biology, about 70 - 80%. Fieldwork can only be taught in the spare time of teachers and pupils. Clubs, such as the "Deutsche Jugenbund für Naturbeobachtung" are doing very good work in this field. During the holidays they arrange training camps in different parts of Germany. These activities are only on a private basis and get no support from the government. The interested boys and girls are guided by teachers, who spend their spare time and their holidays to train the young people.

Attempts were made to try to reach adults by guided tours usually on Sundays through a special area. The Sunday newspapers publishee a long list of these tours and sometimes more than fifty people joined in each one.

In close cooperation with IUCN's Commission on Ecology Dr. W. Engelhardt, together with several other authors, is preparing a conservation text-book for lectures and professors who wish to introduce conservation principles into their courses. "Handbuch für Lanschaftspflege und Naturschutz". (B.L.V. Verlagsgesellschaft München-Basel-Wien, ± 500 pages)

For many years Verein Naturschutzpark and its president, Dr. Toepfer, has organized annually an International Study Course in the National Park Lüneburgerheide. The object of the course is to make the participants familiar with the problems of and practical work in modern nature conservation.

Great Britain The Study Group on Education and Field Biology of the Nature Conservancy, under the presidency of Mr. E. M. Nicholson, was set up in the autumn of 1960 and has assembled most of the readily available information about the different projects and courses in field studies in Great Britain, and has analysed in detail the difficulties that have been encountered. One of the tasks of the Group has been to promote research and experiment on biological education on the largest possible scale. The Group has done an immense task of analysing questionnaires from 2,000 schools as well as from teacher training colleges, and in trying to measure the aspects which could be expressed quantitatively. The Study Group has also tried to compare what happens in three countries abroad. The report, although not claiming any official status, will be of immense interest to you all. Entitled "Science Out of Doors" (240 pages), is published by Longmans, Green and Co. Ltd., London, 1963.

Under the institutions at present providing instruction and facilities for field studies must be mentioned the Field Studies Council. The Council operates the most effective system of field instruction in Great Britain. The centres are residential and normally courses of one or two weeks' duration are conducted by the staff and invited specialists. They provide mostly for 6th form pupils and university undergraduates in biology, geography and geology, and special courses are also arranged for teachers from time to time. As regards finance for field study purposes, very little was contributed directly by the Government (i.e. the Ministry of Education gave a small grant, which would soon come to an end, to the six Field Studies Council centres), but a certain amount came from the government indirectly through local education authorities who paid for individual students to attend the Field Studies Centres. Money raised specifically for field studies, however, came mainly from, voluntary and charitable sources, such as the Carnegie Trust, and then only on a small scale. The Field Studies Council needed outside money for capital to open the several new centres necessary to meet the rising demand, but apart from this they could pay their way on current income. The Nature Conservancy and a lot of other organizations carried out a number of activities during the National Nature Week in May 1963. This action was country-wide and used all means of publicity: newspapers, periodicals, radio and television. A series of special stamps was issued.

In Great Britain television broadcasts are used in schools very much more than sound broadcasts, in spite of the fact that there are far fewer schools equiped with television than with sound. With the aid of grants from the Carnegie United Kingdom Trust and the Ministry of Education, the Council for Nature organizes a Conservation Corps of young people who offer voluntary help in the manual work necessary in the management of nature reserves and other biologically important sites, which the owners have been unable to tackle with the means at their disposal, and which must be done. Typical tasks include clearing scrub and undergrowth, uprooting small trees, the making of footpaths, digging out and planting vegetation on the banks of ponds. At the same time volunteers are given talks explaining the purpose of the work and lectures on various aspects of the natural history of the area. The young men and women volunteers for the Conservation Corps come from all walks of life, but so far mainly from public and grammar schools, universities, training colleges and the Scout and Guide movement.

The Netherlands The instruction given by the teachers during elementary education is the pivot on which everything revolves. This depends largely on what tuition is given in biology at training colleges. In the Netherlands in general this tuition is extremely limited and in addition is often given in such a way that all interest in and appreciation of this subject is nipped in the bud. Any desired improvement would necessitate more scope being provided for this subject in the curriculum of the training colleges, with a program aimed at promoting understanding of the importance of the natural resources and their conservation!

At the secondary schools the situation is more favourable in that biology has a permanent, although too limited, place on the curriculum and is taught by specialists who, in view of their university education, can be considered to have understanding of this matter. A worthy possibility in the direction of out of school work is the institution of working weeks in various schools. In general the emphasis will be on the didactic and social aspect of this work. The working out of a project such as "The scenery in the environment" where the working week is spent in considering the human and other biotic factors affecting it might nevertheless provide opportunity for devoting attention to questions of management and conservation of nature reserves.

To instruct students in this matter and so contribute to a proper appreciation thereof as a part of their education the emphasis will be on a working period at a Biological Research Station, of which several are available in the Netherlands. This is not only important for the biologists, but also for the agriculturalist and the forestry expert.

The periodical "Nature and Landscape", of the Contact Commission for Nature and Scenery Conservation, is a medium for the exchange of experiences and the provision of information. Besides this the magazine "Nature and Man", which appears five times a year, is a medium for propagating the concept of nature conservation and is devoted to man's behaviour in nature.

The Institute for Nature Conservation Education (I.V.N.) has been formed from the wardens of the Association for Nature Conservation, established in 1939. In this association the duty of nature wardens is to prevent destruction being caused to nature reserves as a result of irresponsible behaviour on the part of visitors. Although this work in itself proved useful, the view gradually gained ground that merely to forbid and warn people was not sufficient and that instead far more attention should be devoted to educating them. It was this view that led to the reorganization of the Association of Nature Conservation wardens. In 1960 the Association was changed into the Institute for Nature Conservation Education, with the following aims:

a) to arouse and promote interest in nature and scenery, and to convince the public of the need to make proper use of nature and scenic beauty,

b) to prevent and counter the destruction or defilement of nature and scenic beauty by the action of others.

