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The Creation of New Knowledge and Our Way of Life

DONALD J. ZINN, D. PHIL.

President, National Wildlife Federation

The changing tides that are sweeping over our country today are driven by winds that are blowing from every quarter with great and growing intensity; winds that are affecting all of us and virtually all of the things in which we believe.

There are changing tides washing against many of our youth—there is open rebellion on our college campuses—there is growing disenchantment among young people everywhere with the traditions, the moral principles, and the virtues of honesty, hard work, patriotism, and faith in our fellow man—the things in which we believed and the values in life on which many of us were raised.

There are changing tides of political beliefs, of social beliefs, racial beliefs, of observing law and order as if we were a nation in turmoil that had suddenly seemed to lose its way. The Great Society is tending toward a sick society with individual tensions rising in all quarters of our population. It is becoming apparent that more and more, hatred, violence, discourtesy, greed, indifference and apathy characterize what we are told was once a 'land of the free and the home of the brave.'

Someone put it this way:

This is the age of the half-read page . . .
The quick hash and the mad dash . . .
The bright night with the nerves
tight . . .
The plane hop and the brief stop . . .
The lamp tan in a short span . . .
The big shot in a soft spot . . .
The brain strain and the heart strain . . .
The cat naps till the spring snaps . . .
And fun's done.

This seems to be our culture 1968 style. Last year we spent over 200 million dollars for one type of drug—tranquilizers. We take an average of 15 tons of aspirin per day. Every other hospital bed in the United States is occupied by a mental patient, and one in every ten of us is suffering from some type of serious mental or emotional disturbance.

Why has this happened? Why have we become so restless, so angry and so disillusioned?

The eminent conservation leader, Thomas L. Kimball, suggests that the answer lies in an analogy with the well-known behavior of the lemmings—that like every species of wild bird or animal

that increases in numbers until it exceeds the carrying capacity of the land—we have reached a population level in our cities where seven out of ten of us live today, a population level that has spawned an age of anxiety.

But perhaps even more important, is the growing realization that in spite of the facts that applied science and materials technology, that two cars in every garage, that color TV in every living room and all of the other things that have given us the material comforts and luxuries which man has looked forward to ever since he emerged from his cave . . . all of these things are not enough.

And what is more to the point, suddenly we are surprised to find out that these creature comforts have caused our environment to become contaminated and our survival to become seriously endangered. In less than 200 years, we have grown into an affluent society, but we have also turned into an effluent society, where industrial and human wastes are beginning to frighten us if only from their unexpected physical immensity.

The results of cramming more and more people into less and less space are now becoming all too obvious. One result has been filth, disease, noise, frustration, nervous tension and moral decay. Another is crime, chaos, congestion and confusion. But there is more to it than cities crammed with people, automobiles, cement, steel, asphalt and glass.

Just this past year a distinguished task force of business, scientific, public health and labor leaders completed a study of environmental contamination. In their report to John Gardner, who was then Secretary of Health, Education and Welfare, they said: "The danger of the quality of our environment is among our most important domestic problems. It affects all Americans where they live, work and play. The public must learn that air, water and land are limited . . . that the number of Americans is growing . . . that their effluents are increasing at a faster rate than nature and man's present efforts can cleanse them."

Some biologists even go so far as to say that we are burning fossil fuels, that is to say, coal and oil—in order to get the heat, light and energy needed for housing, power and transportation—at a faster rate than the oxygen can be replaced by photosynthesis. This hypothesis has been advanced by the well

known ecologist, Dr. LaMont C. Cole of Cornell University and has been supported by many of his colleagues.

Additional examples of environmental contamination that have been analyzed statistically lend a sense of more personal involvement. For example, during this past year, every American discarded from our offices and homes an average of 1600 pounds of solid wastes: paper, grass and brush cuttings, garbage, ashes, metal, glass and packing material. It included 250 cans, 135 bottles or jars, 338 metal and plastic bottle tops. In all, we in this country threw out 125 million tons of these solid urban wastes last year—and it cost us as taxpayers \$2.5 billion to have someone else pick it up, collect it, transport it and dump it in or on somebody else's backyard or field.

The hidden pollutants of the environment must also be considered. Here the pesticides are a germane example. It has been verified that each of us is presently carrying about 0.1 grains of DDT in our body tissues; admittedly this hasn't made any difference in the general health of most of us. However, the question is how much longer is it going to take before we naked apes show an effect from eating foods, drinking fluids, and breathing air produced in an environment that is being sprayed, dusted or washed with more than 783 million pounds of pesticides each year . . . pesticides manufactured by over 8,000 firms using 500 basic chemical compounds formulated into more than 60,000 different mixtures?

But perhaps most of all we have contaminated our environment with our building. Unimaginative architecture combined with brilliant engineering coupled with an apparently insatiable automotive urge has produced skyscrapers, high-rise apartments, multi-lane speedways, and towering dams—but it has also resulted in the most ear shattering noise, senseless confusion, mental frustration, and unstimulating monotony the world has seen. And from a fish and wildlife conservation standpoint, it has had terrifying and tragic effects. Those who come from states known for the availability of magnificent, fresh or salt-water fishing experiences, realize full well that public demand for electric power, river navigation and coastal exploitation seems to be a formula for failure in spite of nearly herculean ef-

forts to preserve and sustain the fisheries in these areas. Too many dams, too many obstacles, too much pollution and perhaps too much irradiation are a few of the reasons for the great concern that many of the anadromous fishes such as the shad and the salmon may be doomed to extinction.

But so much for the problem. What of the solution?

It is probably most logical to begin with man himself since it is quite obvious that he and no one else is the cause of his difficulties with his environment. I think everyone here can remember 1950 when our population was just over 150 million. In the 18 years following, we have added more than 50 million people; and 12 years hence the most recent projections indicate another 100 million persons in the United States and by the year 2000 a total population of 340 million is predicted for this nation. At least 83% of this population — 281 million people — are expected to live in our cities. Some of these urban areas will be in all likelihood unbroken stretches — the megalopoli — with little evidence at present that the widely discussed green belts and parks within these megalopoli are more than a still-born dream. This same trend can also be seen in the present disposition of our commercial forest lands, transportation (air fields), power easements, wildlife refuges, water management and outdoor mass recreation. Considering our rate of growth and the many complications attending it, unless we concern ourselves seriously about the conservation and the wise and efficient use of our natural resources, we will impoverish the quality of our physical growth and stifle the esthetic benefits of resource use. The time has come when we must quickly gain greater awareness of the relationship of all human activity to the life cycles that exist on our planet.

Until now, on too many occasions, each specialized group has striven for its goals with slight heed concerning the effect their actions might have on other allied groups and sometimes even on the resource. We are at the point where we must stop to re-examine and reorder our surroundings if we are to preserve what is there, or to restore what may remain from the unimaginable heat and horror of nuclear fire, and from the desolation produced by the repetitious tread of thousands of feet. What we must do is to re-establish an ethic which deals as much with the relation of man to his environment as with the relation of man to man. This is to say that both survival and fulfillment for man are a function of his establishment of harmony with his physical and his biological environment.

This re-examination is certainly a large order and it will require the cooperation and thoughtful concern of every adult citizen. It involves investigations of questions of technology, biology, economics, engineering, sociology and politics. Seen in this light it becomes obvious that maintaining our resources clearly calls for wise management and for intelligent conservation-oriented decisions in the handling of the urban environment and of the soils, waters, forests and wildlife. Surely the soil resource can be maintained through proper environment and the competing demands on the land require that we make maximum use of all land. The industrialist, W. H. Hunt, has suggested three broad rules for guidance in wise resource management:

1. "Maintain a flow of new and improved resource technology in the discovery of natural resources and the conversion of these resources into products for the benefit of mankind.
2. Maintain an expanding world trade and exchange system which can enlarge the opportunity of the United States and other nations for exchanging raw materials at low cost.
3. Conserve and use resources in accordance with sound ecological and economical principles."

At stake are the physical and human resources of this nation. Managing these resources for the greatest benefit of all is maybe our greatest problem; greater than minority problems and greater than poor people's marches, for without this kind of management all the people and all the land will be impoverished. The pollution of air and water and the contamination of our environment is bad enough, but almost the worst pollution of all may be the umbrella-like etymological pollution encompassing the entire situation — in the broad stream of resource conservation, the flow of words has nearly swamped the protecting levees of antipollution planning and is constantly threatening to overflow the river banks of accomplishment.

Because environmental protection efforts require a wide range of scientific and engineering manpower it is particularly disheartening to note the absence of a comprehensive roster of highly qualified engineers, scientists and technologists concerned primarily with environmental protection in the United States. Categories of manpower involved in this area include zoologists, botanists, oceanologists, chemists, all varieties of ecologists and engineers, epidemiologists, hydrologists, limnologists, meteorologists, microbiologists, pathologists, pharmacologists, physicists, physiologists, taxonomists, sanitarians and toxicolo-

gists — and, of course, a great variety of technicians and aids. To aid these professionals in accomplishing the conduct of specialties concerned with the preservation and control of environmental hazards, with the stimulation of research and development, and for the important work in training and teaching, such coordinating personnel as administrators, analysts, attorneys, economists, information specialists, statisticians, veterinarians and medical people at all levels and degrees of training are needed.

