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OUTDOOR EDUCATION AT SANDY HOOK

by RICHARD C. COLE ●

As America becomes an urban nation with the greater portion of the population concentrated in the city and suburban areas, it is inevitable that the vast multitudes of our population will lose all touch with the natural features with which our country abounds. Even if many of the people are brought into contact with the great outdoors, a large number have no understanding of the complexities of nature, and therefore cannot fully appreciate the gifts which nature spreads so lavishly before them.

If our country is to remain a strong and united nation, it is important for everyone in the country to see, understand, and appreciate the natural bounty of our continent. By developing this understanding and appreciation, citizens of our nation will be better able to assist in formulating a basic policy for sound use of private and public resources. The proper interpretation of a basic policy, would assist in the preservation of our resources for present and future generations.



● Mr. Cole, director of the Middletown Township Outdoor Interpretive Programs, received a B.A. degree in Biology at Gettysburg College, an M.A. degree at Seton Hall University, and has completed graduate work at Rutgers University and Fairleigh Dickinson University. He is a member of Kappa Delta Rho and Kappa Phi Kappa Fraternities. He spent several years as a meteorologist in the United States Air Force. Mr. Cole, a former resident of Gettysburg, Pennsylvania, has resided in Middletown, New Jersey for the last nine years. He was a science instructor at Middletown Township High School for eight years. He received the "Teacher of the Month Award" from the Theobald Smith Society in 1965.

Among his many professional activities, Mr. Cole author of "Sandy Hook Urban Wilderness" has written numerous articles for newspapers and periodicals. Mr. Cole was selected to participate in the recent Summer Seminar on Innovations in Education held in Hawaii. Mr. Cole instructs summer courses in Marine Biology and evening adult programs. A veteran lecturer, he has presented hundreds of programs to organizations in the past several years. An active participant in conservation activities, he is a member of the American Littoral Society, Monmouth Conservation Council, Monmouth Nature Club, Theobald Smith Society, and the New Jersey Outdoor Education Association.

Park interpretation programs are but a small step forward in what must eventually become a massive educational effort. If however, an individual park interpretation program reaches out and influences even a minor number of our visitors, the program can be considered successful. A major program goal would be in broadening the viewpoint of even a comparatively small segment of our total population. This change in viewpoint will start an educational process which will result, ultimately, in reminding the great

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A fourth grade class examines drifting sand along shoreline.

masses of urban citizens of their all but forgotten natural heritage.

Sandy Hook State Park, because of the unique position it occupies, is ideally suited as the base for park interpretive programs. This unusual area is located sixteen miles due south of Manhattan, fifteen miles east-southeast of Perth Amboy, and lies in the northeast corner of Monmouth County, New Jersey. On September 2, 1609, Robert Juet, an officer on Henry Hudson's ship the "Half Moon," recorded the following description of the Sandy Hook area — "This is a very good Land to fall with, and a pleasant Land to see."

Sandy Hook and the surrounding area has long been used by geologists as a classic study of barrier beach development. The six mile long Sandy Hook Spit (or "Hook" because of the curved tip), is one of the few of its type in all of our continental coastlines. Within this "Urban Wilderness" area biologists and conservationists find numerous natural habitats. These natural areas have been preserved by many years of protection within the military reservation.

Until recently only a privileged few could enjoy the natural assets of the Sandy Hook area. This area's strategic position in controlling the entry channels to New York Harbor, and more recently as a home for the Nike coastal defense system, has left the area restricted to all but governmental personnel. Sandy Hook's location and resource potential has kept constant pressure on governmental agencies to release all, or portions of, the area for recreational, commercial, and/or other uses. Requests, from 1850 to the present, ranged from ferry docks, aquarium locations, fishing lodges, to summer resorts. In 1936-37, individuals, organizations and the State of New Jersey, recommended that a portion of the "Hook" be released by the military and converted into public park and recreational facilities. New Jersey Governor Richard J. Hughes succeeded in obtaining a lease from the Federal government in 1962 for 460 acres located at the base of the 1,634 acre federal tract. In 1964, an additional 285 acres were leased, but not yet utilized, by the State. To date, the Park provides parking for 3,500 cars, bathhouses at two beach sites, comfort facilities, and parking for fishermen at the south end of the park area. In addition, the State provides conservation-education programs for schools, colleges, and universities, as well as interpretive programs for the visiting public.

Nature Program Development

My first involvement at Sandy Hook started in 1962, when at the park's inception, I was employed as a naturalist to plan and conduct a park nature program. At the time, naturalist work was a "moonlighting" experience. My full time position was that of a science teacher at nearby Middletown township High School. Summers, evenings, and weekends were spent at the park in program development. Park Superintendent Richard L. Riker, under the direction of Commissioner Robert A. Roe, New Jersey Department of Conservation and Economic Development, assisted me in formulating Sandy Hook State Park's plan for natural area development. After a comprehensive study, supplemented by prior natural surveys of the area, plans were submitted for three nature trails. These trails were planned so that park nature guides could best display to the public the varying ecology of the area. The trails covered the following zones: (1) beach ecology and dune conservation, (2) the flora and fauna of the Holly Forest, and (3) marsh, estuary, and bay ecology.

(Continued on page 27)

The Mill With The Overshot Wheel

Temple of Ceres

Hereto, from Her bountiful breast,
sweet Mother Earth sends golden grain
to spread upon the altar of mankind.

Yet more She gives—

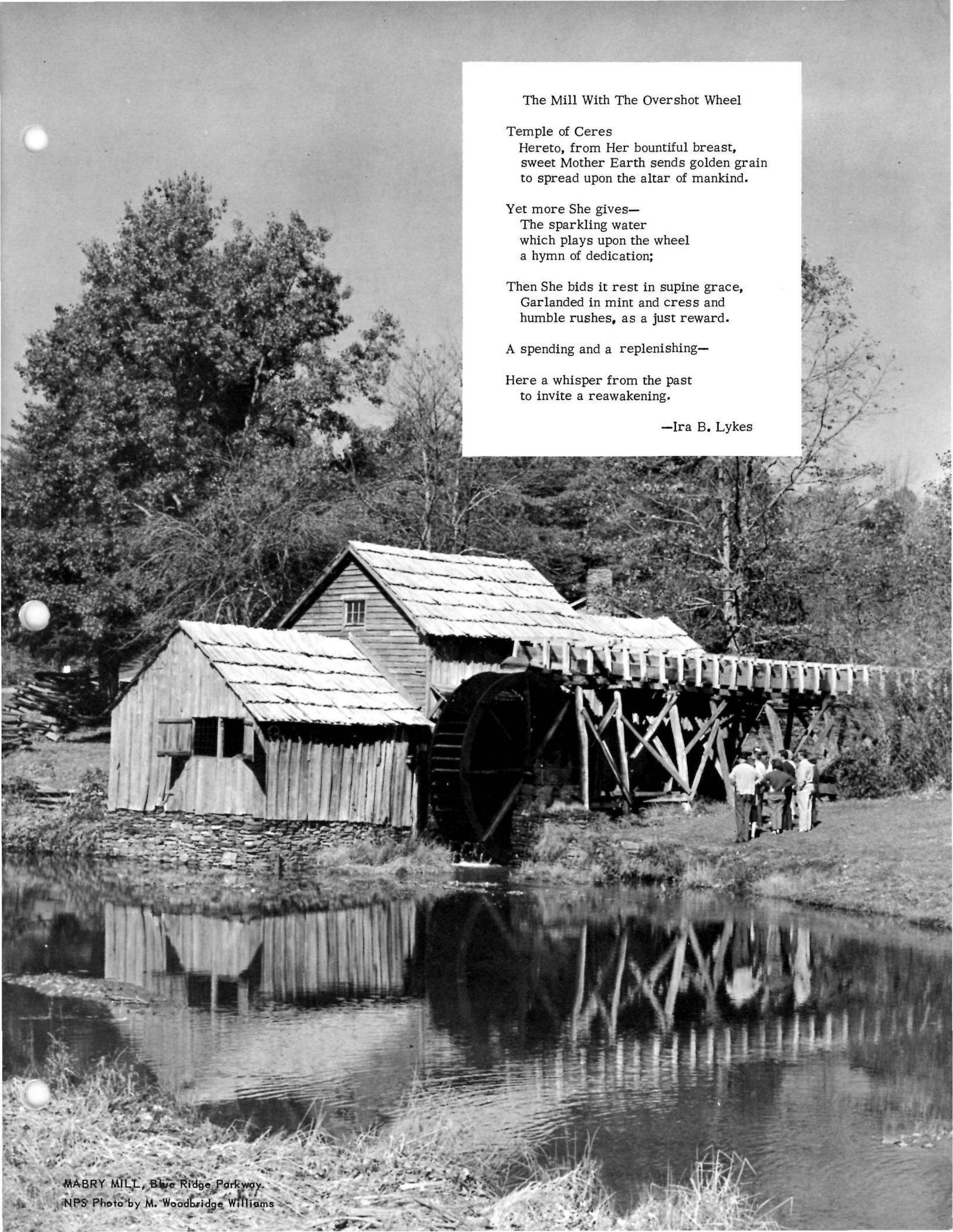
The sparkling water
which plays upon the wheel
a hymn of dedication;

Then She bids it rest in supine grace,
Garlanded in mint and cress and
humble rushes, as a just reward.

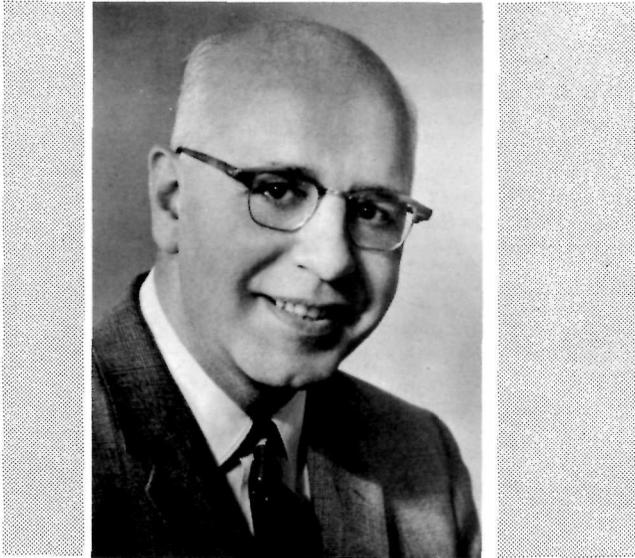
A spending and a replenishing—

Here a whisper from the past
to invite a reawakening.

—Ira B. Lykes



MABRY MILL, Blue Ridge Parkway
NPS Photo by M. Woodbridge Williams



A GUEST EDITORIAL

By Dr. Sal J. Prezioso, Executive Vice President
National Recreation and Park Association

Park and recreation executives must provide quantitative as well as qualitative recreation experiences and opportunities if we wish to capture and retain the interests of our park users—our people—all people—of all ages—who have varying interests, desires, and requirements. A balanced set up of programs, services, and facilities catering to the active and passive interests of people is a desirable goal.

Responsibility for providing such opportunities rests with the public sector and the private-voluntary park and recreation agencies. It is therefore imperative that cooperative and coordinate action be attained and that there be an understanding relative to the respective levels of responsibility for each sector.

Our changing times have brought a change in the needs of people and unless we recognize, consider and give attention to these matters we will fail to keep pace with our people, the users of our parks.

As a guest in the editorial column of *TRENDS*, I would suggest that we seek answers to some current questions that are of vital importance to the park, recreation, and conservation field.

Park professional people have come of age. They are ready and trying to face up to the myriad problems of providing meaningful recreation experiences to millions of park visitors without cheapening the experience that visitors seek.

Question Are we moving in the right direction to find the answers to our problems and to elicit tomorrow's best potential talent?

As we look around us in the parks throughout the nation, we see retention and repetition of many old designs. Doubtless, when they first caught the imagination they were the best solutions of their time. But times and conditions have changed. Unfortunately many of our professional park and recreation executives seem to resist change. As a result we seem to be maintaining the status quo relative to design of our parks.

Question Who is preparing for the more sophisticated, advanced park use and facility designs that will be needed by tomorrow's park users?

In park use we are moving from passive recreational pursuits to active. This is healthy, especially for the increasing multitude of young people. They need activities. Simultaneously, the span of individual life is being lengthened by improved care. There is an increasing multitude of not-so-young people who appreciate and enjoy the quiet majesty of the earth and the sky and the human spirit that still may be found in many parks. People also need aesthetic and inspirational response. Therefore our park designers must find ways and means of making our parks multifunctional.

Question What are we doing to find and keep the best balance in the satisfaction of these diverse needs?

We should not look to government to provide all outdoor recreation opportunities. Private properties and private endeavor can and should provide a large measure of opportunities for varied and personal aesthetic experiences of kinds that may not be obtainable by government. The private sphere, however, needs incentives such as tax benefits, zoning permanence, scenic easements, and protection from vandalism—among others—if it is to offer both quality and quantity recreational opportunities that are needed to supplement those offered by government. Unfortunately, available incentives are few and as a result philanthropy has been held to a minimum. Our park and recreation executives must alert and stimulate our legislators into action.

Question What should we do to determine and provide the proper incentives for the private sphere?

The character and routes of our present-day public highways are of importance for all of us. They no longer blend, like trails, into the landscapes and villagescenes as they did for thousands of years. Now they are laid across the face of the land as rigid grids. To some engineers, the shortest distance is a line through two state parks. We need a massive educational program to gain the attention of and cooperation of our people and elected officials.

Question What should we do to help make public highway planning more consonant with aesthetic and other human values?

Park roads and parkways—roads built to land contours for leisurely travel through parks—have led to “scenic roads” to take large numbers of motorists quickly through pleasant country to vista points and other recreational destinations. In this motor traffic evolution the distinct merit of the simple park road seems to be vanishing into the smog of arterial motor traffic. Planning for highways requires total community involvement and the highway plan should be considered but a part of the total community plan.

Question How can we keep the quality of leisurely travel on park roads? Are we sacrificing values needlessly in building more scenic roads?