The I.V.N. endeavours to realise these aims by organizing excursions (nature walks), issuing leaflets, appointing nature wardens, and having nature guides trained and made available. Nature Conservation work camps were organized as an essential part of the I.V.N. national operations. These camps may be compared with the Conservation Corps organized in Britain. The interest in these camps is so great, that dozen of youngsters had to be turned down.

The Netherlands Youth League for the Study of Nature, which was founded in 1920, wants to propagate love for and knowledge of nature amongst the youth of the Netherlands. To the members of the organization no requirements are made concerning political or religious opinions. All Dutch boys and girls are welcome in the organization. The only limits are those of age. One has to be 12 years of age to become a member, whilst, having reached the age of 23 years, one is obliged to leave the organization. It is important to point that the General Committee is also bound by these age-limits.

In the Netherlands there is a method by which teachers can improve their conservation knowledge. The annual Biological Working Camp for Teachers, organized by the Royal Netherlands Natural History Society, is very popular. The participants of this camp are teachers, biological students and members of biological societies. At the same time a group of very good specialists is invited. The aim of the camp is to broaden the biological knowledge of the participants. The camp also provides an opportunity for contacts between teachers and biologists.

In the Netherlands several societies are engaged in out-of-school education. The kind of people they reach may be different but the object they pursue is, generally speaking, the same, i.e. to enrich the knowledge of man, to bring man nearer to the treasures of his culture and to stimulate his notions of responsibility in relation to nature. Societies working in such a way are for example, University Extension Classes in most of the larger towns. They aim at the cultural education of adults by means of lectures, courses, excursions etc.; and regular courses are also broadcast. The Society for General Benefit, an institution more than a hundred years old, works by means of a great number of departments established in the country, the villages and the small towns. The broad lines of the work are the same as those mentioned above. Folk High Schools are different from the University Extension Classes. Groups of adult pupils are for some weeks together in the colleges. The aims of the Dutch Institute for Working Class Education has in general the same aims as the above mentioned. The subject of nature conservation education is only a subdivision in the field of cultural and social subjects of all these societies. Nature trails have an enormously increasing popularity. Two years' experience has taught that older and younger people, pupils of the schools and members of the youth organizations are brought into very good contact with nature by visiting the nature trails. Here the most important benefit for everybody - other than walking under the supervision of a leader - is to do it on one's own. Everybody has to be continually active and so the contact with nature will be all the more intense and valuable.

Norway At the universities (Oslo and Bergen, and the university college of Trondheim) the teaching of biological and geological subjects goes on much as before, with indoor courses and field work. A few years ago the Palaeontological and Geological Museums of the University of Oslo appointed as a new member of their staff a museum lecturer. In addition to helping the public, and particularly schools, to profit as much as possible from visits to the museums, he has made up small trans-

portable standard collections to be lent to schools. He has arranged geological nature trails in the vicinity of Oslo. The student's associations at the Royal College of Agriculture, Horticulture and Forestry (at Vollebekk) have arranged a round-table conference on the relation between conservation, urbanisation, practical forestry etc. At the Royal Institute of Technology and Architecture (Trondheim) the department of architecture has arranged a symposium on regional planning, with a whole day devoted to conservation of nature.

In the primary schools in the 4th to 7th grades two entire days every year are devoted to field work to study plant and animal life and to collect material. In the secondary schools altogether four days are devoted to excursions and field work during the first two years. The school excursions are mostly used for botany with emphasis on floristic knowledge, while study of the fauna, and, still more, ecology, is often neglected. Some teachers however are very good; they choose areas with widely different ecological conditions and give the pupils tasks individually or in small groups, which stimulate their interests and activities. In the summer of 1962 the Norwegian Country Youth Club Association (4H) arranged a month's field course for various biological and geological subjects, with the conservation of nature as a leading idea.

A nation-wide, one-and-a-half year drive for naturvett came from energetic and interested members of the Norwegian Hunting and Fishing Association and the Norwegian Touring Club. Vett = understanding, common sense. The meaning is that one who has naturvett knows how to behave in relation to nature: the aim is education in nature conservation in the broadest sense of the word. The leaders of the drive carry out the program in many different ways; press, radio, television and other organs of mass communication have shown great interest and support. Posters have been put in schools, post offices and other places all over the country. Short films, filmstrips, booklets and other material have been distributed to schools and clubs. The whole action has already shown good results.

Sweden In the first 7 years of the Grundskola nature conservation matters will be dealt with, as well as respect for nature, flora and fauna. In the seventh year nature conservation will be taken up from a general point of view. In the 8th and 9th year no instruction in this matter will be given. However, supported by the organization of the teachers in biology, Svenska Naturskyddsföreningen has taken the initiative to bring nature conservation education also into the highest classes. To stress particularly the ecological connections, this instruction must be given in connection with excursions. Meanwhile problems of game management, landscape planning and man's responsibility for nature ought to be included. Owing to reorganization of the Grundskola (elementary school) the 9 years course for pupils commencing at the age of 7 years will be continued in the Gymnasium for 3 years. The Gymnasium (upper secondary school) covers the age from 16/19 years, and pupils have to pay special attention to the ecological circumstances and man's behaviour to natural resources.

At the universities certain aspects of the aims and means of nature conservation are dealt with and some nature reserves are visited.

At the Royal School of Forestry lectures and excursions are given on forestry, nature conservation and landscape preservation. At the Military College School, two lectures on "The Soldier and Nature" are given. At the Royal Gymnastic Institute there are three lectures on nature conservation and open-air life, with one day's excursion. At the Royal Institute of Technology special attention is paid in architecture to landscape planning, green-belts and nature conservation. Here landscape conservation is dealt with in the study of roads and hydraulics.

In the past years Svenska Naturskyddsföreningen has produced a great deal of information and propaganda concerning conservation education; consisting of books, pamphlets, placards, films and colour slides. Of the books a description on protected plants and animals can be given special mention, together with the description of various nature reserves and a series on National Parks. In Sweden radio and television produce good nature programs, containing something about nature conservation, and school broadcasting and television also have a special conservation program.