One of the greatest difficulties at the present time is that the total number of personnel operating in all these categories of environmental protection activities is a woefully inadequate 37,000. Deterrants to the development of a more meaningful roster are that: (1) at the undergraduate level there are only 30 colleges and universities countrywide offering programs in environmental health, and at the graduate level, graduate programs in environmental protection with or without federal assistance are offered at 20 institutions in air pollution, 19 schools in industrial hygiene, 33 colleges and universities in radiation protection, 8 schools in solid wastes, 78 institutions in water supply or water pollution, and 51 colleges and universities distributed among air pollution, public health, toxicology, food planning, systems protection, and so on, (2) a lack of understanding of the roles and functions of the various disciplines, and (3) the interpretation of occupations in terms of basic disciplines versus categorical program specializations. In addition to providing additional training in all these areas, perhaps by means of an efficiently innovated, specially designed and professionally directed crash program throughout the country, the interdisciplinary approach must be emphasized above all other considerations if the management of the growing complexities of the problems inherent in man's rapidly changing environment are to be satisfactorily unravelled. If any impact on these environmental problems is to be made, the number of people involved must be certainly twice and hopefully three times the number now employed in both the public and private sectors.

In spite of the promise that ecological research appears to hold for the solution of environmental problems, and in addition to the lack of sufficient finances and adequate manpower as already noted, the science of ecology suffers with the other environment quality disciplines in the absence of national commitment. Fortunately today, largely because of the activities of the citizen's conservation organizations, of which the

largest, the National Wildlife Federation is a good example, public awareness of ecological problems is beginning to make itself felt. In the words of La-Mont C. Cole, President of the Ecological Society of America, "Ecology has entered the vocabulary of legislators. Even the speech writers of some presidential aspirants have been consulting ecologists." However, in spite of the fact that between 2500 and 2600 graduate students are at the present time training for a doctoral degree there are not enough limnologists, foresters, oceanographers, game managers, fisheries specialists, bioclimatographers, biogeographers, botanists, zoologists and so on enrolled to carry on the many ecological programs, many of them beyond the planning stage, at local, state, national and international levels in the immediate future. Perhaps even more important is the training of instructors to teach these ecologists. This means in turn that we need even more curricula in natural resources conservation for both undergraduates and graduates at additional public and private colleges and universities to provide the nuclei of faculties with the necessary background to develop ecology instructors.

The types of problems that ecologists will have to attack are in such diverse areas as population growth (the single phenomenon that underlies virtually all of man's environment problems), the interaction of organisms in ecosystems (an area that today must be assisted by computer simulation and a multi-disciplinary approach), the causes and consequences of oxygen and carbon dioxide changes in the atmosphere, the modus operandi of marine plankton upwellings, the short and long term effects of pesticides and herbicides, the possible ecological consequences of the proposed construction of a sea level canal in Central America, and the biological causes and effects of biogeochemical cycles.

Fortunately, in addition to the accelerated programs presently provided by academe, there is evidence of increasing substantial extra-collegiate financial support and commitment to the solution of environmental problems. The National Science Foundation has developed a strong environment section and has become increasingly concerned with ecological affairs; professional organizations such as The Ecological Society of America and The American Fisheries Society have taken leadership in developing committees whose specially selected members are concerned with interpreting the results of basic ecological research on applied areas; citizens conservation organizations as the National

Wildlife Federation act in concert with professional biology societies or by themselves in testifying by invitation before congressional committees on pending conservation legislation and in maintaining communication with members of Congress and other federal agencies; the importance of the International Biological Program (The IBP) in this area, as shown by the fact that at least half of the U.S. National Committee for IBP are ecologists; and certainly in this connection must be mentioned plans for a proposed National Institute of Ecology which will in all likelihood unite at great profit the separate efforts and thinking for ecologically oriented natural resource and environmental contamination research.

If our environment is to be maintained at a healthily uncontaminated level and if we are to conserve our natural resources the time is present to act immediately and purposefully on plans already developed and readily available. To procrastinate further is to live dangerously — to practice biological brinkmanship with our hominid future. It would be difficult to improve on the just published recommendations of President Johnson's Council on Recreation and Natural Beauty, "From Sea to Shining Sea, a Report on the American Environment — Our Natural Heritage," in pointing up long range goals for improvement of our environment. The report concludes that the United States needs both the renewal of our cities and the preservation of our wilderness, and that neither one should be pursued at the expense of the other. It is of greatest encouragement to note that President Nixon has emphatically stated that this country must find the time and energy to preserve and improve its natural heritage and prepare to hand it over to future generations in an improved condition. In the recent words of our greatest Secretary of the Interior, Stewart L. Udall, "We must bring the human population of this planet into balance with its resources, and learn to avoid fouling our environment so that we make possible for men everywhere not mere animalistic survival but a life that permits the enjoyment of basic human values, the beauties of nature and art, and the flowering of individual creativity."

Indeed the creation of knowledge and our way of life must be one if man is to endure on this planet as a healthy, ordered, evolutionarily successful organism. To succeed in this and move toward a brighter day, he must learn to accommodate himself with his environment, maintain an optimum balance of nature, and budget wisely his resources.

Conservation Bill of Rights

ANSS members are urged to carefully consider the following proposed Constitutional amendment, prepared by Congressman Ottinger, and supported by ten other Congressmen in a joint resolution.

"Sec. 1. The right of the people to clean air, pure water, freedom from excessive and unnecessary noise, and the natural, scenic, historic and esthetic qualities of their environment shall not be abridged.

"Sec. 2. The Congress shall, within three years after the enactment of this article, and within every subsequent term of ten years or lesser term as the Congress may determine, and in such manner as they shall by law direct, cause to be made an inventory of the natural, scenic, esthetic and historic resources of the United States with their state of preservation, and to provide for their protection as a matter of national purpose.

"Sec. 3. No Federal or State agency, body, or authority shall be authorized to exercise the power of condemnation, or undertake any public work, issue any permit, license, or concession, make any rule, execute any management policy, or other official act which adversely affects the people's heritage of natural resources and natural beauty, on the lands and waters now or hereafter placed in public ownership, without first giving reasonable notice to the public and holding a public hearing thereon.

"Sec. 4. This article shall take effect on the first day of the first month following its ratification."

"Environmental education, conservation education, resource-use education — call it what you will. Development of conservation literate citizens is essential to survival of this and every nation. A new vigor and high priority must be given to developing improved education along these lines."

— Charles E. Roth in Massachusetts
Audubon June 1968

"On some winter mornings even the most careless of mortals must pay admiring tribute to the trees, for again are they clad, this time in a glittering raiment of soft snow. Such a day is the apotheosis of winter, and one must needs go into the still forest and worship. The stillness is commensurate with the whiteness."

—Anna B. Comstock

The Role of IUCN in Maintaining the World's Ecosystems

E. J. H. BERWICK

Secretary-General IUCN, Morges, Switzerland

The Conservation Crisis

The conservation of nature and natural resources means many things to many people. To some it means having enough animals and birds to support large-scale hunting and fishing. To some it means preserving the wilderness. To some (and IUCN is included) it means the rational use of the earth's resources, to achieve the highest quality of living for mankind; to others it means guarding "spaceship earth," where the elements in the biosphere, the productive rind of land, water and air, using only the driving force of the sun's energy, must be cycled in such a way that life may be maintained in perpetuity. However it may be defined, many perceptive scientists are agreed that within the next decade or two there will be a crisis, not only for conservation, but possibly for the survival of a large part of mankind. The basic problem is now well-known: the human population is outstripping the ability of our increasingly tired and ravaged earth to sustain it. The only permanent solution to this problem, which is basically an ecological one, is a limitation of human numbers. If man fails to find a means of doing this, he jeopardizes his very survival and the question of the need for conservation organizations becomes academic.

If a solution for the numbers problem is found, and we must proceed on this somewhat optimistic assumption, the question arises as to what sort of life the survivors may want, and whether they will be able to find it? It is our belief that future generations will want some wild land and a varied fauna and flora to enjoy, and that this generation, as a temporary custodian of the biosphere, has a moral obligation to see that these necessary amenities do not disappear. The world's ecosystems so essential to mankind must be maintained. We no longer can take for granted the future survival of such resources without active and intelligent vigilance. Today's world is far too small, and the pressures for exploitation are far too heavy. The extinction rate of animals and plants has accelerated sharply in recent decades. We predict that there will be new attempts to cultivate the marginal and sub-marginal lands that now constitute so much of the earth's remaining habitat for all but human species. We predict

also that there will be pressure to use new and untried biocides in the hope of producing more food for the short term at whatever long-term cost in productivity or loss of non-human life. New pressures will inevitably be exerted on the oceans, a domain about which we know so little that we may not even recognize the threats to its continued productivity. There will almost certainly be other pressures on the biosphere which cannot be foreseen. A generation ago, who could have foreseen that ocean ecologies would to-day be menaced by pollution from radioactive wastes and persistent pesticides?