Acquisition of lands for new parks preserves more scenic, historic, and other outdoor recreation values. This is necessary and, in most cases, time is of the essence. But there are also many opportunities to enhance the potential values of existing park properties by making them more useful in terms of human satisfaction. Many agencies are hard pressed to preserve and provide properly for public use of the parks they already have. The design and type of construction of any road must differ with reference to objectives and use. Each road has a purpose which park designers must respect and take into consideration. Leisure travel or high speed travel on any road is governed and controlled by its design. More scenic roads enhance aesthetic values and do not detract from the environment.

Our park and recreation executives together with our conservationists must be alert to the problems and seek alternative courses of action in order to meet the needs of tomorrow. Failure so to do will stagnate our parks and recreation systems.

W. J. Davidson



SATOUR (South African Tourist Corp.) Photos



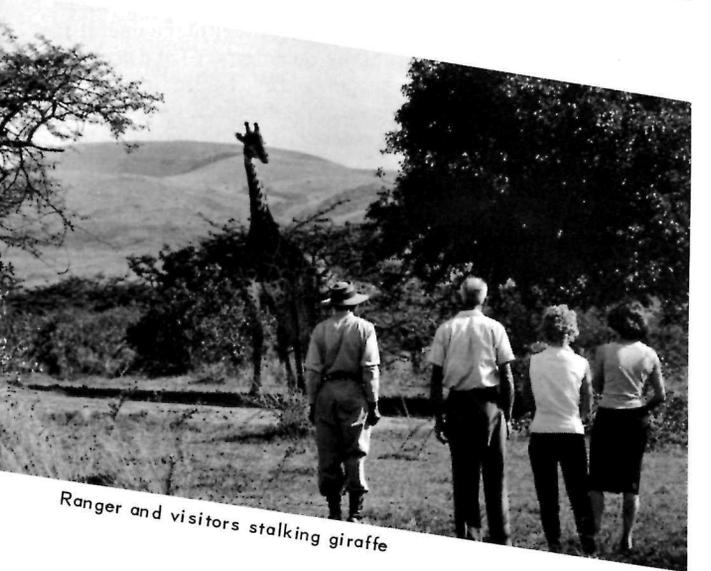
Overnight camping on a wilderness trail, Umfolozi Game Reserve



A tree house at Mala Mala Game Reserve



Orpen Rest Camp, Kruger National Park



Ranger and visitors stalking giraffe

Trends in Nature Conservation in South Africa:

TOURISM

by JOE MÖLLER •

The South African nature conservation authorities are convinced that Parks are there for use by man. Conservation aimed solely at protection simply does not exist. It is one of nature's immutable laws that nothing can exist unless it is used in some way. There is not a single passive constituent in nature — everything is continually being used or using something else.

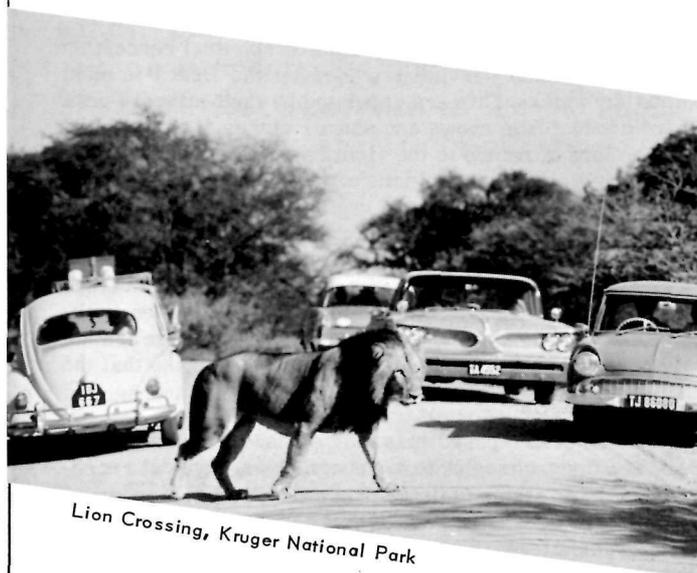
In man, this characteristic is much more marked. History has shown time and again that what man could not immediately use, he destroyed — or at least most men did their best to destroy such things. Therefore, in order to ensure the continued existence of Parks and Reserves, they must be wholly or in part accessible and usable by the man in the street. If not, it is quite conceivable that he would start advocating the abolishment of parks and the establishment of something with tangible value to him in their place.

The use of a park — or, for that matter, nature as a whole — must however be regulated and given direction. There are two parallel lines along which the use of a park by man may be guided: the purely physical line and the spiritual line. Since the two lines are parallel, it is entirely possible to work along both at the same time — with emphasis on one or the other, as circumstances demand.

The National Parks Board believes that in the modern world, people have more need of spiritual recreation in nature than of physical recreation. After all, even though a man lives in an apartment, he is still free to run up and down the staircase or to take a brisk walk around the block for exercise.

Spiritually, however, man needs nature — the silent inexplicable communion with his origin. For all the millions of years it had taken man to develop to his present status he had been in close contact with nature in an interdependent way. Only during the last few thousand years has man learned not to be dependent solely on what nature, left alone, could produce. He learned that he could produce his own food. Then, only in the past few hundred years, has man come to the stage where his social organization forces large numbers of people to live away from nature in artificial environments — where his home is not just a small speck on the landscape, but where his home utterly destroys nature. He has now cut himself adrift from nature. But as a sailor adrift wants to return to land, man wants to return to nature. This urge is clearly demonstrated in man's attraction to the suburban garden.

• After graduating at the University of Pretoria, South Africa, in 1962, Joe Möller took up journalism as a career. While engaged in this he became acutely interested in nature conservation through being placed on his paper's "conservation beat," and was eventually — in 1965 — appointed Assistant Liaison Officer to the National Parks Board of Trustees of South Africa. In this capacity his main task is dealing with the press.



Lion Crossing, Kruger National Park

In relation to the aeons of time it has taken man to evolve to his present status, the few hundred years that he has been partly separated from nature is an almost inconsiderably minute period. Man--like a child away from home for a few days--has not had the time to forget his home. He yearns to return to nature.

But man is also a gregarious animal. The happiness he feels upon returning home after a long absence stems primarily from the fact that he is returning to a certain companionship. And it is this companionship, this feeling of having come home, that the National Parks Board is trying to foster.

To create this atmosphere it is necessary that visitors to the various parks be as close as possible to nature. For this reason, camps--which are all in the parks--are kept small and visitors' figures low. Visitors are not accommodated in hotels or other large structures where large numbers of people are heaped together as though they were back in the cities. Visitors are housed in small units, each accommodating a single family or less, and these units are always spread over a large area.

Apart from all this, camps are kept far apart so that urbanization is absolutely impossible. In the bigger parks like the Kruger National Park and the Kalahari Gemsbok National Park, camps are as far as 75 miles apart.

In the smaller parks, the camps are, of necessity, closer together. But if a small park has more than one camp, each camp must be made proportionately smaller.

The consistent use of the word "camps" in connection with tourist accommodation may sound strange to some people, but true to the ideal of bringing people as closely in contact with nature as possible, these places are never allowed to achieve an urban atmosphere. They must always remind one of the temporary imposition made on nature by the habitations of primitive man -- even though they are much more permanent structures.

In these camps the visitor may cook his own food, which he either brings along with him from home or buys in the shops in each camp. In some camps, gas stoves are provided for his comfort; in others, simple open fires with a grate over them. On the other hand, if the visitor so prefers, he may have his meals in well-appointed restaurants where he can dine in style. The whole system lends itself to an easy general supervision of the camp. In fact, the atmosphere of a camp can be steered the way the Parks Board would like it to go.

Part and parcel of the emphasis on spiritual recreation is the educational service provided by the Board in most camps and parks. Officers appointed by the National Parks Board conduct film shows and short lectures at night to impart the lore of nature to the visitors -- some of whom know surprisingly little about nature. The attendance at these shows is good, usually in the region of about 80 percent of the visitors in camp. Audience participation through discussions and questions is encouraged. These film shows and lectures take place in the camp itself, and in most camps and parks special educational facilities have been built. Museums are being provided in several parks. These are not only natural history museums, but also cultural, so that the visitor can reconstruct the way of life of the pioneers of that area.

Man is not composed of spirit alone. He has a body as well, and the parks cater to it. Nevertheless, physical recreation is never allowed to take precedence over the spiritual. In fact, in two parks controlled by the National Parks Board, the aforementioned Kruger National Park and the Kalahari Gemsbok National Park, the emphasis is on spiritual recre-

ation to the complete exclusion of the physical. Because of the presence of dangerous animals within these parks, the visitor is not allowed to go outside the camp fences on foot. In reality the animals are only dangerous when scared or angered by something, but it is very easy for the novice to frighten the animals quite unintentionally. Therefore, in these parks the visitor is never more than a passive observer or onlooker. He has to get to know things solely by looking at them and hearing about them. Circumstances make any other approach impossible.

In the smallest of the nine National Parks in South Africa the emphasis is on the physical aspects of recreation. In all these parks the visitor can walk around on his own, getting intimately in touch with nature while catching up on his exercises as well. He may hike along special trails or perhaps explore the area on horseback, going by himself or with an organized group.

In some parks, like the Golden Gate Highlands National Park, sport facilities are provided. Here the visitor can play tennis, bowl or golf on fields of a very high standard. There is a large swimming pool for those interested in water sports and a mountain lake brimming with trout for the fishing enthusiast.

The one note that runs throughout this article is this: that the National Parks Board does everything in the parks on its own. There are no concessions for trading, accommodation or any other commodity. Since the Parks Board is a non-profit, semi-government organization, every cent that comes in is ploughed back into nature conservation. There are only over-heads to meet, as it is not necessary to pay out dividends to shareholders. In some instances, this circumstance has led to charges being almost ridiculously low, but it is the outspoken opinion of the National Parks Board that the parks are the people's property, and that, as such, everyone should be able to afford a holiday in the parks.

The relatively low charges, coupled with the deliberate limiting of the number of visitors may lead to the not unreasonable supposition that the National Parks Board is heavily subsidized by the Government. This, however, is not the case. Less than 12 percent of the Board's annual budget is derived from subsidies. The remainder comes from the collected revenues. Thus, it would be utterly impossible for the system to survive without putting the small profits back into nature conservation.

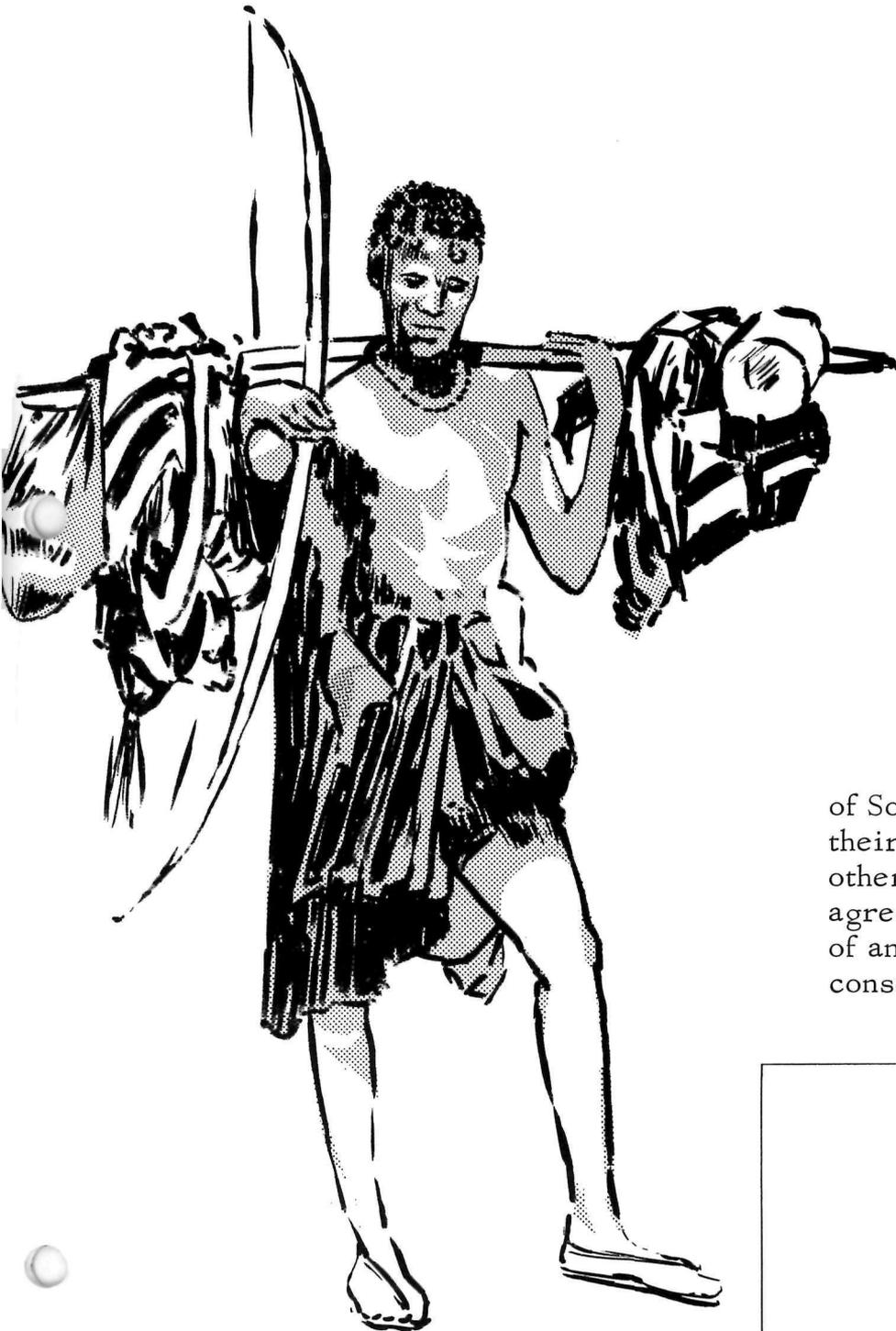
The limitation of the number of visitors and the size of camps has one serious drawback: not everybody who wants to visit a park -- especially during school holidays -- can get in. An efficient booking system takes care of this problem. The system does not work on a first-come, first-served basis. On a certain date all the applications for accommodation for the season are put together. By a random selection of applications, accommodations are booked until all have been allocated. In periods not falling on school holidays, none of the parks is ever really fully occupied. But it is generally difficult to find accommodations for a large group on short notice.