With these examples of conservation in several countries of Western Europe, I have tried to give you an idea of what has been achieved up to the present. I gathered the material for my lecture from information I received from several contacts in the countries I have mentioned. From other countries not mentioned; insufficient documentation has been available; however, if it had been available I wonder if there would have been sufficient time available during this Workshop!

In the coming years the Permanent Commission on Conservation Education with its regional groupings will carry on the survey of the problems concerning conservation education in the different countries.

I thank you all for your patient hearing.

J. Goudswaard

JG:Id'AA

Experiences and Objectives in Conservation Education and Propaganda in Countries of Africa

by
M. K. Shawki
Member, I. U. C. N. Executive Board

It was only on trying to acceded to the request of ourChairman (of the Education Commission of the IUCN) to address you on this subject in this Conservation Education Workshop that I came to realise how very little work has so far been done on it in Africa as a whole and how very limited experiences on it are. Apart from a few scattered amateurist efforts using adopted rather than adapted methods and approaches, little indeed has been done in the field of Conservation Education and propaganda in Africa. But this situation is a relative one and our shortcoming is a matter of degree as I believe Conservation Education tends to be backward all over the world compared to the need for it and to advance made in the fields of public education and information and to the methods and techniques available nowadays for that.

In my experience use, misuse and abuse of natural resources and the neglect of the basic rules of conservation which we define as rational use, are not a function of poor and economically less developed societies. It is practised equally and perhaps to a greater degree by prosperous communities in lands of plenty and abundance. The main difference is that the results are less manifest in the latter case. It is not true that man needs first to satisfy the pangs of his immediate hunger before he is elevated to the quest of nobler causes and higher goals and the attributes of the finest human qualities of justice, honour, sacrifice, self denial and the pursuit of the long term indirect values such as conservation of natural resources for his own benefit and that of his fellow men, and for generations not yet born. So it is that despite poverty, ignorance and disease and the other ailments of the long subjugated peoples of Africa on whom freedom is just dawning, conservation principles and practices have every chance of being applied if only scientists, planners and executives decide on the correct thing to do and proceed to do it and arrange for the masses to be informed and guided in the path of conservation. Examples of African traditional conservation practices hardly need to be quoted here.

In fast developing modern states, renewable natural resources of flora and fauna are particularly vulnerable to misuse and depletion due to their being basic factors in production and because of the economic and social set ups in developing countries. The greater dependence of our development programs is on natural resources and our modes of land use tend to be generally backward. In the very justifiable urge for quick development, the necessity for conservation of natural resources is too often overlooked in our plans, whether financed from our own public or private sources, or by international or bilateral loans and aids.

Conservation is particularly important in countries of a tropical climate in which a considerable proportion of the land is lifeless desert, with much of the rest subject to a fluctuating and unreliable rainfall, and the balance of nature is very delicate. Unheeded destruction of vegetation exposes the land to the unmitigated force of desiccating winds and torrential rainstorms, and this is true whether the vegetation is destroyed deliberately for development, without proper safeguards, e.g. unilateral agricultural schemes, or if the destruction is caused unintentionally by the effects of over-grazing, unregulated cutting of trees and uncontrolled fires. Even in the wetter areas the continued effects of fires and unmanaged shifting cultivation are steadily reducing the fertility of the soil. The fertility of the soil of a country is its greatest natural asset; it is important that this be maintained on a permanent basis and not dissipated.

Conservation of the country's wild life is also of the utmost importance. In addition to their scientific interest and attraction to tourists it is now realised that in many parts of Africa wild animals are a more certain and more productive source of meat than are domestic flocks and herds. And apart from its effect on soil and microclimate, the vegetation is worth conserving for its own sake. Trees which are burnt in forest fires or killed, as seedlings, by grazing animals, cannot be used to supply timber and firewood; if grass is burnt, it cannot be eaten by stock. All these factors render natural renewable resources of forests and wild animals vulnerable to over exploitation, misuse and depletion, while, unlike mining, they need good management to provide a sustained yield in perpetuity. It is not often realised how essential such management is, particularly to fast developing countries. Unfortunately the indirect benefits accruing from conservation which form a considerable proportion of their total benefits, cannot often be appreciated by the populace nor fully evaluated by naturalist and expressed in figures and introduced in the famous formulae of economists.

Although legislation for conservation is useful and often essential, legislation by itself can achieve relatively little unless it is backed by public opinion. Although laws may exist to prevent, for example, indiscriminate burning, they will be largely disregarded unless the public realises the harm that is being done by these fires, and unless people themselves both refrain from starting fires and actively assist in the prevention of offenders. This public awareness of the importance of conservation can only be achieved by means of publicity and the provision of information, and this publicity must be directed to all levels, from the children in the elementary schools (including the girls, the future mothers of the nations) to the administrators and legislators themselves. There is great need for an intensive campaign of information and mass education on principles of proper land use and conservation of nature and natural resources to counteract adverse factors of depredations; such an education and information campaign should cover the whole spectrum of society. We need to reach the common man and instruct him on the rules and ethics of forest utilization and game hunting and shooting, and we need to

reach the high executives who decide on national development schemes and whose job it is to manipulate diverse projects and integrate heterogenous foreign aids and technical assistance programs.

It is thus hoped that conservation education staff are added to all forest and game management national organizations. Their duties will be to awaken the public conscience to the need for conservation of all natural resources by means including the following:-

1. Arranging school and public visits to national parks, forests and natural reserves.

2. Inclusion of Conservation in the regular school curriculum.

3. Preparation of press releases, articles for newspapers and periodicals, and radio talks.

   Organization of a Forestry and Natural History Museum and collecting materials for it, to form displays to illustrate the importance of conservation, such as can be shown to school children and others.

4. Organization of material for mobile shows; a good example of the kind of thing required is the Mobile Forestry Exhibit in Ethiopia, described in Unasylva, vol. 14, p. 125.

5. Planning films to illustrate the importance of conservation and arranging exhibitions of such films.

   It would also be desirable if equipment is made available to them, such as:-

   Still Camera and Dark Room Equipment

   16 mm. Cine-Camera

   Vehicles, equipped with generator, for transport of mobile exhibits and organization of mobile film shows. Also vehicles for experts and counterparts.