There is an ever increasing need therefore for an organization that will look at the biosphere as a unit, understand its functioning and work actively for its preservation. Such a body must be politically independent, and internationally or even supranationally oriented. There are many organizations that deal with certain aspects of the renewable natural resources of the biosphere, including man; UNESCO deals with education, science and culture; FAO with food and agriculture; organizations such as the Conservation Foundation are concerned with most aspects of conservation on a regional basis. But the need is for an organization which takes a wide view of the biosphere as a whole. The International Union for Conservation of Nature and Natural Resources is one such body, and probably the only one with world-wide competence and status.

The Union

The International Office for the Protection of Nature, a forerunner of IUCN, originated in 1928. After the end of the Second World War, the continuing need for an international non-governmental protection organization led to a meeting at Fontainebleau in 1948. Sponsored by UNESCO and the Government of France, this meeting resulted in organization of the International Union for the Protection of Nature. In 1956, its name was changed to the International Union for Conservation of Nature and Natural Resources to reflect the broadening of the outlook of the Union and to keep in step with changing ideas about conservation.

The Union is governed by its Statutes. It is a Union whose membership com-

prises States, Governments which adhere to its statutes, at present numbering 27, and public services and government departments, and organizations, institutions, and associations of private citizens and groups, whether governmental or non-governmental, concerned with conservation of nature and natural resources. There are now 218 of these in 58 of the countries of the world. It is therefore an independent, international body, recognized as non-governmental organization by the Agencies of the United Nations Organizations, with which it has consultative status.

In form, it comprises a General Assembly, an Executive Board and a Secretariat. The General Assembly, which meets every three years, elects a President for the period until the next General Assembly and not more than 18 members of the Executive Board, of whom there shall be no more than two for any one country, who serve for six years. At least two of the members of the Executive Board are elected Vice Presidents. The General Assembly also appoints a Secretary-General for a period of three years, sets up the Union's Permanent Commissions and elects their Chairmen.

The objects of the Union are defined in Article I of its Statutes, which reads:

1. The International Union for Conservation of Nature and Natural Resources shall encourage and facilitate cooperation between governments, national and international organizations and persons concerned with and interested in the protection of nature and conservation of natural resources.
2. The Union shall recommend and promote national and international action in respect of:
 - a. the preservation in all parts of the world of wild life and its natural environments, soils, water, forests, including the protection and preservation of regions, objects and fauna and flora having scientific, historical or aesthetic significance. Among appropriate measures will be legislation including the establishment of national parks, nature reserves and monuments and sanctuaries for wild life. The Union shall give special attention to the preservation of species threatened with extinction;
 - b. the spread of new scientific techni-

- ques in nature protection and the conservation of natural resources with a view to their wise utilization;
- c. the promotion and wide diffusion of an extensive programme of education and information aimed at increasing public awareness of nature protection and the conservation of natural resources;
 - d. the preparation of international draft agreements and of a World Convention for the conservation of nature;
 - e. scientific research relating to the protection of nature and the conservation of natural resources.
3. The Union shall collect, analyze, interpret and disseminate information on conservation of nature. It shall distribute documents, legislative texts, scientific studies and other information on the subject to governments and national and international organizations.

The Union believes that these objectives can best be reached by promoting:

Awareness through education, so that as many people as possible may understand the value and importance of renewable natural resources and appreciate the need to use them wisely.

Research to discover the best measures for conservation and to advance the study of ecology upon which all practical conservation depends.

Assistance in providing advice based on ecological considerations, scientific and technical data, source material and references and all the manifold contacts required for the coordination and conduct of practical conservation programmes, and finally,

Action on a national and international scale, by enlisting the cooperation of governments and international agencies in support of conservation programmes as well as in strengthening legislation and improving its enforcement.

The Union's income is made up of subscriptions of Member States graded according to the population of the country, subscriptions of member organizations and associations and grants and donations. In order to assist in financing world conservation including organizations such as IUCN, the World Wildlife Fund was started in 1961; the World Wildlife Fund, or WWF, as it is known, is an international non profit-making foundation for saving the world's wildlife and wild places, and is normally IUCN's main source of financial support. With the ever-increasing workload, additional grants and donations, for specified or unspecified purposes, are urgently needed.

The Union has divided its work into five sections:

1. Education
2. Legislation
3. The Conservation of Areas and Species
4. The Development of Natural Resources
5. The Operations Intelligence Centre and Secretariat

At this point let us make one fact very clear, lest from some previous remarks it might be thought that IUCN is a kind of United Nations organization with a big bureaucracy and layers of staff. Quite the contrary. We are in fact largely an organization of dedicated professional volunteers. Our Commissions, six in all, which do most of the work, comprise over 400 individual people, most of whom are scientists, educators, administrators, or professional men practicing one of the disciplines of the natural sciences. Our paid secretariat consists of less than a dozen officers, which is a small staff indeed to conduct the affairs of a world-wide operation.

1. Education

In the long-term, environmental education is a prerequisite to maintaining the world's ecosystems; the Union therefore formed a Commission on Education in 1950 to be responsible for all educational aspects of the Union's work. In the context of IUCN's objectives in education, it is essential for the Commission on Education to operate on a regional as well as world level. This policy of the Commission has been greatly furthered by the creation of the North West Europe, the East Europe and North American Committees of the Commission on Education. It is essential to develop additional regional committees, and proposals have been under discussion for establishing them in South East Asia, Africa, South America and elsewhere.

The Commission, therefore, regards as vital that it should promote:

1. The establishment of a strong and effective system of conservation education at all levels in educational institutions of all kinds and as part of out-of-school education.
2. The development of an approach to conservation education, which correlates environmental sciences with social studies.
3. The development of comprehensive information services in relation to the wise use of natural resources, and their conservation and restoration for the benefit of all people.

In carrying out its mission, the Commission on Education has a variety of ongoing activities; for example, it is conducting with UNESCO or other UN substantive Agencies, a series of regional surveys to ascertain requirements of conservation education material, and to pre-

pare plans for its dissemination.

The Commission is preparing a plan for higher education and training to implement the recommendations made at the Lucerne Symposium on Conservation Education at the University level, and to discuss further with educationalists and conservationists in South East Asia the consolidation of the educational achievements of the Bangkok Conference. The Education Commission works with the International Youth Federation for the Study and Conservation of Nature and to assist its worldwide activities. It works in close co-operation with UNESCO in the creation of Regional Committees and in providing advisory services for the developing countries and for older nations too.

For instance, this Commission sponsors a project of research in teaching conservation at elementary and secondary schools by the Science Department of the Pedagogical Faculty, J. E. Purkyne University, in Brno, Czechoslovakia, and recently assisted the Government of India in establishing curricula on the conservation of nature and natural resources at Indian universities.

2. Legislation

No less fundamental than education is the necessity to protect the world's ecosystems through legislation and plans enforcement, and for this purpose the Union's Commission on Legislation was formed in 1960. Its task is twofold. Its first role is to provide information to governments, parliaments or their members, national and international organizations, on legislation in force on the subject of conservation. Its second role is to make available advice on proposed legislation, international agreements or conventions in the field of conservation.

In preparing to accomplish these tasks the Commission is now collecting the texts of legislation and regulations in force concerning conservation of nature and natural resources, as well as related legislative measures or regulations. This documentary and scientific base, properly organized and kept up-to-date, is essential to provide services and advice in minimum time. Obviously, several years of work and adequate funds will be needed to establish this base.

Part of the long term programme of the Commission includes studies by limited subject and by legal system. Certain studies already completed, such as that on the hunting systems in Europe, and that on the legal instruments used in Western Europe to protect certain areas, may be taken as models of what should be achieved.

3. The Conservation of Areas and Species

The Commission on National Parks

specializes in the long-term task of encouraging the establishment of national parks throughout the world; it exchanges information on the management of existing parks and makes arrangements for international conferences dealing with national park problems. With the support of ECOSOC and in cooperation with the United Nations, the Commission also maintains a list of the world's national parks and equivalent reserves. This list has been published in French, and an edition in English is being prepared. A subject of continuing work is the preparation of a universally acceptable definition of National Parks.

The short-term "fire-brigade action" is taken by the Survival Service Commission, whose functions are to collect data on endangered species and to initiate action to prevent the disappearance of these species.