It may be of some interest to note here that at least fifteen to twenty percent of all foreign tourists in South Africa visit one of the National Parks. Since many of them would not have visited South Africa at all were it not for the existence of the National Parks, it is clear that the National Parks are largely responsible for the inflow of foreign exchange.

Trends in Nature Conservation in South Africa:

RESEARCH

by JOE MÖLLER •



Whenever there are several bodies dealing with the same subject there is bound to be a great divergence of policy. Nature conservation in South Africa is no exception to this general rule. There are six major independent bodies dealing with nature conservation in South Africa: the National Parks Board, the Provincial Administrations of the four provinces and lastly the Administration of South West Africa. However much their policies may be at variance in other respects, on one aspect they are agreed: that research is the backbone of an efficient system of nature conservation.

• After graduating at the University of Pretoria, South Africa, in 1962, Joe Möller took up journalism as a career. While engaged in this he became acutely interested in nature conservation through being placed on his paper's "conservation beat," and was eventually—in 1965—appointed Assistant Liaison Officer to the National Parks Board of Trustees of South Africa. In this capacity his main task is dealing with the press.

Research in South Africa is becoming less localized and more generalized in its applications. This is primarily because of the scope of research projects carried on by the National Parks Board and the type of natural areas under study.

Although all of the nature conservation bodies do a large amount of research, it may be said freely that the most important general projects are being undertaken by the National Parks Board--the only national body of the lot. The reason for this is that the National Parks Board always has to keep in mind all the parks administered by it and how each of these various parks would benefit from research done in a particular park.

For further understanding, it is necessary to examine the types of areas under study. There is no game reserve or park in South Africa which forms an ecological unit, but the ones most closely approaching this ideal are under the control of the National Parks Board--the Kruger National Park and the Kalahari Gemsbok National Park. Both are huge, Kruger being about 8,000 square miles in size, and Kalahari Gemsbok, about 4,000 square miles.

Although the trend is away from localized research, research projects with a peculiar significance must be undertaken in order to make the work complete.

None of the natural areas, excluding Kruger National Park, has resident scientists, because of the general shortage of scientists in South Africa. Most of the nature conservation bodies in the country are obliged to co-opt researchers from the universities and other institutions to do part-time research in the parks and reserves. The National Parks Board is no exception. Nevertheless, the co-opt system has been found to function admirably.

Research into all facets of nature has been or is being undertaken. This research has resulted in the realization that the parks and reserves must be farmed, both as a tourist resource and as a source of protein.

With the absolute protection enjoyed by the animals in the parks and reserves, man is no longer the predator. Instead, he must work to restore the correct proportion of the various animals to each other. This, however, cannot be done without an exact knowledge of the types and locations of wildlife. To gain this knowledge, the parks have resorted to the use of aerial censuses and have shown that the traditional methods of estimating the numbers of animals in various areas were highly inaccurate.

In the past few years the aerial census has been developed as one of the most powerful tools in the hands of the biologist for determining the number of animals in any given area. From his previous studies, the biologist knows what the carrying capacity, the so-called bio-mass potential, of an area is. By comparing the carrying capacity with the results of the census, the biologist can tell whether an area is under- or over-populated.

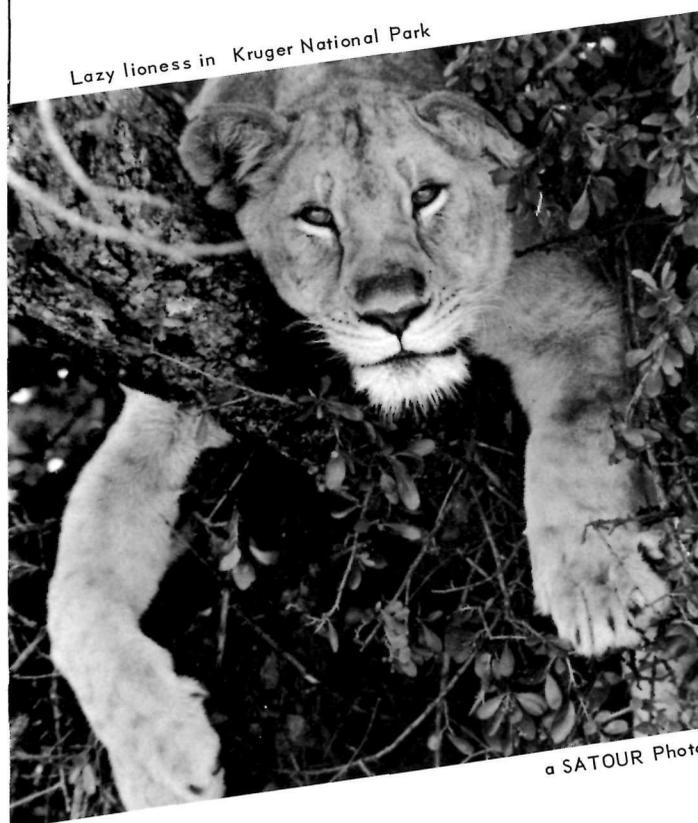
Next, the scientist must evolve means of either increasing or decreasing that population, or, if necessary, stabilizing it, perhaps by such methods as the artificial provision of water. There is only one sure way to effectively increase the numbers of animals in any area artificially, and that is to bring in other animals from other, and perhaps over-populated, areas. When the numbers have to be decreased, however, two methods may be used: either the animals may be culled with fire-arms or captured and taken away.

At the present, the only practical solution to the problem of over-population of certain species in certain areas, even though there may be a corresponding under-population of the same species in another part of the park, is culling

by fire-arms. To make any difference in the numbers of animals in any given area, such as Kruger National Park, literally thousands of animals would have to be either brought in or taken out. The problems inherent in the capture and transportation of a great number of animals are tremendous, and, therefore, the fire-arm culling method has been accepted for the time being.

Nevertheless, one cannot just go out and shoot everything in sight. The National Parks Board is a conservation body, and not a hunting club. Exact information concerning the concentration points of the game, and, whenever possible, the sex-age ratio of the herds must be obtained before culling is instigated.

A serious over-population of hippos, which resulted in the hippos fighting and killing one another, occurred in the



Letaba River in 1964. More than one hundred hippos had to be shot indiscriminately in order to safeguard the herds. As unfortunate as the situation may have been, it made possible the establishment of a sex-age quota for future cropping projects, if, and when, necessary.

The same information must be obtained regarding giraffe, elephant, buffalo, zebra, blue wildebeest, and other animals. The aerial census or survey is excellently suited to this purpose, and for the first time the National Parks Board is able to state with reasonable accuracy what the sex-age ratio in a culling project should be. Culling operations are now highly selective.

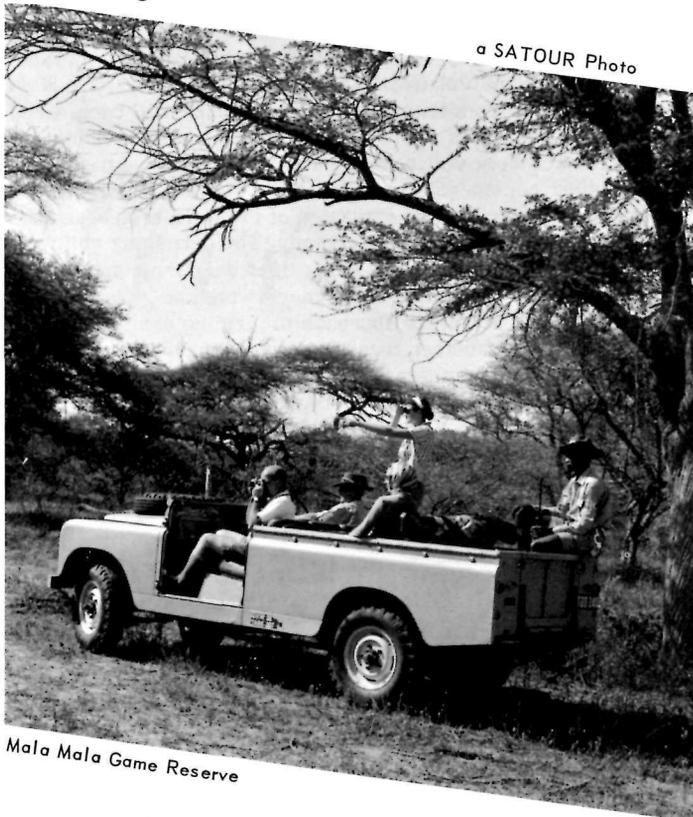
When small numbers of game are to be removed from a certain area, they must be captured. The mortality rate must be pruned to the absolute minimum, and now the parks rely heavily on the use of drug-darting. Although the mortality in the capture of zebras with nets has been pruned down to the absolute minimum--as low as five percent--it is doubtful whether this low figure could be maintained in

long-term operations involving thousands of animals.

The introduction of drug-darting and capture has, however, many purposes other than purely the removal of certain species from over-populated areas. Research on the use of drug-darting has shown it to be one of the most useful methods available for studying wild animals in the natural state without harming or killing them.

Drug-darting is commonly used to immobilize the animals for various reasons. Now they can be captured and marked for migration studies, or treated for injuries or disease, or examined for diseases communicable to domestic livestock, or used for other research purposes.

There is no doubt that dart-drugging has played an important role in the efficient management and study of the South African wildlife. A few of the many experiments with the drugs will be summarized below.



a SATOUR Photo

Mala Mala Game Reserve

In the past few years considerable advances were made in the use of immobilization drugs in the Kruger National Park.

Theoretical as well as practical use was made of this latest aid to Nature Conservation by the Biological Staff of this park.

With the aid of the range of M-drugs, game have been translocated and also marked for migration studies by the staff.

According to the Chief of the Biological section of the Kruger National Park, Dr. U. de V. Pienaar, it can now be said that his section is able to immobilize any of the larger mammals, from the tiniest antelope to an elephant, and even including some of the larger carnivores.

Loss of life has also been pruned down to the barest minimum, and with the aid of tranquilizing agents, transportation is no longer a hazard.

These M-drugs — related to morphine — were made available by a well-known drug company for experimentation. Recently samples of the same drug family were made available to the Parks Board's Biologists by a Belgian company.

A safe dose has been established for most wild animals.

Another project was then started by the Biological staff. They provided blue wildebeest and zebra with "neck-ties," as these durable and bright plastic collars were called, to study the movements of these migrational grazers in the Kruger National Park. The animals were first immobilized and then marked — a good example of the important role these M-drugs are playing in research into animal behaviour.

This knowledge is essential, as the massive movements of these migrators very often lead to overgrazing, and in time may prove to be disastrous to their habitat.

A total of 102 zebra and blue wildebeest were marked during 1964, and informative results are already being noted.

In 1965 more than a score of elephants were immobilized with the M-type drug and then marked to make a study of their breeding and migratory habits possible.

Two old warthog (Phacochoerus aethiopicus) moved into the main rest camp in the Kruger National Park, Skukuza. Although their behaviour was impeccable — at nights they slept inside a drain-pipe — they were immobilized and successfully transferred to an area where there was need for them.

A lioness severely injured in a fight was also immobilized and transported to the Biological headquarters in an effort to save her life.

For the first time in history sable antelope (Hippotragus niger) were successfully immobilized.

Two imported square-lipped rhinoceroses (Diceros simus) — which strayed out of the Park — were also immobilized and brought back into the reserve.

When a clinical pathologist wanted blood smears of live game for chromosome studies, blue wildebeest, zebra, kudu, buffalo, giraffe and waterbuck were immobilized, the blood drawn to prescription, and the animals released afterwards. Previously this would only have been possible through killing the animals — a method that could be extremely wasteful under certain circumstances.

In the past ten years the National Parks Board has re-established at least 25 different species of animals in areas where they had become extinct.

With the aid of the latest range of M-drugs, 39 giraffe were caught for the Natal Parks Board, without a single casualty. Some were subsequently released because of their



a SATOUR Photo

Elephants at Kruger National Park

size or other reasons, and the remaining 33 handed over to the Natal Parks Board in good condition, for transportation to Natal.

One of the most ambitious of the Parks Board's reestablishment programmes, was that carried out in the Golden Gate Highlands National Park in the Orange Free State, one of the most popular National Parks and holiday resorts in South Africa.

When the Board took over the Park in 1963 — before which it had been used for farming — nature had been stripped bare by civilization. A few species of animals had managed to survive the inroads of the worst predator the world had ever known — man. These species were grey rhebuck, mountain reedbuck, grey duiker, steenbuck, baboons, dassies, hares, antbears, otters, bushpigs, jackals and porcupines — without exception all very shy animals.

The Parks Board decided to re-introduce several extinct species in their natural habitat. These species were blesbok (*Damaliscus albifrons*), Black wildebeest (*Connochaetes gnu*), eland (*Taurotragus oryx*), red hartebeest (*Alcelaphus caama*), oribi (*Ourebia ourebi*), Cape Grysbok (*Raphicerus melanotis*), klipspringer (*Oretragus oretragus*), and Zebras (*Equus Burchelli*).

These species were all re-introduced at short intervals — several of them by the use of immobilization drugs and the others through the use of game nets.

In Golden Gate most of the indigenous animal species have been re-settled — largely through the research made possible and the opportunities created by the use of M-drugs. M-drugs then, can be considered one of the most important weapons in our continuous battle to preserve our heritage of wild life.