It is considered that by these means a very great deal could be achieved in furthering the cause of conservation.

M. K. Shawki

MKS:Id'AA

Ecology Field School
Washoe Pines Ranch
Nevada, 1963

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by
R. G. Miller, Foresta Institute for Ocean
and Mountain Studies

Film Narration:

These children are taking part in the summer field school, learning environmental science. With us they are going to look at our environment and see how one organism relates to another and to the physical conditions. This is our course in ecology. We believe that children are capable of this study and that they should have it at an early age.

Here is Kirk from San Carlos, Eric from Washoe Valley, Martin from Los Angeles, Trent from Reno, Greg from San Jose, Maya from Pasadena, Gary from San Jose, Annie from Washington, D.C., Gloria from New York City, Trea from Pasadena, Laurie from New York, Frances from San Francisco, Betsy from New York, Kit from Washoe Valley, Dave from Newport, California, Jim from the ranch next door in Washoe Valley, Bob from Carson City, Charlie from Berkely, California.

These children have come together for the summer of study in W estern Nevada at the foot of the Sierra Nevada range. Here the mountains are cool, the desert is hot and the moisture comes in from the sea over the Sierra Nevada forming high clouds but little precipitation through the summer. The snow of the winter lasts into June forming wet places in the meadows and a few high cirrus clouds.

At Washoe Pines Ranch each summer Dick and Maya Miller take 20 students for six weeks of study and play. Their staff consists of Chief Science Instructor, Jim Conkey; Nancy Ravin in charge of arts and crafts; Mary Rheuben in charge of horsemanship; Bill Franklin in charge of horses and boys; his wife Merry, expert cook; Rob Robertson, botany and boys; Suzanne Hessimer, swimming and girls; John Nevers in charge of plant and equipment; and Janice John, household manager.

A few more teachers are the animals. Nature is the teacher at Washoe Pines. These are mule deer, also kangeroo rats, a crow, there were ravens and a blue jay and a net squirrel, a collared lizard, and even those who come at night and are difficult to see except when we hold them over for the daylight: a porcupine.

But we also have more normal studies. Here Jim is giving the daily morning lecture which follows chores and breakfast. Jim is telling about the animals of the mountains and the effect upon them of the climate; how they depend upon everything in their environ-

ment and how the whole pyramid may be upset when things don't go right. We go into the field with equipment of our own making to study animals and plants, make observations, study inter-relationships. Soon we will be using our home-made live traps in the desert, the meadow and the forest. Jim tells us how we can learn from trapping scientificly and systematically, finding thus the distribution of animals, each in itw own niche; and the study of the life zones. Various equipment is used. Even such things as the sextant which is known to navigators but useful to explorers anywhere.

Guests come in to tell us the history of explorers and mountain men coming into the country. And we do our own exploration, first, in our own meadow and orchard to study the grasses. We refer to the books. We have an excellent one for our area. The Sierra Nevada by Storer and Wsinger. And with these aids we begin to understand our environment.

The aquatic situation is not ignored. Frogs and tadpoles are important. Sometimes the night visitors leave their mark. And Gary and Trent are finding whirly-gig beetles and others of their kind.

We are learning how to know better the creatures that live above our heads and beneath our feet. New things bring out various reactions, expressions of activity.

We can be more analytical as well, and we examine the community by sampling. Here the boys stand at corners of their test-plot within which everything is scrutinized, even where the log lies it is important to find if life is beneath it. Martin has already found some nesting material and here is a tooth probably carried there by a small animal. An electronic thermometer is one of our instruments for being precise in our measurements; for measuring temperatures beneath the soil, and at the surface, and in the waters. And in the woods we try to determine how old the tree stand is. Is it invading the meadow or is it being invaded? Each bit of information is pooled and comparisons are made as the basis for our conclusions.

Some plots are laid out in the open meadow. Notes accumulate. There is a report to be made and here Laurie and Trea, and now Frances and Betsy are telling what they have found on the banks of the stream and in the grasses of the sandy hill on which they sit. One of the inhabitants of their plot, a small garter snake, is looked upon more closely. Another plot yielded a larger specimen, its labials are examined, and scale rows along his back. These help to give a precise identification.

The Yellow-Legged Frong of the Sierra also is found in the literature. Grasses and other pasture plants are kept.

In another site we gather to lay out our traps, in a study of the animal population, as Jim has described it. At dusk along the transect line the traps are laid. Care is given to situation and for baiting, and after a night of sleep along the shore of the lake the

children will be out early in the morning to reap the harvest. Here a kangeroo rat is a small prize in a big trap. And other kangeroo rats show that here the environment is ideal for their kind. Other stories are to be told, the story of ages ago of the sea bottom where a rain of plaktonic debris formed layer upon layer of diatomaceous skeletons entrapping the forms of larger things such as fish. Here re-opening the pages of these books the children find the story of Pleistocene life and environment. Today's wind recirculates the plankton that has lain fossil since ancient seas receded. The wind also had carried old sea beaches up into dunes, relics of an ancient sea. Here the present invaders are salt grass, and other xerophytes searching for moisture. One wonders how far down they must go or if they really can have any moisture in them. The children themselves as organisms feel the impact of the climate as they come down off the sand dune exhausted and dehydrated.

They camp out on a mountain outlook in the desert, each becomes a proficient camper. There are camp duties and eating and exploring and climbing on the rocks to occupy us here. Here the class is hearing about and viewing the sinks of two great rivers which rise in distant mountains and end here in the bottom of the basin far from the seas. From these heights one might have witnessed a procession of explorers, Ogden, Kit Carson, Captain Bonneville, and then thousands of canvas-covered wagons. Century old relics lie in fragments here on the Forty-Mile Desert.