A rational approach has been developed for the *collection of data*; the immediate end product, the Red Data Book, is internationally accepted as the authoritative source for information on endangered species. Two complete volumes are available (Mammalia and Aves), two are partially completed (Amphibia & Reptilia, and Pisces), one more has been started (seed-bearing plants).

With regard to a comprehensive approach to the *initiation of action to prevent the disappearance of endangered species* it must be accepted that the Survival Service Commission has insufficient resources to take unilateral action for the study and conservation of all endangered species. The principal objectives should be to determine what action is required and to transfer much of the responsibility for effecting these proposals to the countries concerned, or to other agencies or organizations. Recommendations would be based on the information in the Red Data Book, but there should be considerably less accent on individual species and more on the management of the ecosystems in each country.

The more obvious lines of approach are as follows:

1. Every country must be informed of its endangered species and sent copies of the relevant Red Data Book sheets, possibly with the request that IUCN be informed, in due course, of what remedial action has been taken. Further advice could be provided and action plans for individual countries might be prepared on request.
2. International organizations, principally the FAO, must be involved more closely in work on endangered species in the future. Many countries' projects will presumably find their way back to them. Where possible, restoration projects for endangered

species should be added to conservation programmes which are already established. Close liaison must be maintained with IBP, the International Biological Program.

3. Selected projects, involving further collection of data on endangered species and recommendations for action, should be transmitted to universities, research institutes and the larger conservation organizations.

The Survival Service Commission retains a special interest and responsibility for the conservation and study of species for which international cooperation is essential. These species comprise the marine animals (e.g. polar bear, sea turtles, seals and whales) and very rare terrestrial animals which occur in a number of different countries (e.g. Sumatran rhinoceros).

4. The Development of Natural Resources

Since conservation and the rational development of natural resources are firmly rooted in the science of ecology, the study of the relationships between living organisms and their environment and the interactions of the organisms themselves, the Commission on Ecology plays an important role.

Its terms of reference, originally defined as "the application of ecology to the practical programmes of land management and nature protection" have been expanded to include maintaining the strongest possible link at a scientific level between IUCN and the International Agencies concerned with natural resources.

Its members represent a broad range of geographical distribution and specialized interests; they are called on to advise on matters within the Commission's terms of reference. The Commission maintains a small office in London at the Headquarters of the British Nature Conservancy, staffed by a Secretary, with part-time clerical assistance.

Examples of the initiatives in which the Commission has been closely concerned are the "Special Projects" of the last six years on conservation in Africa, South-East Asia and Latin America, all of which have had the fullest backing from FAO and UNESCO.

Another example is the still operative "Mar Project" on the conservation and management of "Wetlands," a subject which extends into the field of interest of many intergovernmental agencies, but which IUCN by its contacts both with the latter and with other international bodies (in this case the International Council for Bird Preservation and the International Wildfowl Research Bureau) as well as national organizations, governmental and otherwise, all of them deeply

concerned with water resource problems, has been in a favourable position to develop. The most recent expansion was the organization by the Commission of a technical meeting held in Turkey in 1968, on the extension of the "Mar Project" to South-West Asia.

Within financial limitations the aims of the Commission are to maintain "consultation by correspondence," through its periodic newsletters, and to sponsor meetings of its members and technical meetings or projects, to fill gaps that the intergovernmental agencies, particularly FAO and UNESCO, are unable to cover but would always willingly support.

One such project, at present being undertaken by the Commission's London Office, is the preparation of the English version, with some up-dating and revision of the ecological section, of the Second Edition of the United Nations List of National Parks and Equivalent Reserves (the French version of which, prepared by IUCN's National Parks Commission, was published in 1967).

It has been agreed in principle that the work initiated by the Conservation of Terrestrial Communities Section of the International Biological Programme on the identification and assessment of undisturbed island ecosystems in the Pacific Ocean, should be carried forward by the Commission in other important oceanic areas, particularly the South Atlantic and Western Indian Ocean.

Finally, mention should be made of the important function of the Commission in helping to ensure the adequate representations of IUCN by suitable scientists, bringing in the independent non-government view, at the major meetings organized by U. N. Agencies.

One of its Committees, the Committee on Landscape Planning, has recently been raised to Commission status.

The function of this Commission on Landscape Planning is to further the concept of the landscape as a basic resource, an inter-dependent functional whole, as a habitat for man and other life forms, to encourage comprehensive land-use planning as an integral function in development schemes, and to bring into this activity the cooperation of social science disciplines, as well as the cooperation of international governmental organizations and professional landscape planning agencies.

The Programme of the Commission is designed to further environmental quality, in particular to foster the concept of landscape planning as a creative approach to many problems of conservation; this approach is also regarded as a way to the optimum use of the landscape

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THE BADGER

Taxidea taxus

The badger, **Taxidea taxus**, is a member of the Mustelidae which includes the martins, weasels, mink and otters. As powerful digger it readily searches out burrowing rodents such as ground squirrels, though does not hesitate to feed opportunely on birds and insects.

The badger, without question, is a valuable mammal in the ecological picture through its food habits. A large badger will weigh up to 24 pounds though generally will average near 15 pounds. Its range extends throughout the United States from Ohio to Washington and southward. The powerful claws and well-equipped teeth make it a powerful adversary for any dog which might attack it.

The 1-5 young are reared in a grass-lined nest at the end of a burrow which extends up to ten feet underground.

Like the skunk to which it is related, the badger when taken quite young makes a good pet.

Photo by

Donald Burt

Bureau of Land Management

Provided by the Audio-Visual Committee

American Nature Study Society

No. 29

(May be removed for display)



BLM Photo by Donald Burt



SCS Photo by Lester Fox

CATTAIL

Typha sp.

The cattails are monocots of the family Typhaceae which are widely distributed at the margins of swamps and ponds mainly in the northern parts of the United States. This plant is a favorite food of muskrats. The habit of harvesting this plant for food as well as for the muskrat houses provides numerous open spaces of value to waterfowl. Were it not for this activity, the cattails would soon fill in much of the shallow areas making them impassable for ducks and other waterfowl.

The early spring shoots of this plant are a delicacy for those who are interested in cooking up wild foods. Before the cattails appear, the plant shows no central stem, each leaf arising from the base. Demonstration of this feature to field study groups is always of interest.

Photo by

Lester Fox

Soil Conservation Service

Provided by the Audio-Visual Committee

American Nature Study Society

No. 30

(May be removed for display)

NATURE STUDY TIPS

Models as Visual Aids

HELEN ROSS RUSSELL

Models may be very useful visual aids when they deal with subjects that are not easily observed by the naked eye either because of small size, great size or inaccessibility; but unless they are carefully selected and wisely used they may represent an expensive investment that pays poor dividends.

Models of botanical specimens generally are less satisfactory and result in poorer teaching than actual specimens. A model of a flower is a fine example of this. Flowers are easily available almost everywhere. They may be picked in fields, along roadsides and in gardens. In cities they may frequently be obtained from a friendly florist who is willing to part with some not-so-fresh-specimens for a good cause. Students can frequently provide them. In extreme cases they may be purchased reasonably. A few branches of forsythia and a bunch of violets or sweet peas can provide every student with specimens to examine.

Discovering the rows of "eggs" in a violet ovary is much more exciting than looking at the painted structures in a plastic model of a "typical flower." If flower structures are being studied, exposure to several kinds is important so that an appreciation of the great variety of flower forms and adaptations may be developed — and the idea of a "typical flower" rejected.

Cross sections of leaves or stems are other types of material that may be better taught with the actual specimen. Grade school children can develop an appreciation of the three dimensional quality of leaves by observing the work of leaf miners. Not only can they see that upper, lower and middle layers exist but they can also discover which layer or layers contain chlorophyll by careful observation. Leaf miners exist everywhere where green plants grow.

Cell structure and arrangement can be studied when students have access to microscopes. Interested students might make a model of a leaf by combining drawings of top, bottom and cross-sectional views and gluing them on a proportionately shaped cardboard box.

In fact, making of models can be an excellent teaching aid. A commercially

prepared model tends to be an extension of the textbook. It shows. It tells. It rarely requires involvement. It does nothing to increase skills of visual perception. Making a model requires close scrutiny, comparisons, and awareness of form and relationships.

One of the best materials for model making is plasticene. It is cheap, easy to obtain, easy to use, and equally easy to destroy and reuse. These last two qualities are important. If every student has a ball of plasticene in his desk or available in the supply cupboard the creation of three dimensional forms can contribute to many lessons.

For instance, if a class is studying protozoa and everyone is asked to make an ameba, an interesting variety of forms will appear. Some students will make flat, sharp-edged two dimensional forms because they cannot interpret either the textbook illustrations or the specimens they see under the microscope as three dimensional. Students with imagination will make food vacuoles and the nucleus in various ways. The variety of forms created is a good example of the variety of shapes that a "shapeless blob of protoplasm" can take. If each person has approximately the same amount of clay the variety of exposed area in various positions becomes obvious. Other protozoa can be made in the same way. This technique not only helps the student visualize, it helps the teacher to know where students are confused or unseeing.