The trend in nature conservation in South Africa in the matter of research and the resettlement of animals in areas where they have become extinct has, as far as the National

Parks Board is concerned, in recent years been not only to bring back those animals, but also to bring them back to an area which is the same as it was before man changed it. Without exception all the National Parks in South Africa are located in areas which were partially or mercilessly exploited by man before the advent of the Parks. Cultivated and in some cases completely exhausted ground must be reclaimed and the ravages of over-grazing by domestic livestock in other areas repaired. In one case cultivation had so exhausted a cornfield that thirty years after it had been tilled the last time, there are no more than a few tufts of hardy pioneering grass on it.

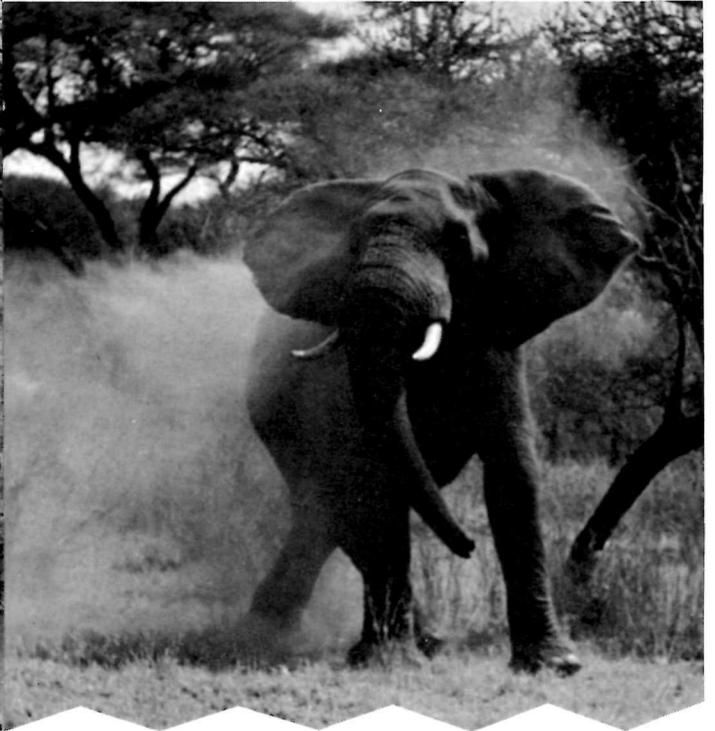
In other places overgrazing by domestic livestock changed the character of the land completely from sweet to sour or caused an infestation of worthless bush. Methods had to be found to eradicate this bush, and in both the Addo Elephant National Park and the Bontebok National Park work along these lines has progressed satisfactorily. The carrying capacity of the debushed veld at Addo is said to have been increased to from four to eight times what it had been. Land in this area costs about R35 an acre — and it is being debushed at a cost of not more than R10 per acre. Apart from all other considerations, economics argued in favor of debushing rather than an extension of the Park area — and the policy is paying dividends already. The debushing policy in Addo and its results are being used ever more frequently nowadays to illustrate to farmers what the rewards of a realistic and scientific approach to farming can be.

This then is another trend in nature conservation in South Africa as far as research is concerned: the application of research done in Parks to farming and other activities. So important has this aspect become, that an agricultural deputy cabinet Minister even said recently that farmers should not look upon land occupied by Parks and Game Reserves as land lost to the farmer, but as land gained by them.

Giraffes drinking at water hole, Kruger National Park



Charging Elephant, Kruger National Park



● John D. Cooper, Jr., was born in Malden, Massachusetts. He attended Staten Island Community College and was awarded the B.F.A. degree in Landscape Architecture from the University of Illinois in 1965.

Mr. Cooper has worked for the Illinois Division of Highways and for the Champaign Park District, Illinois, where he was Superintendent of Parks. Presently employed as a Landscape Architect with the Skokie Park District, Illinois, he supervises the Division of Landscape Design and Construction.

He is a member of the American Society of Landscape Architects, the National Recreation and Park Association, and the Midwest Institute Park Executives. He serves as chairman for the Maintenance and Design Committee, Illinois Park and Recreation Society.



HELLO NEIGHBOR

Glad to be in your neighborhood

by JOHN COOPER ●

Although that may be the feeling of the park district staff opening a new park, what is the reaction of the neighborhood residents?

The Skokie Park District has found that leaving residents of a neighborhood uninformed of proposed local park development, of the approximate starting and completion dates, and of some of the inconvenience encountered in park construction, simply isn't the neighborly thing to do. The residents of a neighborhood are entitled to know what their largest land holding neighbor is about to do. To inform the park neighbors of THEIR new park the Park District holds an open neighborhood meeting at a Neighborhood Recreation Center.

These meetings attract 35 to 50 residents, eager to see what the new neighborhood facility will be like, to ask questions and in general express their views. Letters of invitation are sent to the addressees at homes within one half block of the new development. The Director and I have established the following general format which is applied to all presentations. An introduction to the Park District consists of explaining its autonomy, its function in the community, and its goals, as presented by the Director. A resume of the District's Master Plan and how the park site being presented relates to the master plan, is the beginning of the Landscape Architect's presentation. Information obtained from a survey and analysis of the total neighborhood and the proposed park site is developed into a circulation and land use schematic plans of the new park. The schematic is sketched on tracing paper overlays which permits the gradual development of the design to be in evidence. This schematic consists of locating existing vegetation, topo-

graphical features, and other site conditions of the proposed park. Major use areas are then illustrated as circles on the schematic overlay (designating tennis courts, ball fields, play apparatus, shelter buildings, and the like) showing the relationship of one use area to another, and to the circulation pattern.

The overlays are then removed and a rendered general development plan is revealed, showing the actual park design in place of the abstract forms on the schematic. The presenting of the survey and analysis schematics is done to clarify at least three basic concerns; what, where, and why. That is, what facilities are to be included, where they are located on the site, and why they are in that particular location.

The residents are entitled to have answers to these questions, yet many Park Districts veer away from this type of a meeting because these questions are asked. We find at Skokie, that by basing the site design on sound planning principals, by conducting a detailed survey and analysis, and by considering future maintenance, a good design evolves that in itself, answers what, where, and why. By entering the neighborhood meeting with a sound design which has been thoroughly reviewed by the professional staff, armed with valid reasons for the plan and answers for the questions most commonly asked at such meetings, a well received presentation is possible. Of course, suggestions made by those attending the meeting that are deemed pertinent to the success of the development may be incorporated into the

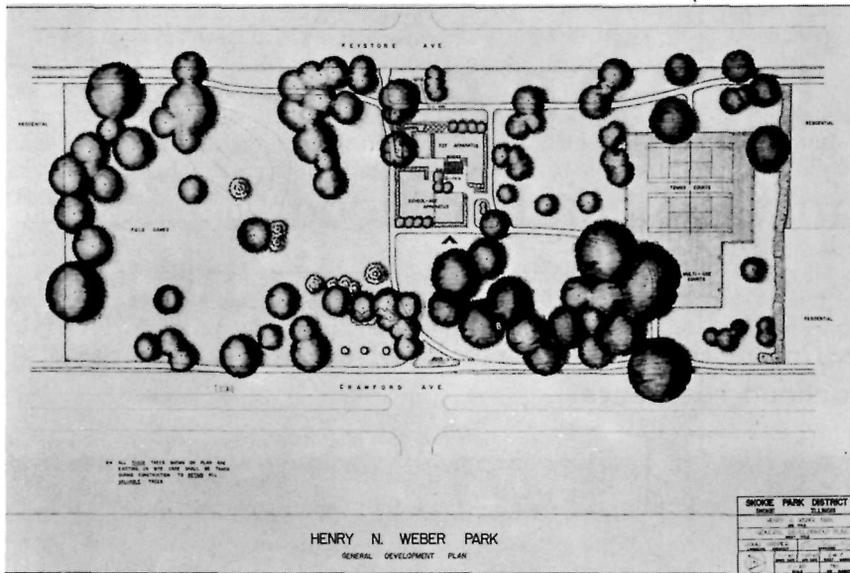
design. However, the well designed park will leave opportunity for only minor changes or additions.

Most people can read a plan—once it is described as a “birds eye view”—well enough to see where the various facilities will be located on the site and the advantages of the circulation pattern, shown on the general development plan. But, what the playground equipment areas will ultimately look like, what effect the plantings will have, and the details of construction, are not clarified with the use of the general development plan alone. For that reason perspective drawings of particular areas of the proposed park, usually playground areas and proposed structures, are a must for a complete presentation. When using a theme such as the “rustic-pioneer” motif shown in the Henry N. Weber Park perspective, drawings are even more important. Our presentation in Skokie also includes 12 color slides illustrating what is involved in laying drainage tile, constructing walks and tennis courts, grading and seeding. These slides were taken during previous park construction projects and are helpful when explaining that there may be some dust blowing, or why construction will require several months.

Basically this covers the format of a typical Skokie Park District neighborhood meeting. The presentation takes about twenty-five minutes, with the audience asking questions and commenting for another twenty to thirty minutes. Questions are sometimes asked that were covered in the initial presentation, which calls for a reiteration of the explanation. Some comments require answers based on established District policies, while others have no precedent and require verbal discretion in answering.

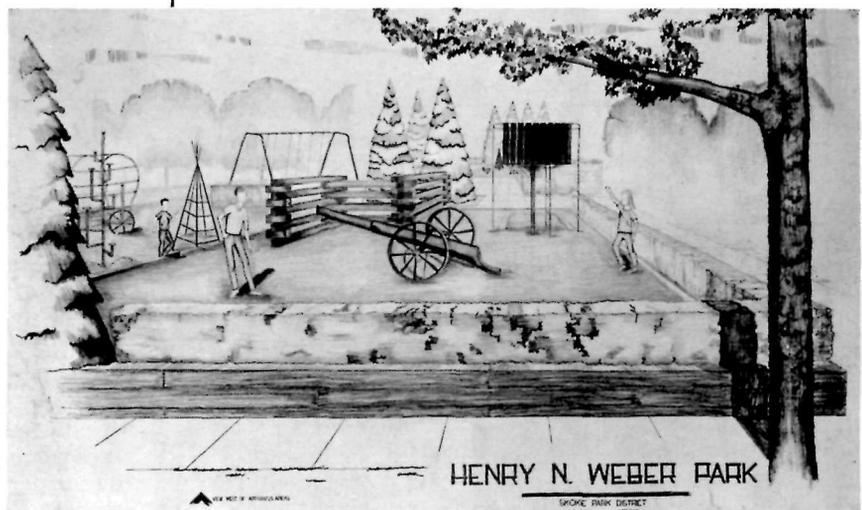
The tone of the presentation being dominating yet congenial; presenting a good site plan based on sound planning practices; using rendered drawings and plans; and, showing the construction slides are the elements making ours a coherent and valuable presentation.

Reception by neighborhood groups has been good. The residents are given the chance to see the layout of the park before construction, express their views, and above all the Park District makes the effort to include rather than ignore, from the beginning, the several dozen families that will be our neighbors. We have found the rapport established at these meetings carries over to a positive reception of the completed park.



Park facilities were placed in areas formerly occupied by buildings and a parking lot. By so locating the new facilities, existing evergreen and shade trees were retained.

Drawings such as this clarify what particular areas will look like upon completion of the project. Drawings are particularly useful when using “theme” equipment such as the “rustic-pioneer,” shown above.



Act No. 176

STATE
OF
INDIANA

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF STATE PARKS
616 State Office Building
Indianapolis, Indiana 46209

Indiana's fast acting 1967 Legislature has produced what may prove to be a landmark piece of conservation legislation. Restricted by its constitution to sixty-one day biennial sessions, the Hoosier State's General Assembly has not often been credited with authoring national legislative firsts. This year, however, State and private conservation agencies teamed-up with key lawmakers to draft a law, which is thought to be the answer to one of the Nation's most pressing natural resource management problems, that of providing protection for areas possessing unique natural

In brief summary, Indiana's 1967 Nature Preserves Act:

1. Provides for the establishment of a registry of areas possessing features of unique natural significance.
2. Establishes a procedure for the dedication of such areas as Nature Preserves.
3. Declares that areas so dedicated are put to their highest and best public use.
4. Provides that the Articles of Dedication may set forth any number of patterns of use and ownership.
5. Establishes a procedure for the amending of the Articles of Dedication based upon a specific finding of an unavoidable public need by the Indiana Natural Resources Commission.

In commenting on this significant achievement, John E. Mitchell, Indiana's Director of Natural Resources, declared that he does not believe that this law is perfect. "We just couldn't afford to sit around and wait for the perfect law to be developed, while some of our irreplaceable natural assets were being erased from the face of the globe," Mitchell commented. "The responsibility of this office demanded that we act before it was too late. So, with the aid of some of our aggressive, farsighted conservation agencies, we put a Bill together; and, with the help of what history will undoubtedly record as an outstanding conservation legislature and with the cooperation of Governor Branigin, our Bill has become law."

Director Mitchell foresees much hard work ahead in implementing the Nature Preserves Act. He likened the present position of his Department to that of a farmer preparing to plow new ground. "We don't know where the roots and rocks are under the surface; but we plan to plow a deep, straight furrow. We hope that the example that Indiana sets will inspire other dedicated agencies, both public and private to follow."

Joseph A. Blatt, Director
Division of State Parks

SENATE ENROLLED ACT No. 176

AN ACT creating a division of nature preserves establishing a state system of nature preserves providing for their acquisition, control, use, management, and protection, and making an appropriation.

Be it enacted by the General Assembly of the State of Indiana:

SECTION 1. As part of the continuing growth of the population and the development of the economy of the State of Indiana it is necessary and desirable that areas of unusual natural significance be set aside and preserved for the benefit of present and future generations before they have been destroyed; for once destroyed they cannot be wholly restored. Such areas are irreplaceable as laboratories for scientific research, as reservoirs of natural materials not all of the uses of which are now known, as habitats for plant and animal species and biotic communities whose diversity enriches the meaning and enjoyment of human life, as living museums where people may observe natural biotic and environmental systems of the earth and the interdependence of all forms of life, and as reminders of the vital dependence of the health of the human community upon the health of the natural communities of which it is an inseparable part. It is essential to the people of the State of Indiana that they retain the opportunities to maintain close contact with such living communities and environmental systems of the earth and to benefit from the scientific, esthetic, cultural and spiritual values they possess. It is therefore the public policy of the State of Indiana that a registry of such areas be established and maintained by the department, that such areas be acquired and preserved by the state and that other agencies, organizations, and individuals, both public and private, be encouraged to set aside such areas for the common benefit of the people of present and future generations.