There are publications on the desert phenomena also, one on ancient man leads us to a site where petroglyphs may be seen. Messages which are still cryptic but abundant in this tumble along the crest. They are all about on this desert ledge suggesting that here was game and here was time for meditation and creative art and for the making of tools. Wonders of nature cannot be overlooked; in this roadside geyser we study the deposition taking place in the hot spring formation. Later in the cold waters of the mountain lake the young explorers see life beneath the surface following the same ecological principles they have observed elsewhere. Other observers express themselves artisticly. And further exploration up the mountain trails to the sources of the water to the high altitudes, 8,000 feet and 9,000 feet above the sea where the water is fresh the days are cool and life is in its vernal season, where snow lasts throughout the summer. Worms and naturals are tried to test the fish population and some inquisitive minds go higher to study the trees, the birds, weathered logs, the flowers, the snow fields, and to find the crest.

It is important to visit the fire towers, as a measure in forest protection and Peggy the fire lookout tells us how fires are spotted and reported so that men may be moved in quickly to stop the fires.

Back in Washoe Valley there is much work to be done at the camp. There are crafts which pick up the objects we saw in the wilds and show the detail and improve our acquaitance with them, making them

friends, the grasses, the rocks. There is inspiration in the landscape for drawings: in the landscape, in the barnyard, in the high country. Nancy helps us to see the familiar objects with an artist's eye. Mountain lakes inspire scintillating collages of glass. Petroglyphs inspire clay work of totems, medallions, beads, pottery, and totem poles. California redwood and local fresh cut Quaking Aspen are inviting to the carvers of images. These stand as monuments to the inspiration of a child.

Some of the casualties of the neighborhood are made up into museum study skins and these are useful for a reference in the future. We trust that these intimate moments will make for us lasting impressions of our fellow creatures. For the young ecologists, meadow mice, chipmunks, red squirrels all help to build a body of reference.

In the afternoon Wuzzy George of the Paute tribe comes to class to show how an egg basket is woven from green reeds. We cannot use the basket for collecting eggs of wild ducks as her people did. The reason we as a school follow her with interest is that she represents a culture which through the ages had adjusted to the demands of its environment. We are learning some of the satisfactions and the pleasures of this adjustment. Hot coals are tossed in a winnowing basket with a handful of nuts from the pinon pine tree. The coals glow, the nuts are roasted, but the basket does not burn. Later the shells are removed and the kernels are to be placed on the metate for grinding. The nuts then go to the metate and are ground into flour. Pine nuts are a confectioner's delicacy, but for the Paiutes, the Washoes and the Shoshones, they were once a staple, a way of living off the products of the desert-mountains. From these they made a porridge, a cake, a sort of pudding, or pine nut butter. This batch did not get beyond the pine nut butter stage. The bread-making has its modern counterpart for the children.

High point of the summer was a trip to a National Park. This year it was Lassen Volcanic National Park where the children met a naturalist on a tour of the nature trail. They learn how he interprets the natural scene for the enjoyment and enlightenment of the visitor. Along Manzanita Lake observing a throng of lady-bird beetles, seeing the twist that identifies a white fir.

The inspiration of the national park is carried home to be emulated. It is put into practice on a self-guiding nature trail. Each child takes the assignment of a subject to be studied and developed for identification by an unaccompanied hiker. At each station this visitor may read from his guidebook an interpretation of what is there.

Thus in six weeks our students are transmitting their ecological understanding. These children know that the principles they have observed in effect here will be seen at work again in other communities. They know that many ecosystems will be lost as man adjusts his environment to himself. They know that development of nature to man's ways needs a constraining hand. What they know will be important in their country's future.

R. G. Miller

RGM:Id'AA

The Role of National Parks and Reserves in Conservation Education and Propaganda of Ideas of Nature Conservation in the Countries of Africa

by
W. H. Eddy Jr.
(New York Zoological Society)
Education Officer,
Tanganyika National Parks

Summary

The purpose of this talk is to explain in detail the type of conservation education undertaken by the Tanganyika National Parks in the past two years. This material is presented in the hope that the techniques which have been developed in this area may have their application to other countries of Africa facing similar problems.

The talk will be divided into two parts:

I. (30 minutes) A discussion of methods devised to:

A. reach larger numbers of people unable to actually visit conservation areas or National Parks. This will involve the discussion of

1. posters
2. brochures
3. films and film unit.

B. reach a more limited number of people who may be brought to visit Parks. These consist of those people in

1. secondary schools
2. tribal councils
3. political office.

This will involve a description of the program developed in Lake Manyara and Serengeti National Parks and will cover

1. selection of groups
2. hostel use
3. museum program
4. essay program and awards.

II. (27 minutes) The showing of an educational film "Safari to Lake Manyara". The film tells the story of three Tanganyikan school boys who were chosen to visit one of their National Parks. It illustrates the point of view taken initially - that conservation and conservation material must be oriented in a frame-work of enjoyment and personal experience.

W. H. Eddy Jr.

WHE:Id'AA

Resume of the Workshop on Conservation Education Papers

by
J. Pile
Natural Resources Board, Southern Rhodesia

To summarize the papers presented over the past day and a half is no small undertaking. However I will do my best.

The papers presented at this workshop of Conservation Education may for the sake of clarity be divided into two parts. In the first group there are those that deal with scientific aspects and problems in relation to the conservation of nature. Together with these can be grouped the international significance of national parks and the role of nature conservation in the economic, social and cultural life of the society.

In the second group we have had a series of papers outlining Conservation Education techniques, covering a wide cross-section of countries throughout the world. United States, countries of Eastern and Western Europe and finally Africa.

Every paper presented has contained a vast amount of most valuable information of value to advanced countries to enable them to evaluate their conservation education programs and to introduce new ideas, for the emerging states they will prove invaluable guides and the best and proved techniques adapted to their own requirements for developing conservation education programs.