Plasticene has the added advantage of being easily manipulated. A three dimensional cell can be pinched in — and divided into 2 daughter cells.

Processes can be illustrated as well as forms. For instance in geology synclines, anticlines and folds can be formed easily by pushing layers of plasticene into appropriate positions. Erosion with a wooden tool from tops of anticlines and deposition of the eroded material in synclines illustrates the inversion of layers and some of the problems involved in reading strata. So does a paring knife "road cut" through a fold and particularly through an eroded fold.

Faults can be easily illustrated with layers of plasticene, a knife and some pressure. Because students are providing the "geological forces" they gain

understandings that cannot be matched by pictures or static models.

Model building of this kind may give students tools for interpreting when they go out to observe a road cut or a quarry. Or the activity may be a follow up record of what was observed on a field trip. Models of this type may also help provide understanding in areas where certain geological processes cannot be observed outdoors.

Tree growth is another process that can be given meaning by the use of different colored plasticenes. A tree is essentially a series of elongated nested cones under a covering of bark. At the end of the first year the tree is just one long, slender cone with a small number of branches (more long, slender cones) attached. That original cone will not change size, shape or location. The next year a layer of wood will be laid down over it and will extend above it (a hollow cone). The branches will similarly be increased in diameter and length and new branches will probably arise. This is repeated each year as long as the tree lives. If the original cone is made of one color of plasticene and succeeding years' growth of other colors, growth, annual rings, knots and wood patterns can all be dramatized by cutting across the base of the model, then slicing it lengthwise into "boards." A comparison of the pattern thus formed with the pattern in wooden tables and desk tops will enable students to read many growth stories in the furniture.

Plasticene is not the only cheap, easily manipulated material. Disposable pie pans, earth, plant materials and a laundry sprinkler can be used to work out many stories of water, land and plant inter-relationships that can be made meaningful not only to rural students in relationship to farming but to urban ones in relationship to water supplies, river channels and reservoirs.

On a larger scale geological stories of earth forms and water patterns can be developed using natural clays to form mountains, hills, valleys. If a sink is available water may be permitted to flow off the mountain top thus formed for several hours until gorges, river patterns, erosion and deposition begin to be obvious. Or the model may be put outdoors in the rain providing the clay

is fairly firm and the rain not so pelting that all land forms are washed out.

Colored paper handkerchiefs can be extremely useful in demonstrating folding, faultlines, anticlines, synclines, buckling, upthrusting, downbending. If students have several different colors to represent rock layers they can experiment with the various diastrophic forces and witness in miniature the rearrangement of layers. Because the material is easily torn, layers can be removed to add the dimension of erosion to the story.

Obviously, all of these models are short lived. Except for the protozoa a large part of their value came from the fact that they demonstrated change. Even the protozoa could have been used this way since the ameba could be formed and reformed to demonstrate motion, engulfing food, preparation for cell division, etc.

Many different materials can be used for more permanent models. I once assigned a biology class the making of a protozoa model, as an out-of-class activity. The variety was limited only by the size of the class. Wood, styrofoam, plaster, wax, plastics that could be melted on the stove, soap and various other malleable materials were used for cytoplasm. The variety of materials that were used in creating organelles, cilia, flagella, tests and other structures seemed almost limitless. One girl created an unbleached muslin model of a ciliate. Cilia were made by fraying the edge of the material. Macro-nucleus, micro-nucleus and other structures were embroidered on the surface. In proportion, shape and form it was every bit as accurate as an expensive commercial model, and the originator derived a great deal of satisfaction from the operation.

There is a great temptation to keep specimens like this as a permanent exhibit. Certainly they should go on display for a while so they can be compared and enjoyed and even used as a teaching tool. But the main learning comes from the making, for in order to make an accurate model the student must carefully study and observe the creature he is reproducing. If the exhibit is held over for other classes the next set of students loses the opportunity to use its imagination and tends to reproduce a model instead of creating a model of a living creature. Besides, why bother to make a model when there is one on hand?

I once taught a junior high class that wanted to make a permanent contribution to the science room, however, and decided to make a model of the solar system. They spent many unscheduled and after-school hours making the planets to a scale of 1 inch for 8,000 miles.

The results were impressive, for a three dimensional model dramatizes the difference in size between planets like Mercury and Jupiter.

A three dimensional sun on this scale would be nine feet in diameter and was impractical; so they obtained a piece of wall board and cut a semi-circle with a nine foot base. Painted with sunspots, it made a background for the planets which were mounted on top of display shelves. Originally they planned to arrange the planets at the proper distance from the sun using the same scale of 1 inch to 8,000 miles. They discovered, however, Mercury would be out in the alley on this scale and all the rest of the planets would be off school property; so they mounted a card on the sun giving approximate locations using landmarks. (E.g., "Mercury's orbit on this scale would swing over the public library, the church on the corner, the grade school across the street and the alley at the end of the school property. Saturn would swing over the girls' dormitory at the college to the west, the Bologna factory to the north, the drug firm in the town to the east and the riding club to the south. . .")

They had some unexpected side learnings when Jupiter, Saturn and Uranus developed volcanoes. They had used wall-paper paste and sawdust for the construction material. The large planets were built up in layers with additions made only after the surface was dry, but the interior had gradually built up a reservoir of moisture. When they drilled holes for mounting the models on dowels, the interior was both damp and hot. For a while it looked as though the major planets might erupt in flames; but after several days in the outdoors the gas vents stopped forming and the interior cooled off. An armature of chicken wire would have eliminated this problem.

The class left behind a permanent display that dramatized the size and distances involved in the solar system. They had the satisfaction of contributing time and effort to a project they could look on with pride. They found a lot of enjoyment in working together and learned a lot about group effort from the process. They contributed a handsome visual aid to the school.

While this model prevented future classes from participating in that particular activity, it served as a challenge to later students to execute other relationships, either on a short term plasticine basis or in a more permanent form.

Model building and use need not be confined to natural objects or to science classes. Several years ago when Philadelphia decided to involve school children in urban renewal they used art as

the media for seeing and bringing about change. The children took field trips and looked at their city. They drew pictures and made models. Model making involves visual perception. Once they saw what they had they were ready to make recommendations for something better. They then made models to express their recommendations. These second models provided for trees and open space. Obviously science could have been introduced at this point by raising a question about the kinds of plants and trees suitable for urban planting. In fact, this one question opens a whole area of study on urban environments.

And any activity that helps ask and/or answer questions adds meaning to education. Any activity that helps people develop skills of visual perception is tremendously important in today's world of non-seeing. Any activity that can operate independent of reading skills and still challenge the most gifted student is worth adding to the classroom.

When this activity can be carried out with easily available, low cost materials it represents a bonus that should be exploited with imagination. For this 3D learning technique can open eyes and create understandings far better than much of the expensive equipment schools are urged to purchase.

DISCOVER THE FAMILY

"Discover the family.
It's a great day for a picnic.
The sun. A soft breeze tumbling the clouds.
Everything fresh and green.
See it in the faces of your family.
Scooting across wild flower fields.
Crisscrossing shadows under tall trees.
You, the wife, the kids
And the family Yamahas."

Every ANSS member is urged to send his own brand of congratulations to the BETTER CAMPING Magazine (Apr.-May '69), Catherine E. McMullen, Editor, 1027 N. 7th St., Milwaukee, Wis. 53233, for publishing the above as a part of an advertisement for a "Tote-goat." Congratulate the industry on this fine machine which will certainly guarantee the final successful conquest of nature, and particularly the wildflowers, and the quiet serenity of the shadowy places among tall trees.

Your editor would like to see copies of your letters; so keep carbon copies. Every true ANSS member should have such letters showing involvement in basic environmental issues in his files.

Don't leave it to George to write such letters. Don't be one who says, "Someone ought to do something about it." Get involved. Livewire defenders of the environment are needed.

Thoreau, Emerson, Whitman in the Western Wilderness

RICHARD FLECK
University of Wyoming

The American West was an inevitable poetic reality which Thoreau, Emerson and Whitman all experienced toward the end of their lives. Because each one of them lived in an age of westward expansion and the western frontier, they were all very cognizant of the vast territory beyond the Mississippi and of its tremendous literary potential. One needs only to read Thoreau's essay "Walking," Emerson's *Journals and Letters* and Whitman's poetic work "Leaves of Grass" to see that each writer wrote about the West in poetic and enthusiastic terms. The West for them was a natural and wild setting for human endeavor symbolizing the very spirit of the American Nation. The beauty and vigor of the western wilderness as well as the heroic events that took place were considered to be a source of rich literary material.