SEC. 2. As used in this act: (a) The word "area" means an area of land or water or of both land and water, whether in public or private ownership, which either retains or has reestablished its natural character (although it need not be undisturbed) or has unusual flora or fauna or has biotic, geological, scenic or paleontological features of scientific or educational value.

(b) The term "nature preserve" means an area, any estate, interest or right in which has been formally dedicated under the provisions of this act.

(c) The words "dedicate" and "dedication" mean the transfer to the department, for and on behalf of the State of Indiana, of an estate, interest or right in an area in any manner permitted by section 6 of this act.

(d) The term "articles of dedication" means the writing by which any estate, interest or right in an area is formally dedicated as permitted by section 7 of this act.

(e) The word "system" means the nature preserves held under the provisions of this act.

(f) The word "division" means the division of nature preserves created by this act.

(g) The word "department" means the department of natural resources.

(h) The word "commission" means the natural resources commission.

Sec. 3. In order to secure for the people of the State of Indiana of present and future generations the benefits of an enduring resource of areas having one or more of the characteristics referred to in subsection 2 (a) of this act, the State of Indiana, acting through the department, shall acquire and hold in trust for the benefit of the people an adequate system of nature preserves for the following uses and purposes:

(a) For scientific research in such fields as ecology, taxonomy, genetics, forestry, pharmacology, agriculture, soil science, geology, paleontology, conservation and similar fields;

(b) For the teaching of biology, natural history, ecology, geology, conservation and other subjects;

(c) As habitats for plant and animal species and communities and other natural objects;

(d) As reservoirs of natural materials;

(e) As places of natural interest and beauty;

(f) As living illustrations of our natural heritage wherein one may observe and experience natural biotic and environmental systems of the earth and their processes;

(g) To promote understanding and appreciation of the esthetic, cultural, scientific and spiritual values of such areas by the people of the State of Indiana;

(h) For the preservation and protection of nature preserves against modification or encroachment resulting from occupation, development or other use which would destroy their natural or esthetic conditions.

In order to give recognition to natural areas, the Department shall establish and maintain a registry of natural areas of unusual significance, but no area so registered shall be a nature preserve unless and until it shall have been dedicated as provided for in Section 6 of this Act.

SEC. 4. There is hereby created within the Department a Division of Nature Preserves, which shall administer for the Department the provisions of this Act.

SEC. 5. In furtherance of the purposes of this act, the president of the Indiana Academy of Science is hereby made an ex-officio member of the commission in place of one of the lay members of that commission whose term expires June 30, 1967.

SEC. 6. The department is authorized and empowered, for and on behalf of the State of Indiana, to acquire nature preserves by gift, devise, purchase, exchange, condemnation or any other method of acquiring real property or any estate, interest or right therein provided that any interest owned by the state or by any subdivision thereof may be dedicated only by voluntary act of the agency having jurisdiction thereof. The department may acquire the fee simple interest in an area of any one or more lesser estates, interests and rights therein, including (without limitation upon the generality of the foregoing by reason of specification) a leasehold estate, an easement either appurtenant or in gross and either granting the state specified rights of use or denying to the grantor specified rights of use or both, a license, a covenant and other contractual rights. A nature preserve may be acquired voluntarily for such consideration as the department deems advisable or without consideration.

An estate, interest or right in an area may be dedicated by any state agency having jurisdiction thereof, by any other unit of government within the state having jurisdiction thereof, and by any private owner thereof. A dedication shall be

deemed effective, and an area shall become a nature preserve, only upon the acceptance of the articles of dedication by the department. Articles of dedication shall be placed on public record in the proper record in the county or counties in which the area is located.

With the approval of the governor and upon such terms and conditions as the department may determine, the department may, after the giving of notice and the holding of a public hearing as provided in section 9 of this act, enter into amendments of any articles of dedication upon a finding by the commission that such amendments will not permit an impairment, disturbance, use or development of the area inconsistent with the purposes of this act; Provided, however, that if the fee simple interest in the area is not held by the State of Indiana under this act, no amendment shall be made without the written consent of the owner or owners of the other interests therein.

SEC. 7. In furtherance of the purposes of this act and in implementation of the powers and duties elsewhere provided in this act, the department shall have the following additional powers and duties:

(a) To formulate policies for the selection, acquisition, use, management, and protection of nature preserves.

(b) To formulate policies for the selection of areas suitable for registration under the provisions of this Act.

(c) To formulate policies for the dedication of areas as nature preserves.

(d) To determine, supervise and control the management of nature preserves and to make, publish, and amend from time to time rules and regulations necessary or advisable for the use and protection of nature preserves.

(e) To encourage and recommend the dedication of areas as nature preserves.

(f) To make surveys and maintain registries and records of unique natural areas within the state.

(g) To carry on interpretive programs and publish and disseminate information pertaining to nature preserves and other areas within the state.

(h) To promote and assist in the establishment, restoration and protection of, and advise in the management of, natural areas and other areas of educational or scientific value and otherwise to foster and aid in the establishment, restoration and preservation of natural conditions within the state elsewhere than in the system.

SEC. 8. The nature preserves within the system are hereby declared to be held in trust, for those uses and purposes expressed in this act which are not prohibited by the articles of dedication, for the benefit of the people of the State of Indiana of present and future generations and declared to be put to their highest, best, and most important use for the public benefit. They shall be managed and protected in the manner approved by, and subject to the rules and regulations established by, the department. They shall not be taken for any other use except another public use after a finding by the commission of the existence of an imperative and unavoidable public necessity for such other public use and with the approval of the governor. Except as may otherwise be provided in the articles of dedication, the department may grant, upon such terms and conditions as it may determine, an estate, interest or right in, or dispose of a nature preserve, but only after a finding by the commission of the existence of an imperative and unavoidable public necessity for such grant or disposition and with the approval of the governor.

SEC. 9. Before the commission shall make any finding of the existence of an imperative and unavoidable public necessity, or shall grant any estate, interest or right in a nature preserve or dispose of a nature preserve or of any estate, interest or right therein as provided in section 8 of this act, or shall enter into any amendment of any articles of dedication as provided in section 6 of this act, it shall give notice of such proposed action and an opportunity for any person to be heard. Such notice shall be published at least once in a newspaper printed in the English language with a general circulation in the county or counties wherein the nature preserve is located. The notice shall set forth the substance of the proposed action and describe, with or without legal description, the nature preserve affected, and shall specify a place and time not less than thirty (30) days after such publication for a public hearing before the commission on such proposed action. All persons desiring to be heard shall have a reasonable opportunity to be heard prior to action by the commission on such proposal.

SEC. 10. All units, departments, agencies, and instrumentalities of the state, including (without limitation upon the generality of the foregoing by reason of specification) counties, townships, municipalities, public corporation, boards, commissions, colleges and universities, are empowered and urged to dedicate as nature preserves suitable areas or portions of areas within their jurisdiction.

SEC. 11. Nothing contained in this act shall be construed as interfering with the purposes stated in the establishment of or pertaining to any state or local park, preserve, wildlife refuge or other area or the proper management and development thereof, except that any agency administering an area dedicated as a nature preserve under the provisions of this act shall be responsible for preserving the character of the area in accordance with the articles of dedication and the applicable rules and regulations with respect thereto established by the department from time to time. Neither the dedication of an area as a nature preserve nor any action taken by the department under any of the provisions of this act shall void or replace any protective status under law which the area would have were it not a nature preserve and the protective provisions of this act shall be supplemental thereto.

SEC. 12. If any provision of this act or the application thereof to any circumstance is held invalid, such invalidity shall not affect other provisions or applications of this act which can be given effect without the invalid provision or application, and to this end the provisions of this act are declared to be severable.

SEC. 13. The sum of \$30,000 is hereby appropriated from the General Fund to the Department for the purposes of this Act.

SEC. 14. All laws and parts of laws in conflict herewith insofar as such conflicts exist, are hereby repealed.

SEC. 15. Whereas an emergency exists for the immediate taking effect of this act, the same shall be in full force and effect on its passage.



Grizzly Bear at Yellowstone National Park.

NPS Photo by William S. Keller

Excerpt from *The Anhinga*, published by Everglades Natural History Assn., October 1967 issue.

Concerning **DANGERS** in National Parks

by GALE KOSCHMANN ZIMMER ●
Everglades National Park



We have snakes here—four kinds of poison ones. And panthers, and alligators and bees and poisonwood and manchineel trees, and sharks in the salt water—those are our “dangers”. We’ve had very few “incidents” with them. I suppose the day will come when someone will really tangle with one and there’ll be a hue and cry but so far the visitors have managed to keep the right distance between them and the critters.

Glacier has grizzly bears and crevasses. Yellowstone has bears. Almost all parks have “dangers” and most of the time the “dangers” mind their own business and if you’re smart when you visit a park you find out what’s there and what it’s apt to do and then respect it and go about your business too. Most of the “danger” exists in peoples’ minds. Knowledgeable respect is one thing, fearful dread another.



● Gale was born in Washington, D.C., where her father was a geologist with the U.S. Geological Survey. The family moved to Denver where Gale grew up. She attended Colorado College and the University of Colorado, majoring in zoology, art and history. After receiving her degree, she worked for several years for the Boettcher Foundation in Denver, in the administration of their scholarship program.

In 1961 she joined the National Park Service at Everglades National Park as a naturalist.

In addition to editing and writing “*The Anhinga*”, which is published by the Everglades Natural History Assn., she has had a number of articles published in the “*National Parks Magazine*”, “*International Turtle and Tortoise Society Journal*”, “*Florida Planning and Development*” and local publications. She has authored one book on her special interest titled “*Turtle Lore*.”

But now and then things do happen. You can't have much sympathy for the park visitor who is told "don't feed the bears — don't tease the wildlife — don't handle the animals" and does it anyhow and gets clipped. When the Park Service tells you "don't" there's a reason besides just our being fuddy-duddy. But you can have the greatest sympathy for the innocent and respectful park visitor who gets hurt through no fault of his own. The grizzly incidents in Glacier this past summer, for example. But how can you feel retributive, vengeful, even in a case like that? Maybe it's odd but I can't damn all rattlesnakes because now and again somebody gets bitten or support the shooting of bears because somebody gets attacked, even seriously. It's not that I assess blame and find the animal innocent. Even if I find the animal guilty I have no desire to destroy. And I don't think in the business we're in we should destroy. Parks are for people, sure, but on nature's terms, not peoples'. The parks were set aside as wildlife sanctuaries — natural homes for natural creatures and their needs and habits and temperaments should be of primary concern. Where human ingress can occur without detriment to the wildlife, fine. Almost any naturalist who loves the wild wants others to see and love it too — as long as they respect.

Maybe danger belongs in a national park. I think it's being there is a part of what we mean by a "wilderness experience", a "national park experience." National parks are not cozy roadside tourist attractions, designed to satisfy the curiosity of mankind in padded comfort. They are slices of the natural world and thus they should be. In the natural world there is "danger". In the natural world there is discomfort. In the natural world one occasionally gets hurt. That's not to say it has to be all discomfort and hurt.

I think one of our biggest problems for the future is telling people before they come to a park what it's like. Telling them so they can go to a zoo for safe captive animals, to a private reptile garden or a marine exhibit to see porpoises fed and gators wrestled, to the public beach for swimming

A Cougar at Everglades National Park



NPS Photo

Exhibit illustrating the power of the American Black Bear



and water skiing, to a manicured city park to play ball and take sunbaths, to a trailer park to spend the winter cheaply in the sun. People should know what a national park is — and isn't, before they commit themselves to spend their vacation or their weekend there. They should know if it's going to be rough and primitive and if they want the rough and primitive and natural, fine. I think we have an obligation to inform people — honestly. But I think we betray the ideal behind the whole National Park System if we try to plane down all the rough spots, shoot all the touchy animals, fence off all the cliffs and offer visitors "a national park scene in the safe comfort of your own living room." With Thoreau I'd like to know an entire heaven and an entire earth, and I think basically our natural national parks should offer an entire heaven and an entire earth.

NPS Photo



PARK STANDARDS

OPEN SPACE and Quality

by WILLIAM L. LANDAHL •

The struggle for parks in the United States has been a long and hard one. A poet was responsible for our first park. (1) He complained that his walks in the country were being restricted by growth of New York City — people listened — and Central Park came into being in 1851.

In 1870, Frederick Law Olmstead, landscape planner, established general park standards which respected the natural topography of the city and utilized the natural features to their fullest. Generous tree plantings were provided, foot paths and traffic paths were separated. Formal or informal parkways were to lead to the parks (2) — yet today there is not a metropolitan area that has caught up with his planning.

The needs and role of the metropolitan area are basically the same today as 100 years ago! The urgency today is like a cancerous growth, our open land is being consumed at the rate of a million acres a year, the surrounding green and productive countryside, so common to our area, is disappearing.

At present there is no shortage of scenic park and recreational space in America. However, the supply is located primarily where people are not, far from the urban population centers where the greatest demand exists for outdoor recreation. Two out of three people who live in or near our largest cities are not within convenient driving distance of the country's major parks and forests. Only fifteen percent of America's population lives in the West where seventy-two percent of the exploitable public recreation acreage is located. (3)

According to the Outdoor Recreation Resources Review Commission report of 1962, driving for pleasure was the nation's most important recreational activity. This has since been updated by the Bureau of Outdoor Recreation's study in 1965 (4). Outdoor Recreation Trends rated for the year 1980 in popularity will be:

1. Swimming
2. Playing Outdoor Games
3. Walking
4. Driving for Pleasure

• William L. Landahl is well qualified to discuss these matters. He has been Director of Parks for Jackson County, Missouri, for the past eight years, moving to the Kansas City area in 1959 from his former post of Assistant Superintendent of El Paso, Texas, city parks. He started his park management experience as a seasonal ranger with the U.S. National Park Service, and served as a Park Superintendent for the Kentucky State Park System in the early '50s.