You have been talked at for the past day and a half and we have now reached the time for discussion, and I have no doubt that all of us have many experiences to relate which will be of value to this Workshop together with numerous questions and points for debate. I therefore have no intention of endeavouring to comprehensively summarize all the papers but rather to enlarge upon some of the points made which may assist in the general discussion which is to follow. Professor J.-G. Baer drew our attention to the fact that the down-grading of man's habitat started with the beginning of man and the process of down-grading has continued at an ever-increasing rate. We know, however, that if we use our natural resources unwisely we shall destroy them, but more important is to know how to go about reversing this trend and one of the objects of IUCN is to show how this can be done. The problem while being both complicated and difficult is nothing new, the position was known to be getting out of hand by the Middle Ages, and Professor Baer pointed out that IUCN could use to advantage the bad examples of Western Europe to avoid the same happening in the emerging African States. He laid particular emphasis on the importance of national parks which he described as the basic repositories where we can learn to conserve nature - to use it without destroying it.

He laid stress on the fact that conservation must be integrated into our way of thinking and that the emphasis must be on the children where there was a need for thorough basic training in natural science in the field and not so much from books, and here again national parks are all important.

In order to continue the national park theme I now refer to the paper by Dr. Coolidge. He referred to three papers presented at the first world Conference on National Parks in Seattle last year dealing with education in relation to national parks in the United States, Southern Rhodesia and Japan. I think of particular interest in relation to the importance of national parks in conservation education was his reference to the paper by Tetsumaro Senge which shows how the national parks in Japan are used for study tours as part of the regular curriculum for school children. In 1959 a total of 45,000 schools had school journeys involving more than 5,000,000 children and five national parks were among the best 10 destinations for these tours. In the small heavily industrialized and populated country national parks are indispensible to study geographical features, geology, ecology of animals and plants. The day a country in Africa can claim that 5,000,000 school children have visited its National Parks will indeed be a great occasion and achievement. Dr. Coolidge maintained that natural beauty is the highest common denominator in the spiritual life of mankind and that we should stimulate especially at the elementary school level a back to nature movement. If this can be achieved then the children in elementary schools will not only have a basic understanding of, and reverence for, the natural world of which man is a part, but they will hopefully take a greater interest in solving problems of stabilising the natural environment and the biotic community that is dependent upon it for survival.

National parks are, he said, a natural area for schools and colleges to visit in their nature study courses. This I think is the most important point. For if national parks are to survive in Africa they will not do so if they are solely the prerogative of rich tourists and the "haves" of the local community. They must be a part of the nation and play a part in developing national pride. National parks should also be a priority for teachers of conservation in schools and colleges. They must have a dedication to the cause to enable them to inspire interest in this new subject.

We have also had the opportunity during this Workshop of hearing papers dealing with United Nations World List of National Parks and Equivalent Reserves by J.-P. Harroy, and the Projected Park Systems Planning Program by Dr. W. Hart. I only now mention them and do not propose to attempt to summarise. We now go on to the more scientific papers.

Firstly to the scientific aspects of conservation education by Dr. Edward Graham. Referring to the study of nature he said that we particularly need to re-examine our ideas of dynamic process in nature, for these ideas have strong influence on conservation thought and philosophy and upon what we do with the natural resources available

to us. He made reference to the thought that until the European came to North America, the forest vegetation flourished in the climatic condition to great productivity. Man was considered to be the primary influence of vegetation. However scientific study has revealed relationships, interactions and historical perspective which has shown that man is but one of the factors constantly effecting vegetation: wind, fire, ice, insects, vertebrate animals, weather and other non-human factors, are all in one way and another and at various times constantly modifying plant growth. In this most interesting paper Dr. Graham brought out the most important point which is of significance to all countries and particularly, I think, to the continent of Africa. This is the need for rational guides to land use and development among the new nations, where land is being put to intensive use for the first time, so as to avoid costly mistakes in the choice of sites for specific types of use.

He quoted an example from the United States which shows that the national population increased from 132,000,000 in 1940 to 182,000,000 in 1960. Contrary to what might be expected, the number of farmers who provided food and fibre for these additional millions of people did not increase during the 20 years but decreased from 30,5 million in 1940 to 15,6 million in 1960. In other words the farmer in 1940 supported 11 people, in 1961 he supported 27, due entirely to the increased efficiency of American agriculture, i.e. not only did the number of farmers decrease but so did the acreage devoted to cultivated crops. The acres once under crops have been converted to grass, trees, wildlife habitat, and, more recently, to recreation areas.

In the paper on Conservation of Fauna, Dr. Dementiev drew attention to the fact that there is no contradiction between the "economic" and the "protective" points of view in relation to conservation, and that according to modern concepts conservation of nature relies upon a reasonable system of natural resources utilization: thus in essence conservation of nature should be mainly based on exploited economically important objects, in other words they should be both protected and used to advantage. He dealt with the conservation of animal species by what he referred to as "artificial" methods, such as domestication, semi-domestication and zoological gardens. But we also have convincing examples of the possibility of conserving species of animals in their natural conditions. In cases where wild animal species have suffered from man's unreasonable activities, not only have many species been conserved but they have recovered to the extent that they have already acquired economic importance.

Lt. Col. Boyle gave a most excellent paper on the problems of protection of rare species of animals; appealed to those dealing with Wild Life management and game cropping to give consideration to the preservation of predators and reminded us that if the work of management is to remain in the field of nature and not become just stock raising, the predators should receive as much protection as their prey. None of the large predators are in fact in danger of immediate extinction but all are becoming rare enough to need protection. He also dealt with many other aspects of protection such as the meaningless international agreement on the blue whale, of the over shooting of caribou,

the danger of ladies fashions creating a market for the plumage of birds, and many other aspects; but I think as far as wild life conservation problems in Africa are concerned his reference to predators is most pertinent.

I would now refer to the paper and film presented by Mr. Eddy of Tanganyika National Parks. It was perhaps unfortunate that this should per force have been presented in the evening when some people could not attend. I say this because Mr. Eddy has been the only one so far to present his lecture on the lines of a true workshop. I think those who attended would agree, and to those who were unable to attend, I can only say it was their loss.