In 1856, well before Thoreau had ever traveled to the western prairies of Minnesota, he lectured in Concord on the spiritual and literary significance of the American West (later to be his essay "Walking"). He said, "I must walk toward Oregon, and not Europe. And that way the nation is moving, and I may say that mankind progresses from east to west."¹ The heroic aspects of the western saga of the 1850's so captured Thoreau's imagination that he not only lectured on it but also, in 1861, traveled to see it. In "Walking" he stated, "soon after looking at a panorama of the Rhine I went to see a panorama of the Mississippi, and as I worked my way up the river in the light of today, and saw the steamboats wooding up, counted the rising cities, gazed on the fresh ruins of Nauvoo, beheld the Indians moving west across the stream and, as before I had looked up the Moselle now looked up the Ohio and Missouri and heard the legends of Dubuque and of Wenona's Cliff—still thinking more of the future than of the past or present—I saw that this was a Rhine stream of a different kind; that the foundations of castles were yet to be laid, and the famous bridges were yet to be thrown over the river; and I felt that *this was the heroic age itself*, though we know it not, for the hero is commonly the simplest and obscurest of men."² It must be remembered that Thoreau said this before he had experienced the West. He spoke as though he actually *had* seen and experienced the

prairies, rivers and Indians, and perhaps because of this innate interest he decided to go to Minnesota instead of the West Indies for his health. He wished to see a land so different from damp and wooded Massachusetts, and he wanted to see the very process of the settling of a nation "where its fine column of smoke from a settler's cabin rises above the forest, like an ensign, some human life has planted itself, and such is the beginning of Rome, the establishment of the arts, and the foundation of empires, whether on the prairies of America, or the steppes of Asia."³

In the spring of 1861, Thoreau along with a seventeen year old botanist Horace Mann, Jr., left Massachusetts via Niagara Falls for the prairies of Illinois and Minnesota to try and cure middle aged Thoreau who was stricken with tuberculosis. While Minnesota did not cure his disease, it did give Thoreau a true picture of what he had been writing and lecturing about in Concord.

In his manuscript "Notes on the Journey West," Thoreau's writing contains a definite telegraphic, Indian-like style which was, perhaps, the only way he felt that a white man should attempt to describe the rolling prairies and Sioux Indian dances. In picturing a landscape he wrote, "distances on prairie deceptive. A stack of wheat straw looks like a hill in the horizon $\frac{1}{4}$ or $\frac{1}{2}$ mile off. It stands out so bold and high."⁴ And again with a very primitive style he wrote, "That part called Vermillion Prairie lake, fine low prairie covered with mounds in Wisconsin opposite bluff. But some of it sandy. See a peak at Hastings from Red Wing which has a graveyard cross on it. The War Eagle draws $2\frac{1}{2}$ feet (?). The cottonwood and black willow shedding down together up the Minnesota. Could have killed a hundred rattlesnakes a day 6 or 7 years ago about Barn Bluff. Very thick on the hillsides then. 3 kinds in all. Yet nobody been killed that he knew though bitten. Yet made sick some time, a squaw last summer."⁵

Just as though a Sioux Chief were writing, Thoreau described a Minnesota Indian dance: "Indians, 30 dance, 12 musicians on drums and others strike arrows against bows. The dancers blow some flutes. Keep good time. Move feet and shoulders, one or both. No shirts. 5 bands there. Ox cut in 5 parts."⁶ What a contrast to the more sophisti-

cated style of "Walking"! The very primitiveness of the West of the 1860's was so dominating that Thoreau could only describe it in commensurate terms. Nowhere before his western trip do we find passages in his *Journals* written in such a primitive manner as his description of the Indian dance. This telegraphic style must have been greatly attributable to his western experience in that passages from his earlier *Journal* which describe New England are far more tame and conventional. By way of contrast his description of the Massachusetts woods follows: "I find that Merriam's white pine grove is on the site of an oak wood, the old oak stumps being still very common. The pines appear to be some forty years old. The soil of pine leaves is an inch to an inch and a half thick. The oldest little oaks here are five years old and six inches high."⁷ It was extremely unfortunate that Thoreau should have died at age forty-five, for, perhaps, there would have been trips farther west to the Rockies and the Pacific and more essays as powerful if not more powerful than "Walking."

While Emerson had been in the Midwest before his far western journey, it was not until he traveled to California at the request of naturalist John Muir that Emerson experienced what Wilson Clough in his book *The Necessary Earth* terms as "the shock of geography;" that is, the incapacity to find words to describe the wondrous physical features of the land.

On February 13, 1867, while on a lecture tour in the Midwest, Emerson wrote: "In riding in an open sleigh, from Oshkosh to Ripon, in a fiercely cold snowstorm driving in my face, I blessed the speed and power of the horses. Their endurance makes them inestimable in this rough country."⁸ If the Midwest was considered to be rough country, one can see why Emerson was so awe-struck by Yosemite Valley in the California Sierras.

In the spring of 1871, at age 68, Emerson finally arrived in Yosemite Valley to meet a highly enthusiastic Muir. Apparently the vastness of the mountains, valleys and waterfalls was beyond aging Emerson's comprehension. As Muir said, he was ". . . sauntering about as if under a spell."⁹ In fact, Emerson remained in Yosemite for only a few days, much to Muir's disappoint-

ment. These few days in the Sierras were enough to inspire Emerson to write in much the same way Thoreau had written about the Minnesota prairies; that is, with telegraphic enthusiasm. "Antelopes, prairie-dogs, elk-horns, wolves, eagles, vultures, prairie-hen, owls."¹⁰ Certainly this outburst is the antithesis of his earlier Journal. In depicting the California mountains he wrote: "The attraction and superiority of California are in its days. It has better days, and more of them, than any other country. Mount Shasta, 14,400 feet high, in north-eastern corner of the State. Mount Whitney, 15,000 feet, in Tulare County. In Yosemite, grandeur of these mountains perhaps unmatched in the globe; for here they strip themselves like athletes for exhibition, and stand perpendicular granite walls, showing their entire height, and wearing a liberty cap of snow on their head."¹¹ I think that if we compare Emerson's essay "Nature" with the above, we can only conclude that the primitiveness of the western land was overwhelming in its affect on Emerson.

When John Muir wrote one year later "I can't understand the laws that control you to Concord. You are called of the Sierras—an atom elect. Strange you come not to your magnets,"¹² he must not have understood that the shock of western geography had Emerson in its spell. A brief examination of Emerson's pre-western Journal will show that the descriptions of nature in New England are hardly telegraphic: "No art can exceed the mellow beauty of one square foot of ground in the woods this afternoon. The noise of the locust, the bee, and the pine; the light, the insect forms, butterflies, cankerworms hanging, balloon-spiders swinging, devils-needles cruising, chirping grasshoppers; the tints and forms of the leaves and trees—not a flower but its form seems a type, not a capsule but is an elegant seedbox—then the myriad asters, polygalas, and golden-rods, and through the bush the far pines, and overhead the eternal sky."¹³ The effect of the West was essentially similar with Thoreau and Emerson. Both unfortunately visited this new and open country in the latter part of their lives. Nonetheless, one can not negate the influence on the thinking and writing of these two New England Transcendentalists.

Walt Whitman looked upon the West as an indispensable link in the Hegelian spiral of advancing and perfecting human civilization, for here was the testing ground of mankind. Here was the rugged, primeval world facing settlers just as it had done two centuries before in New England. The landscapes and

legends of the West played an important role in Whitman's poetry; so important that an actual trip across the Mississippi and into the Rockies was essential for this Atlantic coast poet.

Perhaps the poem pertaining most to the western movement is "Pioneers! O Pioneers!" published in 1865. In the first three stanzas, manifest destiny is quite apparent:

Come my tan-faced children,
Follow well in order, get your weapons ready,
Have you your pistols? have you your
sharp-edged axes?
Pioneers! O pioneers!
For we cannot tarry here,
We must march my darlings, we must bear
the brunt of danger,
We the youthful sinewy races, all the rest
on us depend,
Pioneers! O pioneers!
O you youths, Western youths,
So impatient, full of action, full of manly
pride and friendship,
Plain I see you Western youths, see you
tramping with the foremost,
Pioneers! O pioneers!

These western pioneers upon which American civilization depended, were for Whitman subjects of poetic exaltation not only because they represented the western movement of civilization but also because they were spiritual symbols of man's striving for perfection, however many errors he may make on the way.