Mr. Landahl earned the B.S. in Forestry and Park Management at Michigan State University in 1950, and is presently doing graduate work at the University of Missouri. He is a fellow of the National Recreation and Park Association, and is a member of many other professional park associations including the American Society of Civil Engineers, Texas Recreation Society, the Missouri Park and Recreation Association, Missouri Planning Association and the National Trust for Historic Preservation. He served as Vice-president of the Southwest Park and Recreation Training Institute in 1967.

The recipient of several awards for achievements in his field from various national organizations, Mr. Landahl has published numerous technical papers in such journals as "American City," "Parks and Recreation" and "History News."

The 1966 Missouri Comprehensive Outdoor Recreation Plan (5) rates the most popular recreation activities as follows:

ADULT MALES

1. Driving for pleasure
2. Walking for pleasure
3. Fishing

ADULT FEMALES

1. Walking for pleasure
2. Driving for pleasure
3. Swimming

CHILDREN OVER 6

1. Playing games
2. Bicycle riding
3. Swimming

In 1965 a "Visitor Use Survey" (6) was conducted at a large metropolitan county park and the reasons people gave for visiting the area were:

Sightseers	41%
Fishermen	26%
Picnickers	22%
Boaters	7%

For study purposes and further research, the above are impressive and stress the regional differences, but our problem is in the developed metropolitan areas. As indicated by the following, the people are in the cities.

In 1960 and 1965 the following attendance figures were reported:

	1960	1965 (7)
National Parks	72 million	133 million
National Forests	93 million	160 million
Corps of Army Engineers	109 million	128 million
State Parks	263 million	421 million
County and City Parks	Billions	---

For our day-to-day living the people want a pleasant environment, trees, grass, clean streams and air fit to breathe. Laurance S. Rockefeller, in his foreword to the book "Cluster Development" states, "the crux of the outdoor recreation problem is in our urban area. Here is where the land is hardest to come by, and here is where the bulk of our population lives, and the concentration promises to become greater in the future. Far away parks make a great contribution, but the basic need for outdoor recreation in the metropolitan areas cannot be met somewhere else." (8)

Not too long ago the outdoors existed in the vacant lot next door or four to six blocks away. Today it lies beyond many miles of freeways, landscaped with billboards and

junked automobiles. A recent study by the University of Michigan Survey Research Center found that forty-five percent of the people questioned preferred "a house in the country, with woods or a field between you and the next house." To be more appealing the outdoors need to be brought back into the metropolitan area.

Standards of how many acres of park land necessary, per thousand population, have been offered by many professionally trained administrators and numerous studies have been undertaken.

"As far back as 1914, Charles Downing Lay, at that time landscape architect for the New York State Department of Parks, estimated the park needs of a city should provide an allowance of one acre of park space to 66-2/3 people." (9)

For many years the commonly accepted standard has been one acre per 100 population. This figure was promoted by the National Recreation Association as a desirable standard. In its 1965 publication Outdoor Recreational Space Standards (10) the NRA (now the National Recreation and Park Association) recommends 25 acres/1000 ultimate population to be provided by local governments and 65 acres/1000 ultimate population to be provided by the state government.

It has been suggested in a report, Proposed Standards for Recreational Facilities, prepared by the Detroit Metropolitan Area Planning Commission (September, 1959) that one acre per 200 population is a reasonable standard in cities with populations over 500,000, and perhaps one acre per 300 population for cities over a million inhabitants.

In 1957 the California Legislature directed the development of the California Public Outdoor Recreation Plan. This plan, developed in two parts and published in 1960, recommended seventeen acres per 1,000 population for urban areas; allowing five acres for neighborhood facilities, one acre for community facilities, and eleven acres for district facilities per 1,000 persons. (11)

In the words of Harry S. Truman (1932) "every county—and particularly those counties around large centers of population—is obligated to provide the best it can for the recreation and health of its citizens, this plan (1932 Stayton-Veatch Report) will put recreational parks and lakes within a few minutes by motor car of every resident of the County (Jackson County, Missouri)."



Jackson County Park Ranger Naturalist with Young Visitors

Interpretative displays tell history of area.

Hopewellian burial site, a diorama used in connection with archaeological excavation.



Kansas City Suburban Newspapers, Inc. Photo

In 1962 the Jackson County Park Department, Missouri, prepared a master plan for a major park system, requiring twenty-two acres per thousand population. This provided four acres for the city-wide and neighborhood parks, plus eighteen acres for the regional county parks. These were proposed as minimum standards, as both Kansas City and Independence are proposing ten acres as their minimum.

In 1963 the St. Louis County Park and Recreation Department had a plan prepared by the National Recreation Association which recommended twenty-five acres per thousand population. This was based on "the national recognized and generally accepted standard for recreation area is ten acres per 1,000 of the population within the limits of a municipality... Based on current experience, there should be at least fifteen acres of regional recreation area per 1,000 of the metropolitan population located beyond the urban area." (12)

In 1963 the Texas State Park Department released a plan (13) where the National Park Service recommended sixty-five acres per 1,000 population as a reasonable goal for all outdoor recreation areas; all classes of state parks, recreational values of state forests, game refuges, etc. Twenty acres were recommended for recreation parks and forty-five acres in native areas.

The White House Regional Conference on Outdoor Recreation suggested forty-five acres per 1,000 population by the year 2000.

The recent study (1964) of "Recreation and Open Space in Illinois" proposes 120 acres per 1,000 population. (14) This includes:

Neighborhood Parks	7 acres
City-Wide Parks	13 acres
Regional Parks	40 acres
Regional Reservations (County or State)	60 acres
TOTAL	120 acres

Dr. Marion Clawson in the Resources for the Future study estimates the public regional recreation space will require 175 acres per thousand by the year 2000.

Of the numerous studies carried out, all admit that present park systems are inadequate, they have not kept pace with increasing demands and acreages are not adequately distributed to serve urban needs, or the systems lack balance to provide varied types of recreation activities. (15)

In "The Crisis in Open Land" the American Institute of Park Executives says, "Today the standard of one acre of park space to 100 people is outmoded. To meet today's crisis, metropolitan communities must base their acquisition of open land not on today's population, but on the estimated population of their areas forty or fifty years hence."

The use of standards must be approached with caution. An acre in the eastern hard woods area will support more park visitors and suffer less wear-and-tear than an acre in the semiarid western states. Park and open space needs are determined most effectively through a detailed study of the resources of a locality and the population served. As Edward C. Crafts stated in the recently published Outdoor Recreation Space Standards (16), "standards developed in response to a specific set of resource, land-use, and cultural conditions in one area may not be relevant to another area with a different set of circumstances."

Ann Louise Strong uses stronger words (17) when she states "The development of quantitative standards to guide the preservation of open space land for conservation and for shaping urban development does not appear to be feasible or desirable. The amount of land to be designated for these purposes is dependent on the region's natural features and on regional comprehensive planning objectives. Each of these factors is unique to a particular region. General goals, rather than standards, are more useful for determining requirement for conservation lands."

Judged even on out-dated standards, it is doubtful whether ten percent of our metropolitan areas have acquired enough open land. Almost none has a program massive or aggressive enough (18) to meet the requirements of the next ten or twenty years.

In President Kennedy's housing message to Congress, March 9, 1961, the need for open lands was expressed as follows: "Open space must be reserved to provide parks and recreation, conserve water and other natural resources, prevent building in undesirable locations, prevent erosion and floods, and avoid the wasteful extension of public services. Open land is also needed to provide resources for future residential development, to protect against undue speculation, and to make it possible for state and regional bodies to control the rate and character of community development."

Charles Eliot, one of America's great landscape architects, considered open spaces to "range in size from

the vast reserves of natural land, to the urban park, to the urban plaza and down to the street. Indeed, it is the sidewalk that is the elementary open space of a city. In use, open spaces range from completely passive, almost unused spaces, to highly active urban spaces—the city's outdoor salons and playgrounds.” (19)

Open spaces are not isolated islands of space but a net of interlocking systems which creates an illusion of greater space. Even highways can be made beautiful by offering glimpses of lakes, woods, streams, overlooks of cities—all of this give an impression of space and beauty. Through proper use of the land an illusion of large parks can be created as open space relieves the harshness of the urban form, is informal, natural and park-like.

Park-like, even this word contains different meanings, as expressed in a recent article in the *Saturday Evening Post*, “_____ Park is newer and nicer than most Department of Parks playgrounds. It is neither dwarfed by a neo-Georgian comfort station nor landscaped with black-and-white signs that begin with the word ‘NO’. It is devoid of slides, of swings, of anything more organized than a sandbox. What it has are wide-open spaces—enough for a tricycle rider to play bus driver; enough for a good game of running bases; enough for a city boy's imagination to roam.” (20)

“There should be more experimentation with uses of open spaces—in particular, the relationship between private and common spaces. There is a lot of dogma about how people should use open spaces, but remarkably little attention paid as to how people actually do use them. Formal play areas are an example—children seem to play almost anywhere else.” (21)

Professor Francois Bourliere (22) for the year 1984 predicted “The industrial agglomerations of 1984 will thus have to include numerous parks and, above all, there will be ‘social forests’ surrounding them with relaxation and rest

Kansas City Suburban Newspapers, Inc. Photo

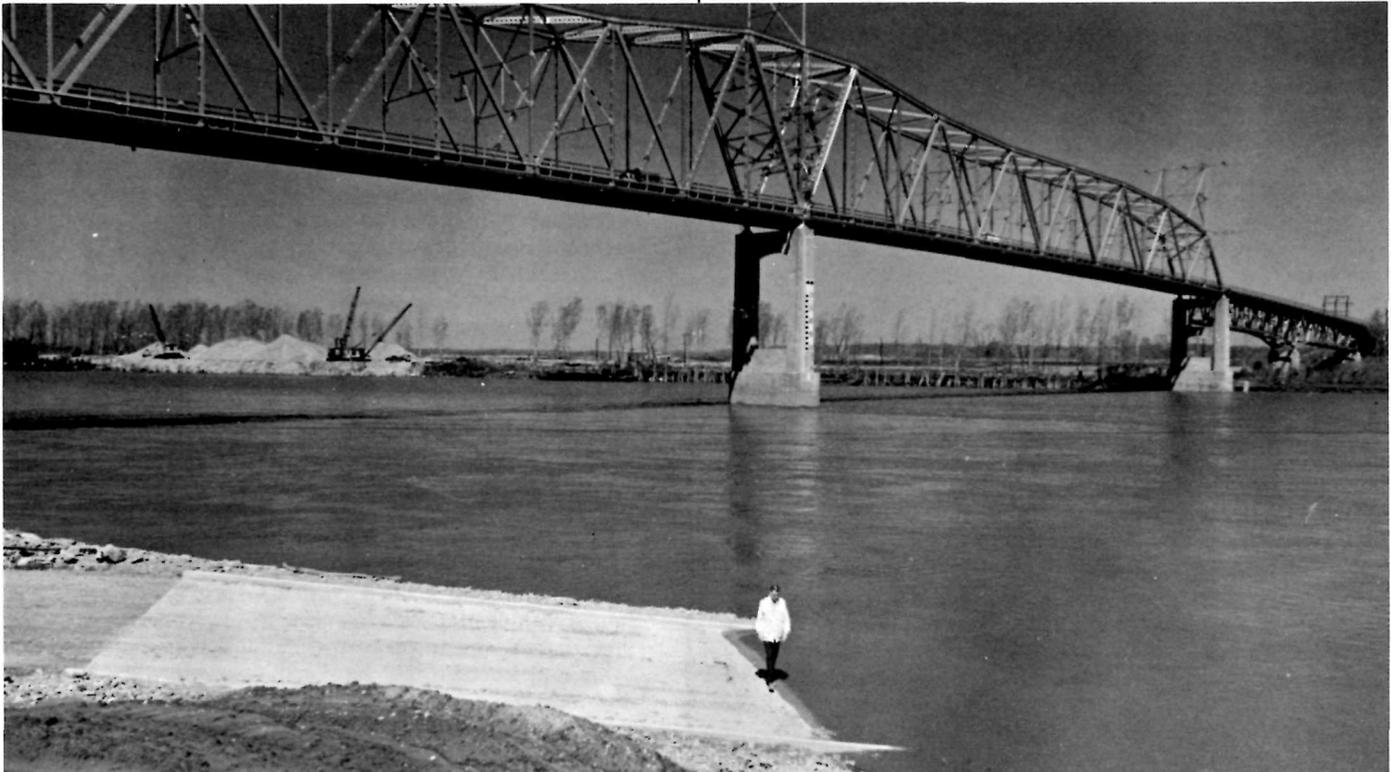


Pyramid-shaped shelter house, Lake Jacomo Campground

areas—natural oasis where a number of wild plants and animals will be able to exist in the vicinity of towns. In such a way man-himself the most precious natural resource to conserve in urban areas—will be able to coexist peacefully with some remnants of undomesticated nature, for the benefit of both.”

Professor Bourliere further states that all rich soils will be used to their fullest and little space will be left for untamed nature, only a few natural reserves will be kept for scientific or aesthetic reasons. Recreation seekers will fly to other parts of the world to hunt, fish or just to enjoy peace and quiet.

Kansas City Suburban Newspapers, Inc. Photo



New park and launching ramp on the Missouri River, Jackson County

With this voice of doom ringing in our ears it is refreshing to read The City is the Frontier, by Charles Abrams. (23) Mr. Abrams advocates "The logical way in which the nations environment might be preserved for those who live after us is for the states or federal government to acquire the land needed for the extension of existing cities and for new cities."— There are many incidental public purposes that are fulfilled in such a program — preservation of open space, greenbelts, and scenic lands, proper planning, aesthetics, prevention of urban sprawl and traffic headaches; low-income housing, relocation needs, and recreational and public facilities. It is (by this method) even possible to create national parks and living areas side by side.