We now come to the group dealing with conservation education techniques in the various parts of the world. As was to be expected these covered nearly every aspect of conservation education. Each one of these papers should be carefully analysed by all those responsible for conservation education programs. For contained in them is the basic frame-work which can be adapted to any circumstances in any country. However I would say here that while the papers are most comprehensive, for the purpose of this or any other Workshop, it would have been better if they had been talked to rather than read; the speakers high-lighting the various projects referred to in their papers and explaining how they could be applied by member delegates of this Workshop, to be followed by discussion. I think Dr. Shawki's paper high-lighted this fact and in his opening paragraph he drew attention to how very little work has so far been done on conservation education in Africa as a whole apart from what he terms a few "amateurish" efforts, using adopted rather than adapted methods and approaches. He said that Africans are in fact losing the trend of conservation, they are gaining Western Culture but a Western Culture minus conservation. Conservation is particularly important in countries of a tropical climate in which a considerable proportion of the land is lifeless desert. He felt that although legislation for conservation is useful, legislation by itself can achieve relatively little unless it is backed by public opinion. This public awareness of the importance of conservation can only be achieved by means of publicity and the publication of information. He drew attention to the adverse influence of assisted implementation of badly managed/planned development schemes, i.e. bad distribution of bore holes and wells, etc.. It was, he thought, imperative that an Education Unit be set up in Morges, and that advisory visits be made to countries to assist them with their conservation education problems and the introduction of conservation education into Educational Institutions and Teachers Training Colleges. He also called for conservation education staff to be added to all forest and game management national organizations, to arrange school and public visits to national parks, forest and natural reserves. To encourage the inclusion of conservation in the regular school curriculum, the preparation of press releases, articles for newspapers and periodicals and radio talks, and other aspects of conservation education public relations. I think in actual fact that much more is being done in Africa than Dr. Shawki realises, but I am not at all surprised that he is unaware of what has been going on, and I would take the opportunity of referring to some remarks I made at Seattle last year when, having

outlined a wide range of public relations techniques already in use in Africa, I said that I did not doubt many of the projects outlined are being practised in many countries in Africa in some form or other, "but is it not about time that we get together to help one another in a common cause. There is a great need for more co-operation and liaison co-ordinated by a central organization such as IUCN with, I suggest, a regional committee and possibly an advisor or co-ordinator making regular visits to each country within the region to deal specifically with Conservation Education matters".

J. Pile

JP:Id'AA

Discussions

At the opening of the discussions the Secretary of the Commission on Conservation Education, Mr. J. Goudswaard, replying to a question by Mr. Tahwawa (Coryndon Museum, Nairobi) on whether it would not be possible to use various IUCN publications as conservation education material for schools in Africa, said that the question of re-printing appropriate IUCN publications was a matter of finance, which was beyond the present scope of the Commission, but that a book by Professor Engelhardt, due to be published shortly, would be of the greatest use to everyone interested in the teaching of conservation in schools.

2. On 13 September Dr. E. P. Dottrens (Switzerland) led the discussions. During these there arose the question of whether European methods of education in Africa had resulted in a loss of valuable local knowledge, which had been accumulated over many generations. It was generally accepted that this was partly true with regard to the traditional use of natural resources; and because of this it was felt that special efforts were required to prevent the disappearance of such traditional knowledge.

3. With regard to National Parks, the creation and maintenance of which did not appear to anyone at the Workshop to be in contradiction with the frequently expressed need to profit by the wise exploitation of the available natural resources, especially in those countries faced with serious economic and demographic problems, it was considered that if established on scientific and sure ecological foundations they were clearly justified. Because of this it was important to convince the local population of the immediate and future value of the vast natural resources which were available. Also, when considering the educational value of National Parks, the Commission on Conservation Education proposed that IUCN should do everything it could to promote ease of access to such parks; or at any rate to those Parks which would be of particular value in arousing public opinion in support of conservation. It was also considered that problems of utilization of natural resources, particularly in countries of heavy population pressure, should be systematically integrated with all education programs on nature conservation. Mr. D. R. M. Stewart, Kenya Ministry of Natural Resources, voiced the opinion that National Parks were a necessity and not a luxury.

4. On the subject of the dissemination of information on nature conservation Mr. J. Pile, while agreeing with the importance of National Parks in the overall concept of conservation education, said that the trouble was that they only constitute a part of the whole picture. He felt that the main problem today, experienced by emerging African States, is how to organize their conservation education programs; and he considered that it may help the Workshop therefore if he could outline an example of one approach.

It is a fact that within each country is a wealth of conserva-

tion knowledge. The technical officers of the Departments of Agriculture, Water Development, National Parks, Forestry, Wild Life Conservation etc. are all aware of the problems and what can and should be done, they are also aware of the importance of conservation.

The question is how to organize this knowledge and experience to make it available to teachers, who are or should be the people trained to pass this on to their pupils. In addition it is essential to make the Ministries of Education and the teachers realise the importance of including conservation education at all levels in the school syllabus.

It was necessary first to appoint a National Conservation Education Committee of the men responsible for policy, i.e. from Education, Agriculture, National Parks, Wild Life, Forestry, Youth organizations etc.

At this level priority and direction on conservation education can be formulated, and perhaps a sub-committee formed to study methods of other countries and report back with suggestions as to which should be adapted to suit local conditions and how.

Downwards from there, though not necessarily downwards in importance, similar committees should be formed in the Provinces/ Regions and again at District/Area level. Included on these committees should be representatives of Parent Teacher Associations. At all these levels, first courses can be organized during vacations, and outings and lectures at the weekends; all designed to show the problems of conservation and to explain how they can be introduced into the school classes.

Following this will come suggestions from all levels, of how conservation education can be taught, and in this respect technical officers can prepare a list of reference works available and the names of people who can be consulted in each Province/Region and District/ Area.

Once some organization along these lines has been started, the basis for a Conservation Education program will have been laid in an organized and co-ordinated manner.

5. Following Mr. Pile, Mr. A. Adande, the Minister of Agriculture for the Government of Dahomey, expressed the really urgent need for cultural exchanges in matters of nature conservation education, and considered that this might be met by the formation of an international organization charged with the responsibility of disseminating all the information and experience available in this vital field. He added that it was essential that a clear awareness of the necessity to conserve natural resources should be aroused at all levels of the population, and that it should also be realised that teaching staff had an essential mission to accomplish.