It was only natural that Whitman should want actually to visit this land of living symbols. This western environment was to inspire poetry in much the same way Baudelaire was inspired by French countryside in writing his famous poem "Correspondances." Instead of the French woods, it was the prairie grass. "The prairie-grass dividing, its special odor breathing, I demand of it the spiritual corresponding . . ."¹⁴

In September, 1879, thirteen years before his death, Walt Whitman began a four month trip to the Rocky Mountain West. This four month adventure was to be recorded in prose in *Specimen Days* and poetically in a number of poems such as "A Prairie Sunset" (1888), "The Prairie States" (1880) and "Italian Music in Dakota" (1881). After leaving West Philadelphia and traveling through the Midwest he arrived at Topeka, Kansas where he was to deliver a speech, but because he got involved in talking with some university boys, he never did deliver it. Between Topeka and Denver Whitman described the country as ". . . unmistakably prolific, western, American, and on the largest scale."¹⁵

Once Whitman had reached the Rockies, the shock of geography overcame him as it had Thoreau and Emerson. As he traveled up the Platte Can-

yon west of Denver, he wrote ". . . all the wonders, beauty, savage power of the scene—the wild stream of water, from sources of snows, brawling continually in sight one side—the dazzling sun, and the morning lights on the rocks—such turns and grades in the track, squirming around corners, on up and down hills—far glimpses of a hundred peaks, titanic necklaces, stretching north and south—the huge rightly-named Dome rock—and as we dash along, others similar, simple, monolithic, elephantine."¹⁶ It is very curious to note the similarity of this descriptoin to Emerson's sketch of the Sierras.

Whitman goes on to say that "new senses, new joys seem develop'd. Talk as you like, a typical Rocky Mountain Canyon, or a limitless sea-like stretch of the great Kansas or Colorado plains, under favoring circumstances, tallies, perhaps expresses, certainly awakes, those grandest and subtlest element-emotions in the human soul, that all the marble temples and sculptures from Phidias to Thorwaldsen—all paintings, poems, reminiscences, or even music, probably never can."¹⁷ He returned to the East by January, 1880, and it was here that Whitman most assuredly fulfilled his own desire of having ". . . all those inimitable areas fused in the alembic of a perfect poem or other esthetic work, entirely western . . ."¹⁸ His western poetry expresses the fact that "new senses" were developed. In his poem "A Prairie Sunset" I think this is quite evident:

Shot gold, maroon and violet, dazzling silver,
emerald, fawn,
The earth's whole amplitude and Nature's
multiform power consign'd for once to
colors;
The light, the general air possess'd by
them—colors till now unknown,
No limit, confine-not the Western sky
alone—the high meridian—North,
South, all,
Pure luminous color fighting the silent
shadows to the last.

For anyone who has actually experienced a prairie sunset, this poem of colors can be considered highly, esthetically representative.

Almost two years after his return from the West, Whitman was still under its spell. In August, 1881 he wrote of Custer's last rally by saying it was "altogether a western, autochthonic phase of America, the frontiers, culminating, typical, deadly heroic to the uttermost—nothing in the books like it, nothing in Homer, nothing in Shakespeare; more grim and sublime than either, all native, all our own, and all a fact."¹⁹

Thoreau, Emerson and Whitman, three giants of American Literature, all, at one time or another, were deeply in-

spired by what they had seen of the West. Of the three, Whitman was fortunate to digest thoroughly the western wilderness and put it in verse. Thoreau and Emerson at least left us their brief but enthusiastic impressions.

1. Henry David Thoreau, *Excursions* (Boston: Houghton, Mifflin Co., 1888), p. 177.
2. *Ibid.*, p. 184.
3. *Ibid.*, p. 123.
4. Henry David Thoreau, *Thoreau's Minnesota Journey: Two Documents*, Walter Harding, Editor, (Geneseo, N. Y., Thoreau Society Booklet No. 16, 1962), p. 3.
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THE ROLE OF I.U.C.N.

Continued from page 6

as a permanent resource capable of fulfilling the physical, biological, sociological, aesthetic and psychological needs of man, and which does justice to the complexities of nature.

In order to develop into a chief source of information in the field of landscape planning it is proposed to organize, with IFLA, a Bibliographic and Documentation Centre. To this end the first step should be a "feasibility study" which would consider the functions of the Centre and the nature of the Services it should provide. It would also investigate the operational requirements for providing services. Finally it would estimate the accommodation, staff and equipment required, and the capital and recurrent costs. In order to develop plans for obtaining an international inventory of the natural resources of the landscape foremost experts in the field will be invited to participate.

The present Commission Secretariat at the University of Newcastle upon Tyne enjoys facilities of office space and

part-time secretarial assistance, provided through the generosity of the University. However, in order to expand the services of the Secretariat to handle the increased volume of work, a full time Secretariat at Morges should be established.

5. The Operations Intelligence Centre and Secretariat

Whereas the Commissions work through the Chairmen and Secretaries who are stationed in various parts of the world, the Operations Intelligence Centre and Secretariat are concentrated at the Union Headquarters in Morges, Switzerland. The executive secretaries of the Commissions, each within his discipline, supply data to this Centre, where they are coordinated and used as a structure on which draft policies for nations, biotopes or endangered species may be based for submission to the Executive Board. The Centre may conduct investigations into the status for endangered species, survey the system of nation parks in a country or organize a training for park rangers, possibly on a regional basis.

With the assistance of the Secretariat, it organizes conferences and meetings and publishes the proceedings as both technical and popular works.

IUCN has been established to deal with conservation in its widest sense. The agencies of the United Nations, especially UNESCO and FAO, and other organizations are involved in research to obtain the necessary data, and in planning and implementing projects. These and many specialized bodies deal with important sections of the requirements. There remains, however, the need for an overall exploration of the world conservation spectrum, for a continuing assessment of trends and for early detection of new developments and needs.

IUCN, an independent international body, with consultative status with U.N. agencies, has a real part to play in international conservation as almost all its activities serve to maintain either directly or indirectly the world's ecosystems.

Another Book by Gertrude Allen

The fifth in Miss Allen's *Everyday Nature Series* was published in March 1968, on the twenty-fifth anniversary of the publication of the first book in the series. These books are for grades Kindergarten through third, and are written and illustrated by Miss Allen from her personal experiences. Other books in the series are: *Everyday Birds*, *Everyday Animals*, *Everyday Insects*, *Everyday Wildflowers*, and *Everyday Trees*. The series is published by Houghton-Mifflin Company.

The Fate of Brooks in Cities and Suburbs

The following are typical steps whereby cities lose their streams.

1. Growth of apathy and ignorance of the value of brooks. This is partly because there are more people and fewer brooks from which they can learn.

2. Lack of care for the brooks. Increasingly, adults dump junk into them and children get blamed when they emulate their elders. Litter clogs the flow and sometimes causes flooding. Litter attracts rats and breeds more mosquitoes — and the poor brook gets blamed. Fish populations decrease.

3. Reduction of the brook's valley by fill, partly because some people profit by supplying fill, by moving fill, or by using filled land for some economic enterprise. As a result, the brook rises higher in time of flood and runs lower during droughts, creating more animosity which is not its fault.

4. Complaining that the brook may be a hazard to small children because of the steepness of the filled banks. The brook is now referred to as the "ditch." Working mothers and contractors cry for its death at once.

5. Burial of the brook in a pipe. The children, deprived of a many-splendored thing, run and play in the "safety" of the streets.

6. Ignorance of brooks increases now that the brook is gone. A new generation grows up without ever having played in a brook. People become more ignorant and fearful of brooks and therefore add their weight to the destruction of the next brook toward which the city is relentlessly extending.

The Challenge

These modern cities extend mile after mile becoming increasingly desert-like, increasingly barren, populated by people increasingly ignorant and fearful of water and the rest of the natural resources which make cities possible.

This process of ruination of the human habitat will proceed step-by-step, with fateful irrevocability, until intelligent men and women see for themselves that the above is true. Then with determination, they will fight apathy, ignorance, fear and greed. They will recognize and identify short-sighted vested interests bent on destroying community's brooks. They will help their fellow citizens become more aware of the utility and beauty of brooks on urban and suburban settings.

REMEMBER:

**CLEAN, GREEN STREAMBANKS
CAN HELP FIGHT BLIGHT!**

References:

Hyla Brook and A Brook in the City, by Robert Frost. — John W. Brainerd

Welcome To New Members

Mrs. Evelyn Bell, Clarksville, Tennessee
Mrs. Kenneth R. Briggs, Poughkeepsie, New York
Perrie L. Cobb, Ukiah, California
Miss Lee Anna Deadrick, New York, New York
Rene de Oliveira Dutra, Rio de Janeiro, Brazil
Mrs. Janet Greenfield, Cortland, N. Y.
Brother Ignatius, Butler, Pa.
Mrs. Howard S. Kittel, Ft. Worth, Texas
G. Andrew Larsen, Valley Cottage, N. Y.
Clarence J. Messner, Ann Arbor, Mich.
Kent L. Scott, Olmsted Falls, Pa.
Peter Tomlinson, Utica, Michigan
John M. Trout, Ridgefield, Connecticut
University of West Florida, Pensacola, Florida
A. Van der Bellen, Plainfield, Vermont
Stewart Welsh, Cincinnati, Ohio
Roger Wharton, Mansfield, Ohio
Mrs. Chase Wilkins, Cortland, New York

The Best of Biology

The best of biology and the best for biology can be had from outdoors. Good learning situations involve many things. Motivation must be involved, and it is hoped that such is built in through your own desires to learn and to broaden your background. There must be planning both by the instructor and by the learner so that efficient progress is made.