An example offered to prove the wiseness of such planning is— since 1947 developments have sprawled over 200 square miles in Santa Clara County, California — if this land had been planned as a single subdivision it would only occupy twenty-six square miles.

The point is further stressed that better planned communities can be built on land acquired by public authorities, with schools, services and utilities provided in advance. With a small park as the focus of every neighborhood and in built-up areas "finger playgrounds" can be converted from one or two lots into creative play areas.

To further point up the importance of open space the State of California completed a study on an open space program in November, 1965. (24) The study for the survey was a forty-mile radius around all urban centers in California. These open spaces, including all unroofed areas, added up to a system which is the basic structure of communities linking them to the wild or pastoral hinterland. It was recognized that open space is important in determining the quality of the environment.

"The counties and cities in California, which are usually thought of as garden spots, have a fantastically low park and recreation resource. The county park systems in California now have between a two and six acre ratio per thousand population, whereas, they should be at least fifteen acres per thousand population. The city park systems have an existing ratio of less than five acres per thousand population, whereas, there should also be about fifteen acres per thousand population. As you can see, the question is not only a question of trying to make up for inadequacies of the recreation systems of these local governing bodies. Depending on how you define recreation, the open space idea is much broader than recreation, even though it is an important part of it. Normally, where we have said that there should be thirty acres of park per thousand population, there are no standards for how much open space there should be because it depends upon the situation."

The survey proposes the creation of a new statewide open space agency and that priorities be established in terms of the danger of urban encroachment.

In the Los Angeles basin of 1200-1500 square miles it is no longer possible to find much existing open space — it is proposed that open space be created by redevelopment — at a staggering cost. A new level of design will be necessary to create open space in 500 acre parcels, totaling between 100,000 and 200,000 acres.

In northern California (Monterey, Sacramento and the Bay area) it was 700 acres per thousand population.

Mr. Eckbo further states "the pursuit of this open space could become a system of planning and design which in turn would become responsible for the total quality of the landscape in which we live. It is not a fragment of the landscape. It can be a major disciplining effort which can be the vehicle whereby we can, in a sense, save ourselves."

In a recent issue of Progressive Architecture (25) Percival Goodman states, "In comparison with today's scientific achievements, a planner's knowledge is based on old wives tales, his techniques are neolithic, his organization for improving and advancing his art fragmented, the criteria on which the planning process operates limited, and the vision myopic. Until we decide that it is unnecessary to spend our best brains and resources on over-kill, that the earth is more important than the moon, that people are more important than things, if, in a word, our national goals shift from war to peace, then, perhaps, planning for the total man-made environment will be possible and we can start on this remarkable project."

Camillo Sitte, an Austrian architect, published his classic book (Der Stadteban) on a city planning in 1889. This book is as up to date as our present books. Mr. Sitte advocates all of the amenities of urban living; paths for people, benches for resting, fountains, planting of trees and shrubbery, occasional irregularities in building-frontage lines, etc. (26)

Jane Jacobs, in her book The Death and Life of Great American Cities, (27) is highly critical of parks and planners and stresses that parks are for people as indicated by her statement "if a generalized city park cannot be supported by uses arising from natural, nearly intense diversity, it must convert from a generalized park to a specialized park. Effective diversity of use, drawing deliberately a sequence of diversified users, must be deliberately introduced into the park itself. ... The more successfully a city mingles

Kansas City Suburban Newspapers, Inc. Photo



Youth Involvement— Boy Scouts prepare a nature trail at Lake Jacomo

everyday diversity of uses and users in its everyday streets, the more successfully, casually (and economically) its people thereby enliven and support well-located parks that can thus give back grace and delight to their neighborhoods instead of vacuity."

"With art, then, we can link the parts of our urban landscape into a very effective whole. In gross acreage, such networks (open space) may be smaller than the large greenbelt; in effectiveness they can be far greater. They can be woven throughout the urban area, where people will see them and use them, as part of their daily life—not relief from the environment; but within it." (28)

As stated in *The Crisis in Open Land*, "When in doubt, get the land now and rationalize the purchase later."

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(SANDY HOOK *continued from page 2*)

Guided Nature Walks

Our park in those earlier days, had no facility for nature activities. Walks for visiting groups, which ranged from individuals to organizational field programs, started on the first beach parking area. An introduction to the Sandy Hook area, including geologic history, was presented to the groups by lecture, supplemented by flash cards. Animal study skins, and various objects of natural interest were used to orient the nature walk participants.

The most popular of the three walks offered was the Holly Forest Walk. This walk lasts about 1 1/2 hours and covers 1.2 miles of winding trail. The path meanders through the 76 acre holly forest, crosses marshland, and finally passes along the cove area on the westward side of the "Hook."

The Nature Center

The trickle of people became a torrent after that first year of operation. Because of the increased demand for services, it was necessary to add two teacher-naturalists on a part-time basis. In 1964 a rustic Coast Guard building, complete with tower and "widow's walk," was designated as the Spermaceti Cove Nature Center. The former upstairs dorm area, with plywood lab tables built under the eaves, became our first lab-classroom. Bedroom dressers became filing cabinets, equipment storage areas, and aquarium supports. Glass cabinets, donated by various businesses, became display areas for local shells, beach oddities, and animals and plants of the area. A care center was established with donations of surveyed equipment from a surgical firm. Animals that did not respond to our treatment promptly joined the growing number of specimens in our study skin collection. A research library was started by collecting discarded school science texts, sample texts from various publishers, nature periodicals, and materials from museums, parks, and various commercial sources.



The Spermaceti Cove Nature Center

Self Guided Nature Walks

The public demand for weekday services at times other than the summer months created a problem. Garden clubs, school groups, and nature organizations requested nature services at times that guides were not available. This problem was eased by the development of two self-guided trails that are open throughout the week. One of these trails, a nature trail covering 1/2 mile of dune and forest, was established. A second trail, the geologic walk, uses the varied rocks of the sea wall as an open display. Although rocks are scarce in this Sandy Hook area (as on most of the coastal plain), a good representation of rock types of northern New Jersey were transported here for storm wall construction. The State Park provides free booklets to accompany the self-guided trails. These booklets are coordinated with numbered posts and rocks along the paths. Self testing is built into each booklet. For example—The prickly pear cactus is identified at post #7. A question asked later in the walk is—Can you identify this plant? If not, refer back to #7. The geologic walk in itself is static in nature, but a multi-seasonal approach is used in the nature walk booklet to cover the changes of plants and animals throughout the year.

Lecture Programs

During the winter of 1962-63, using about 60 35mm slides donated by visiting photographers, the State Park initiated a lecture program. This service, supplemented with my personal purchases of an inexpensive projector, screen, and 35mm single lens reflex camera, grew in demand. Our library of color slides has multiplied to some 4,000 pictures of natural and historic features of the area. Many outstanding photos were contributed by Warren Egge, Robert Darling, William Shaw, and other nature photographers familiar with the shore. The lectures are now presented in a series that ranges from the beginning generalized lecture called "Sandy Hook Urban Wilderness" to such specifics as "Barrier Beach Birds," "Conservation of the Barrier Beach," "Edible and Poisonous Plants of the Shore,"



Observing the plants and animals of the salt marsh.

"Resources of the Sea," "Our Blemished Heritage," "Barrier Beach Geology," "Animal Care," "Outdoor Education at Sandy Hook," and numerous others, "customized" to suit the interests of the audience. All programs are presented without charge to the group at their organizational meetings (or the Nature Center). A minimum attendance of twenty-five people is expected at each program, but groups have ranged as high as several thousand in number. "The Friends of Sandy Hook," a group of conservation minded citizens dedicated to the conservative development of Sandy Hook, have supported our program with their donation of an additional projector and screen, folding chairs, and a tape recorder. The hundreds of lectures presented to scouts, garden clubs, and service groups, have promoted the attendance of these individuals and groups to actual participation of park programs.

Conservation Programs

Shoreline erosion is a persistent problem along the Barrier Beach. Dune conservation has at least been a partial solution to this problem. After each Christmas holiday, mountains of trees, many still covered with decorative tinsel, are delivered to the State Park. Brewery vans, scouts with borrowed vehicles, and state trucks pick up discarded trees throughout the surrounding communities. Y.M.C.A. groups, scout troops, and conservation-minded elementary students, dig these trees into the shoreline sands to slow the winds and produce dune growth. "The Christmas Tree Project" has resulted in several mile-long parallel dune lines, some of which are 12 feet high. The newly established dunes are anchored more permanently by dune grass planting. These grasses are supplied to conservation groups by the State Department of Conservation. A conservation award is presented to each group after the completion of their project.

Summer School Programs

It had been our desire at the State Park to offer a more comprehensive study of the natural areas during the peak months of marine reproductive cycles. Mr. J. Ronald Gardella, teacher-naturalist, and I, began planning a student summer course in the marine sciences. By coordinating the facilities of the State Park through Superintendent Riker and Dr. William A. Gillcrist, Jr., Middletown Township Assistant Superintendent and Summer School Supervisor, we initiated the program in July of 1965. Twenty-seven students from throughout New Jersey attended this first four week program. Although our studies were marine oriented, the first two weeks of the program were spent with a study of geologic development of the barrier beach, barrier beach conservation, and the terrestrial flora and fauna of the beach, and forest.

Two successive summer programs were expanded into three summer offerings: (1) The Junior Marine Research Program, a field oriented program for Junior High students; (2) An Interpretive Study of the Barrier Beach, our original program for high school and college aged students; and (3) An Advanced Research Program for those who desire more specific natural survey of greater depth. The first program is given in Mid-August and is two weeks in extent. The last two programs listed are four week offerings in July. Some of the outstanding events in these Summer Programs are: a visit to the Sandy Hook Federal Marine Research Lab; The Rutgers University Clam Purification Lab. for water pollution study; and a day of oceanic re-

search and fishing on a vessel in the Atlantic Ocean. The students also attended a marine comparative collecting survey at the Manasquan River Inlet, and studied the relationship between modern organisms and ancient ones by investigating the Cretaceous fossil beds of the mainland.

The 1967 summer program was enhanced by a visit from the Biology Club of College Bourget, Rigaud, Quebec, Canada. Six students and three instructors, led by Father Louis Genest, spent two weeks with the July summer program. The possibility of an annual exchange of students for marine study is now under investigation.

Adult Education Programs

In the Spring of 1966 an evening program for adults was offered at the Nature Center. This program was a joint venture between the State and Middletown Township's Evening Adult Program. The classes of this ten week course met each Monday between the hours of eight and ten p.m. The interest and ages of the participants were quite varied, but all seemed to enjoy the flashlight nature walks and beach collecting hikes. A Saturday field trip was held for daytime specimen collecting. This was planned as a family affair and the large attendance produced some unusual specimens for preservation. One outside field trip was held at the Monmouth Beach Clam Lab. where a program on water pollution and its effect on molluscs was explained.

In the programs following that original adult school venture, we have been over-subscribed. Our original plan for a maximum capacity of 30 people was stretched to accommodate 34. We are now expanding our offering to two separate evening programs each week. One program will permit time, equipment, and technical assistance to be offered to small groups for research in more specific areas.

The School Interpretive Program

In November of 1965, a conference was held in Trenton with Mr. Robert W. Ward, Assistant Director of Curriculum and Instruction for the New Jersey Department of Education. The intent of this conference was to establish a teacher's in-service training program at Sandy Hook State Park. Mr. Ward suggested a broader approach by encouraging the development of a teacher-child oriented program. This program could then be founded under the then new Elementary and Secondary Education Act of 1965 (E.S.E.A.). This Act, under Title III of Public Law 89-10, provides federal funds for the planning and operation of innovative educational programs. These programs are intended to supplement, not supplant, current school programs. The goal of the Title III aid is to produce during the three year funding period, exemplary programs, so valued by local and other school systems, that the financial burden of continuation will be willingly assumed by these groups when federal financing ceases.

By having both students and teachers attend the Sandy Hook Supplementary Educational Program, the goals of in-service training would be fulfilled, and students would gain valuable experience in the outdoors. To many the obstacles in establishing a program, using state facilities, federal funds, and a program administered and staffed by a local Board of Education might seem insurmountable. At Sandy Hook these problems were eased by the existing active cooperation between the State Park System and local educators. A joint program had already been established through the use of local teachers as part-time park naturalists and instructors in summer school programs. The increasing need for public



Mr. Gardella explains the relationship of food producers and consumers.



This Elementary Geology Program is called "A Handful of Sand"

conservation education also provided a common meeting ground for state officials and educators alike.

Middletown Township was selected as the pilot area for other important reasons Sandy Hook is a part of the Middletown School System. This system's large geographic area, nearly 39 square miles, has a student enrollment of over 12,000 children. These students provide a good experimental profile of varied communities. Inland suburban settlements and bayshore towns are served equally in our program. Within this community profile we find children with affluent backgrounds being schooled with children from economically and culturally deprived homes. One child in our program kept pointing to his father's yacht anchored just off-shore. Another student had never seen the ocean, though he lived only six miles from the shoreline. Now that we are progres-

sing beyond the pilot phase, our programs are being offered to schools beyond the Middletown area.

The difficulties in writing a program for federal approval were eased by the wealth of survey materials developed during previous park programs, and the able assistance of J. Ronald Gardella, program co-author and teacher-naturalist at the park. The program, coordinated by both state and local administrators, was submitted to the Department of Health, Education and Welfare (H. E. W.) for approval.

On January 28, 1966, the H. E. W. office informed the Middletown Township Board of Education that funds were approved for the Sandy Hook Interpretive Project (Project OE No. 66-532). A sum of \$37,000 was granted for a five month pilot operational period ending June 20, 1966. Although general approval is granted for the three-year period of program operation, financial approval is given only for each current fiscal year. Total funding for the three-year period will be \$180,000.

The federal grant has changed the "make do" atmosphere of the Nature Center into one of more scientific approach. Rows of formica tables and chairs, cabinets lined with microscopes and binoculars, office equipment, salt-water aquariums on display, library shelves stocked with research materials, and a mobile science van for outside area programs, all ease the task of instruction.