6. Mr. G. Watterson, of FAO, wished to make his contribution to

the Workshop, but as an individual and not an official representative. His theme was as follows:

"Man has created his own habitat ... indeed, he has given himself a longer life span; - the power to bounce his words off the moon. He has focussed his vision on the edge of outer space and seems unconcerned about keeping his planet a fit place upon which to live. - But he is still dependent upon the natural environment. He must therefore learn to use his natural resources wisely - and here I would add, his local natural resources. For no amount of transport, no amount of migration (even to the moon!) will help the situation with which modern man is faced NOW, at any rate in those areas where it is most acute. I shall be more specific about this situation in a moment.

We thus speak of education - education in conservation - and we have heard of the undeniable value of national parks and equivalent areas in such a process of arousing local interest, awareness and understanding at all levels of a country's population.

A rosy picture of the situation has been evoked in the USA where the values and needs of recreation are recognised and understood ... in a nation with high standards of living and full bellies. But alas, the world, - nation by nation - is not as fortunate as is the US ... for the moment.

There are 10,000 people dying of starvation or malnutrition every day, elsewhere ... and 100,000 new mouths arriving daily to replace them, clamouring to be fed. This population expansion is in its most acute form in areas where, already, the nutritional levels are too low for too many for too long. Economic progress in these areas has been slow, and they therefore face the prospect of having a growing share of the world's people and a shrinking share of the world's output of goods and services. Disparities between the economic and social conditions of these less developed areas and those of industrial nations will therefore continue to widen ... And yet it is in the less developed areas that governments have committed themselves to ambitious programs of economic and social development. It is there that the effort must be made at closing the gap between the 'have' and 'have-not' nations. These areas lie largely in the tropics - the general environment which is the concern of this meeting. And it is the local natural resources of these tropics that must serve as a springboard for such effort ... and the manner in which this springboard is used is clearly of concern to us in discussing education in conservation.

The faster the population expansion, the greater the investment necessary merely to maintain the present unsatisfactory level of output per capita ... the present unsatisfactory standard of subsistence living of so many; - added to which is the fact that population growth in itself hinders the acquisition of the additional capital and skills necessary to achieve greater productivity. And so we have reproductive ability triumphing over productive ability ... and committing suicide. To put it less pessimistically, these areas are going to have to run

very hard indeed, just to keep in one unsatisfactory place. And in this panicky race, what will be man's attitude to the use of local natural resources? (let alone to assisting national parks, or their planning by people who are obviously not among the hungry)?

I am not speaking against parks in the rush to feed the millions. For these areas are not only of value educationally. They are a necessity to our continued cultural evolution - to our civilisation. They answer a growing need of space - in our modern world - unadulterated space - if human culture is to progress; if fruitful use is to be made of leisure; and if individuals are to contribute something to the art of living as men ... rather than as members.

For when resources outrun capacity, a siege economy must of necessity replace freedom and initiative. A termitary or an antheap bears an ominous resemblance to such a necessarily over-organized and regimented society, with its proportionate reduction in useful, creative, cultural output, whether intellectual or material.

You may argue that many of these parks are related to unproductive marginal lands. But who is to say that science and technology will not, of necessity and in the near future, make even the deserts flourish and be productive of food for man?

As I have said before, imports of food cannot hope to provide an adequate answer. Migrations cannot meet today's needs. Nor can flight into space. Even the 20 billion dollars used to put one man on the moon, if used to provide food where it is most needed, would offer only very temporary assistance.

No. The real answer lies in education. And my plea, in coping with this Sword of Damocles, is that we should not only concern ourselves with teaching people to 'read Nature, instead of books' ... we must teach them to read Nature in terms of the numbers of people that Nature, in each of its different manifestations, can adequately support.

Development Decades ... Campaigns for Freedom from Hunger ... self-government and its striving for better standards of living ... so much human hope and endeavour ... make nonsense unless we can teach individuals, communities, and hence governments, to try and relate man's productive capacity to his capacity for conserving and increasing the productivity of the natural resources available to him. Unless we do so - we are building our educational efforts on shifting sand.

During the time it takes to read this, some 1,500 - 2,000 additional mouths have been added to our world population, clamouring to be fed, whilst 200 mouths have been closed in death from malnutrition or starvation. Is this an indication that we should leave off talking about the problem and resort to action instead, by introducing this aspect of resource use into our broad educational programs?"

7. Mr. J. Pile, referring to the vital importance of international

publicity on the conservation of resources, said that, apart from teachers and school children, there is the need constantly to keep the subject in front of Ministers of Governments and the general public in order to create an attitude of mind towards conservation - a conservation consciousness.

Much more could and should be done to give the widest publicity to the work already being done; e.g. by Mr. Eddy in Tanganyika; and the information which had been collected by IUCN. He gave as an example one instance of the use made of one paper, produced by Mr. Thane Riney for the Arusha Conference of 1961, "the Use of Wild Life in Africa", which was re-written for use:-

(a) as radio talks in English and the local languages;

(b) television programs;

(c) articles for the National Press in English and local languages, and;

(d) popular national magazines.

It would have been comparatively easy to make the same material available to similar sources of propaganda in other countries in Africa and elsewhere - and all this from only one paper! Such a program of publicity, carefully organized, could play a major part in assisting the implementation of conservation education programs and give support and encouragement to the many people already endeavouring to promote conservation education.

8. In closing the Workshop the Chairman of the Permanent Commission on Conservation Education, Dr. L. K. Shaposhnikov, drew special attention to the "Review of World Literature on Conservation Education Intended for Educational Establishments" which had been prepared, in English and French, by his Commission and produced by UNESCO, and which was of particular interest to all whose work brought them into contact with conservation education. He thanked warmly all those who had produced papers for and who had participated in the Workshop, as it was their efforts and interest which had contributed so much towards making the discussions so valuable.

Compiled by J. Goudswaard

JG:Id'AA