The planning has been going on for some time by your instructor. After a bit of mental gymnastics concerning what teachers might need to improve their outdoor teaching tools, certain plans were formulated. Obviously, outdoor experiences take precedence over lectures between four walls. Too often such lectures relate what could be done if one did it.

The outdoors provides many valuable learning opportunities, and certainly, that which can be learned outdoors should so be learned. The printed page about the outdoor world is a poor substitute for contact with nature. Life in a pond, under a rock, in a rotting log, flying through the air, in the grass or among the weeds can reveal more of life than books can.

After sessions with living things in the outdoors, near the school or in distant fields and along springs or stream, will require some work with reference books to get determinations of the material collected or observed. To use references to check on some items studied alone in a textbook is sterile and shallow in meaning. Some will say that text book study is better than nothing, but why settle for mediocrity of experience?

S.B.M.

News AND Notes

Ross Pushes For Dog Control

Roland Case Ross, long-time ANSS member from California, has urged that dogs be kept out of state parks. He points out that the scent released from a dog is a danger sign to wildlife within many yards of the pet, and that even dogs on a leash do much to frighten wildlife away from those areas in the park where people might otherwise see them. In order to get the most from the experience of camping and visiting natural areas, he urges that dogs and cats be prohibited.

Dogs are likewise often a nuisance to people in the parks, being noisy, and adding unsanitary filth to the campground areas. ANSS members are urged to push for restrictions on pets in natural areas.

Western Section Meets

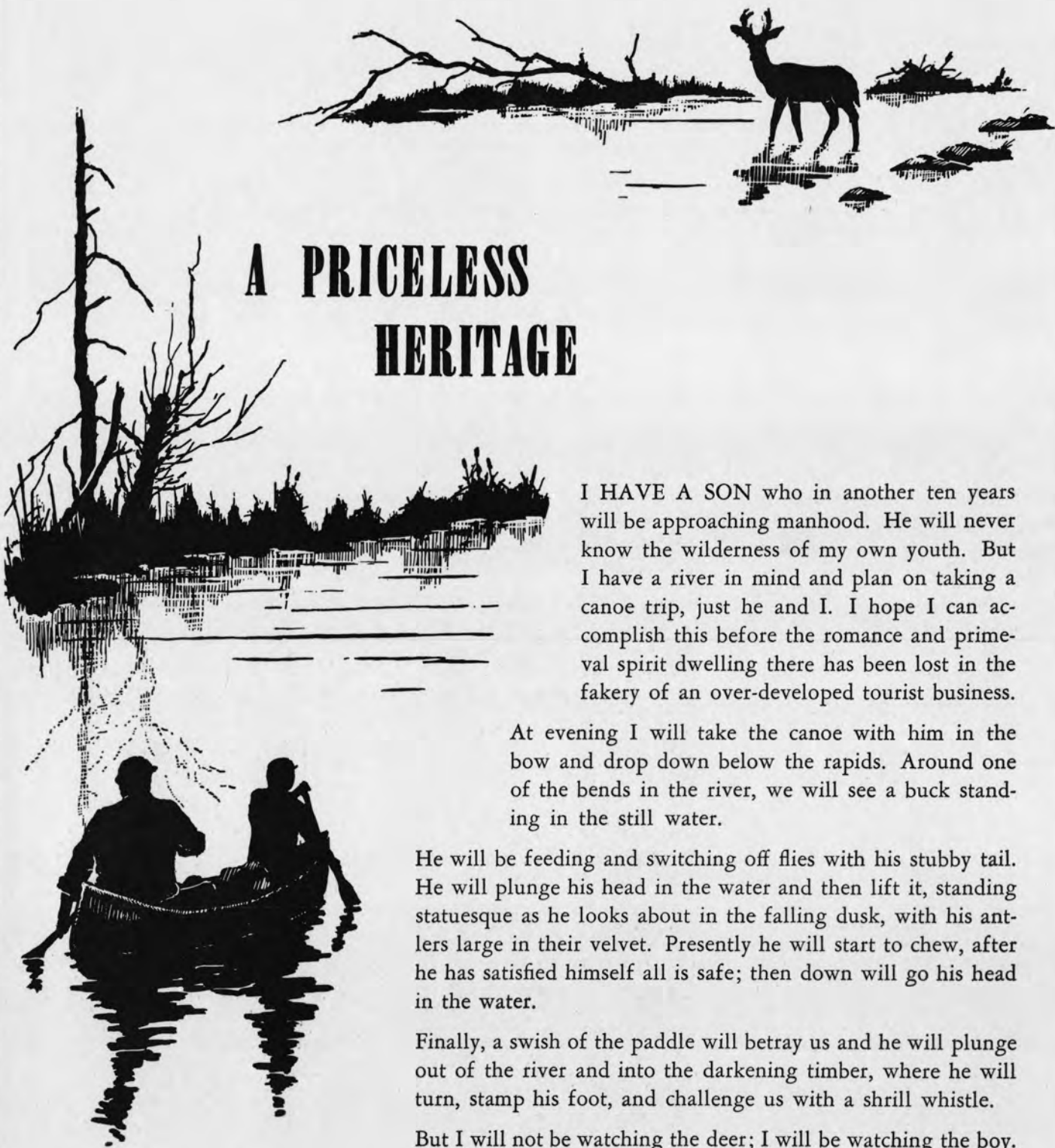
Mrs. Dorothy K. Platt, president of the Western Section and of the newly created Utah Section of ANSS announces a good program of papers and a Kodachrome evening on Friday, August 22 and a field trip on Saturday, August 23. The meetings will be held at Pullman, Washington in conjunction with the Pacific Division of the American Association for the Advancement of Science.

The Utah section is planning several field trips to nearby canyons and other areas of interest. One of these will take the group to visit the Granddaddy tree near Centerville which at breast height measures 22 feet, seven inches in circumference. This is seemingly a Fremont's poplar, though there are some suggestions that it might be a hybrid with the great plains poplar.



E. Lawrence Photo

The outdoor world is more real than books and libraries.



A PRICELESS HERITAGE

I HAVE A SON who in another ten years will be approaching manhood. He will never know the wilderness of my own youth. But I have a river in mind and plan on taking a canoe trip, just he and I. I hope I can accomplish this before the romance and primeval spirit dwelling there has been lost in the fakery of an over-developed tourist business.

At evening I will take the canoe with him in the bow and drop down below the rapids. Around one of the bends in the river, we will see a buck standing in the still water.

He will be feeding and switching off flies with his stubby tail. He will plunge his head in the water and then lift it, standing statuesque as he looks about in the falling dusk, with his antlers large in their velvet. Presently he will start to chew, after he has satisfied himself all is safe; then down will go his head in the water.

Finally, a swish of the paddle will betray us and he will plunge out of the river and into the darkening timber, where he will turn, stamp his foot, and challenge us with a shrill whistle.

But I will not be watching the deer; I will be watching the boy. He is not only my son, he is Youth. As the spell of this scene slowly leaves him, I hope he will turn about and look at me. And looking into his eyes, if I can see reflected that glow of light which goes with love of wild creatures, woodlands and running water, I will be content.

Ernest Swift

AMERICAN NATURE STUDY SOCIETY

Mrs. John Geisler, Secy.

Milewood Rd.

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John J. Padalino

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COMMON SENSE NEEDED

Is it necessary to expect civilization to be saved only out of crisis exploding on every hand? Is it necessary to allow degradation to proceed in terms of air and water and soil pollution to where action on a massive scale must be taken? Man must be saved from himself. Man is at war with himself systematically destroying elements of his environment which he understands only vaguely as necessary for his survival.

Is mankind approaching the condition expressed by a military commander in a war where he considered it necessary to destroy a city in order to save it? Must man continue to destroy some elements of his environment to the point that he reacts violently in desperation to save some semblance of the good life he knows he could have had all the time?

Why must he be encouraged to continue breeding his kind to create mouths to consume more foods and to provide minds brainwashed to demand more consumable goods being ground out for the glory of the gross national product? Shouldn't man review the environmental degrading which has resulted from modern technology? There is an elemental sanity to recover before it is too late.

The history of mankind abandoning the farms and small agricultural-related rural communities in the recent decade is clear. The rotting centers of our cities provides a way of life that is not wholesome, and for which the human is not prepared psychologically, socially, or economically.

Throughout America and throughout the States we hear cries that our production of goods, of roads, of houses, and of foods be stepped up to speed up the growth of population in the name of prosperity and of progress. Shouldn't the Governor, Chambers of Commerce and others take a stand against present trends and plan in a statesman-like manner for a quality life and a quality environment?

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