The Sandy Hook Program, unlike many other Title III programs, is not a resident type education. The participating classes are bussed directly from their classrooms to the Park's Spermaceti Cove Nature Center. After each day's program the children are returned to their classrooms on the mainland. The average period of program attendance for each 4th and 5th grade township class, has been 1 1/2 hours per day for one week each year. School districts beyond the local area are offered a choice of programs. These programs are flexible to meet the needs of the applicants, and range from a one day offering of the condensed grade level programs (which are normally a week in extent), to guided walks in the natural areas.

Program Objective

The objectives of the Sandy Hook Interpretive Program are the following:

1. An understanding of natural phenomena, concepts, and principles that are part of the child; environment.
2. An understanding and appreciation of our natural resources and the need for their conservation.
3. An understanding in the use of manipulative, experimental and problem-solving skills which are utilized in science.
4. An understanding of the vocational and avocational aspects of science.
5. The development of habits and attitudes such as open-mindedness, intellectual and scientific integrity, and the respect for human dignity.

Phases of Program Development

Before explaining each program in detail, an overview of program expansion will prove helpful.

Phase I - (March '66 - June '66) The beginning of the Pilot 4th Grade Geology Program. Program Theme - "A Handful of Sand." Nine Public and three Parochial classes were selected from twelve of the fifteen Middletown Elementary Schools.

Phase II - (September '66 - June '67) All 4th grade classes in Middletown Township (40 classes) attended the Sandy Hook program. Fifteen 5th grade classes, selected from a representative school, attended the pilot Biology Program. Program Theme - "The World of the Bird Feeder." Several one day programs were tried with outside area schools. These schools were offered, in one day, the highlights of the normal week-long elementary programs. Reports from the experimental schools indicate a great interest in future programs involvement.

Phase III - (September '67 - June '68) All 4th and 5th grades in the Middletown area (80 classes) attended a week of program activities at Sandy Hook. Fifteen pilot 6th grades, one from each school, attend a Marine Biology Program. Program Theme - "Our World in a Fishbowl." One day programs in the arts, science, and social sciences will be offered to any non-profit educational group, kindergarten through college, that apply. Approximately 150 field and laboratory days will be provided for these visiting classes.

The Elementary Geology Program

Teaching basic geology to 4th graders becomes difficult if over-technical methods are used. The theme of the program, "A Handful of Sand," is the keynote to our basic approach in teaching barrier beach geology. The goal of students, during the week of activities, is to trace beach sand to its rock origin, examine the forces that release and transport this material, and study the need for conservation in these shore areas.

Before the class attends the program at Sandy Hook, their teacher is invited to the nature center for a program confer-

ence. During this visit the program is explained, and a teacher's guide, containing student program activities and answer keys, is provided.

On the first day of class attendance the students are bussed from their mainland classrooms to the Park's Nature Center. After the program introduction, the students are issued binoculars, and are guided through the wildlife areas. Although geology is emphasized during this walk, the naturalist-guides point out the biologic features of the marsh, shorelines, and holly forest. Students examine the huge stick nests of the fish hawks, and ponder the probable origin of the skull and crossbone design carved on one of the ancient holly trees.

Throughout the remainder of the week the classes complete the following assignments:

THE BIRTH OF A ROCK

This day of laboratory experience introduces the students to the crystal concept of rock structure. Rocks are related to cakes. It is explained that rocks are classified by their difference in mineral content. Cake names vary with the ingredients used. A stereomicroscopic examination of salt and sugar crystals is completed by each student. Crystals are grown from supersaturated salt solution, and the day's activities end with a microscopic search for crystals in fragmented rock.

THE BIRTH OF OCEAN AND BEACH

This lab. study takes the students on an imaginary trip to the beginning of time to witness the birth of continents and oceans. "Discovery Sheets," which are illustrated problem-guides, encourage student understanding of the water cycle, and some of the effects of weathering and erosion. Miniature mountains, of sand,



Fifth Graders participating in a Biology program.

Mobile Science van is used for library and equipment loan services.

gravel, and water, hardened in freezers, now undergo rapid changes in a spray of simulated rainfall. In a few minutes the micro-formation of river valley, delta, continental shelf, and beach area can be observed. By siphoning some water from the demonstration tray the student can observe how a continental shelf becomes a coastal plain. This microplain area is compared to a relief map to indicate the watery origin of southern New Jersey. A stream of water, directed along this demonstration coastline, produces a barrier beach "Hook" formation in minutes.

BEACH AND DUNE CONSERVATION

Students study the erosional nature of wind driven sand by using a "Dune Machine." These machines are vacuum cleaners, with hose reversed, that blow a stream of sand through a baffle of shells, grass, and stones arranged on an observation table. Miniature dune deposits can be observed as they form around the obstacles. The class then participates in a dune conservation program by placing dead Christmas trees in rows along the dune areas. The day's program is completed with a collecting hike along the shore. Some of the student's collecting bags are filled with seashells and beach oddities before bus departure time.

A SELF GUIDED PROGRAM REVIEW

A junior edition of the self-guided nature walk is provided each student. Small reading groups review the natural aspects of the shore, dune, and holly thickets by following the numbered posts along the half mile trail.

The week of study ends with a hike along the rock groin and sea wall areas. Here the students see man's monumental attempts at controlling nature. This day completes the program at the nature center. The class, before departure, is presented with an award for their participation in a conservation project.

In the Fourth Grade study of geology, a day to day continuity is important the examination of salt and sugar crystals shows variation in crystal shapes while the development of crystals from solution shows its fluid origin. The discovery that rock fragments are made of crystals leads to the student assumption that rocks developed from a fluid. The following days study of weathering and erosion shows the students how minerals are released from their rocky prisons and transported to new areas. The miniature mountain demonstration depicts topographical formations such as valleys, rivers, deltas, a continental shelf, and the coastal plain. Beach sediments have now been traced from mountain to shoreline. The use of the dune machine shows the embryonic origin of dune formations and emphasizes the need for conservation in these areas. The conservation field day allows the student to participate directly in dune control. This "Christmas Tree Project" creates an area for observing dune growth through successive years of student attendance in programs at Sandy Hook State Park.

The Fifth Grade Biology Program

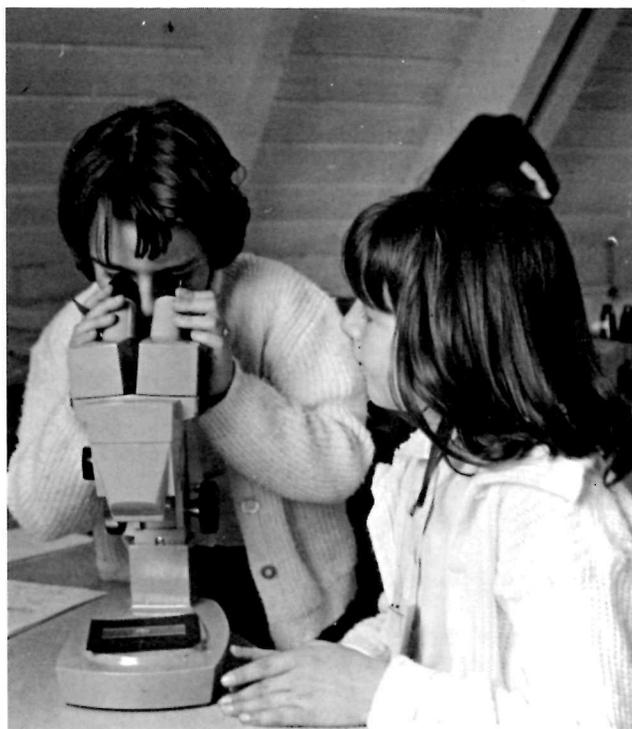
Many of the adults who participate in nature walks at the park have somehow, during youthful days, escaped the concepts of green plant importance. Probably those processes by which sun's energy is converted into needed food are somewhat taken for granted.

Our approach in teaching biology to elementary students hinges on the producer-consumer relationships existing in daily life. These relationships are found in the program's theme - "The World of the Bird Feeder."

During the teacher's pre-program conference period, a bird feeder and seed are provided for class use. The feeder is established on the local school grounds, preferable near the participating classroom. The students, prior to program attendance, study the activities around the feeder, and plant some of the seed for the study of plant growth. The producer-consumer relationships are then established before the students arrive at the park for the program.

On the day of arrival the students shout cheery greetings as the bus pulls into the unloading zone. The previous years program is still fresh in mind and the children look with interest toward another period of outdoor activity.

After a brief introduction the students are provided with "Discovery Sheets" to solidify producer-consumer relationships. The student connects with a line, common foods and the plant or animal they come from, to the energy sources in the sun. The students then take a self-guided walk along a special educational trail for a "Discovery of the Green World." Numbered trail posts and guide booklets lead the students along a meandering trail through thicket and sand areas. The Fall and Spring 5th grade schedule finds the trees in leaf and the many bird feeders along the trail busy with resident and transient visitors. A zoned area of sand is reserved for animal track study and students are asked to interpret the stories left in the sand.



Fourth graders using the stereomicroscope in their study.

Throughout the remainder of the week the classes complete the following activities:

THE ROOF OF THE GREEN WORLD

This day of laboratory experience is devoted to the cell and vein structure of the leaf, the process of photosynthesis (food production), and the types of foods that plants produce.

The cell is emphasized as the unit of structure in living things. The students remove some skin from an onion, stain the tissue with iodine, and do a microscopic study of cell arrangement. Simplified drawings of the cycles involved in photosynthesis are studied by the students.

To emphasize the color of the green world, chlorophyll is removed by placing the common salt-marsh plant *Salicornia* in a test tube bath of alcohol. The liquid turns a bright green. The veins of the plant are studied in the "plumbing of the green world." Large office ink pads are used to make non-messy leaf prints on study sheets.

The students trace the vein imprints from the food production centers to the leaf stem. A classical test for starch is to place iodine on the item to be tested. If starch is present the iodine changes from a brown to purplish-blue. The students test potato slices and find starch present in this common plant-produced food.

THE CONSUMERS OF THE GREEN WORLD

This is a combined lab.-field day for students. The varieties of food consumers are studied by using bird and mammal study skins, and insect collections. In the shore area, birds are the most noticeable animal for study. Teaching the children all the many different birds would be difficult in so limited a time, so a simplified method of instruction is used. "Let's Build a Bird" is a student project in which various silhouettes of necks, feet, and beaks are combined to produce a bird adapted to live in a specific area. A sample problem might be "Construct a marsh bird. This bird needs legs for wading, a neck for reaching fish, and a beak to spear them with." The resulting composite produces a heron-like body that is found in most marsh birds. Predator birds, insect-eating birds, and other types are constructed by the students. An overhead projector with bird silhouettes is used to review this student study.

The field portion of the day consists of a visit to the bird banding station in the Holly Forest. Mr. and Mrs. Richard Roche, Audubon banders from the Sherman Wildlife Sanctuary, net, identify, and band birds at Sandy Hook each week. Unusual birds are shown to the children and the banding procedure is explained.

BARRIER BEACH BIRD STUDY

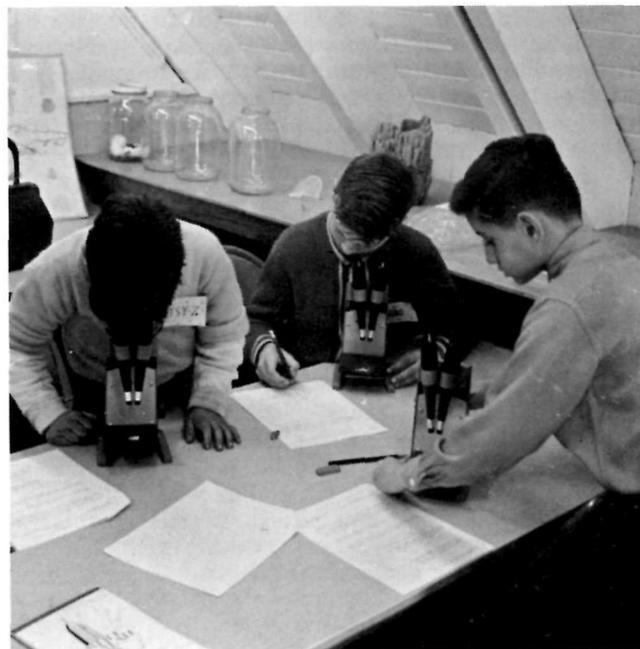
During this class field day, the students participate in a bird survey that covers the area from beach to forest. Binoculars, check lists, silhouette bird keys, and clip boards are issued to each student.

The continuity followed through the 5th grade program identified the green plants as producers, humans, animals and non-green plants as consumers, and establishes the important relationships between these living things and their surroundings.

The Sixth Grade Marine Biology Program

The pilot 6th grade program, "Our World in a Fishbowl," is now being developed. This fall, fifteen experimental classes will seine, collect, and identify organisms of the sea and shore areas.

The previously described programs have reached deeply into the community life of our area. Participating classes use their outdoor experiences, not only for science study, but also as a "spring-board" for mathematics, English, and other subjects. We have served entire families in our broad range of educational offerings. Adults and children alike have found a program adapted to their needs.



The fourth grade program "A Handful of Sand"

Because of the rapid expansion of our program, we have outgrown the present nature center. An application for a larger facility is now being processed. This building, some 15,000 sq. ft. in extent, is in the Fort Hancock Military Reservation on Sandy Hook. Two additional teacher-naturalists have been employed to help handle current program expansion. Our staff now consist of four instructors, a secretary, lab. technician, and one custodian. This staff is supplemented by four part-time naturalist-guides employed by the State.

Sandy Hook's programs are in operation throughout the year. We welcome observers to these programs. More specific information about each program may be obtained by addressing a request to: The Spermaceti Cove Nature Center, Sandy Hook State Park, Box # 57, Highlands, New Jersey 07732.

At Sandy Hook we have modified the old Chinese adage "One picture is worth 10,000 words" to also read "One experience is worth 10,000 pictures."