

NORTH CAROLINA ARCHITECT

OFFICIAL PUBLICATION OF THE NORTH CAROLINA CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS

SPECIAL NUMBER

CONSERVATION OF NATURAL RESOURCES IN NORTH CAROLINA



JUNE-JULY 1968

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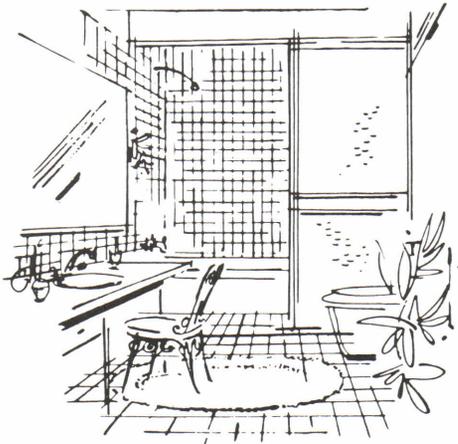
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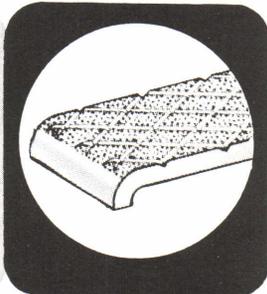
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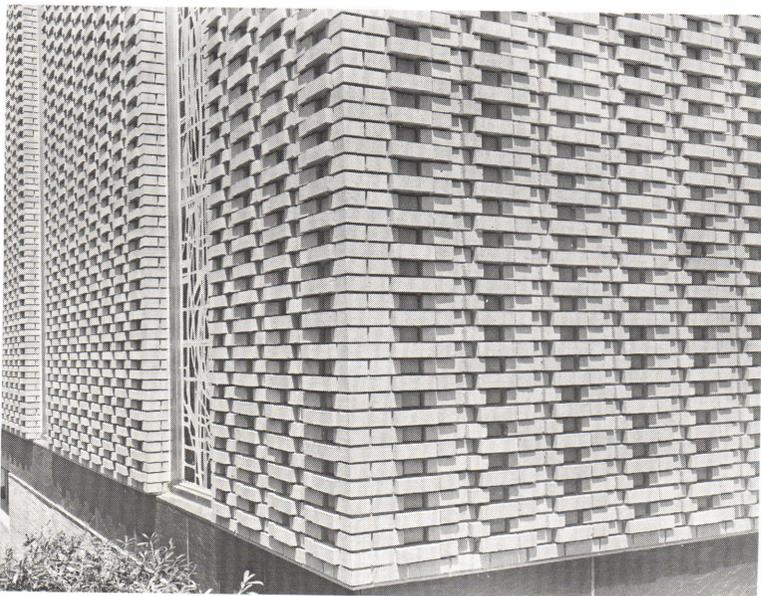
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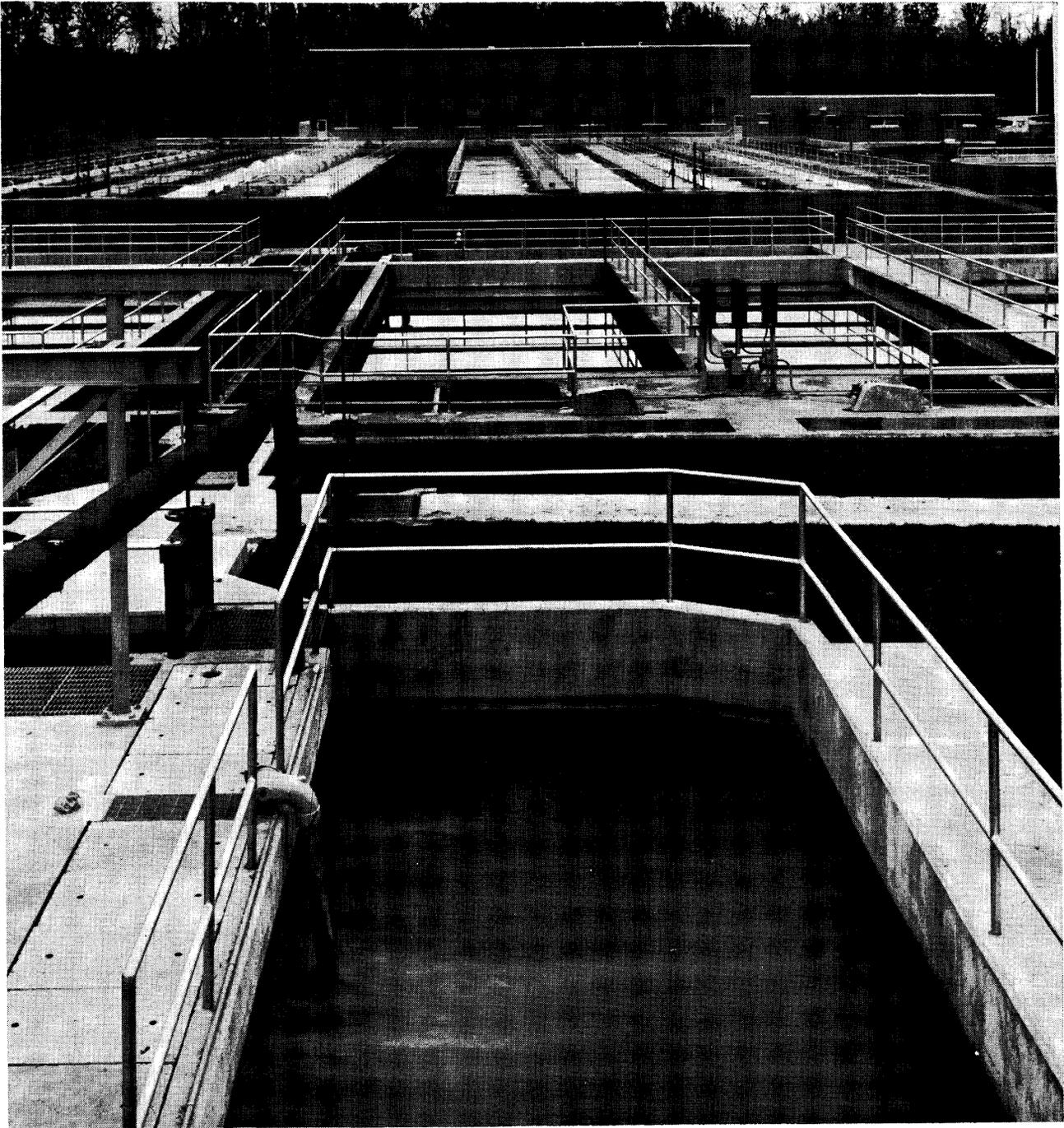
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LETTERS TO THE EDITOR:

Editor:

Our mission as architects is, or should be, to create, preserve, conserve and administer through the application of theory, imagination, technology and professional experience.

As we create, we must answer the rigid requirements of self-discipline. We must be sure that what we create is better than what we destroy—whether this be natural environment or an older building.

To preserve and conserve, however, we must not discourage progress through an exercise in nostalgia and emotion for an old building unless:

1. It has historical significance,
2. It has architectural significance,
3. Its preservation is economically practical, or
4. It is a vital part of a group of buildings worthy of preservation—for one or more of these reasons.

Time has long since passed when architects can concern themselves solely with the construction of buildings. The structure of our civilization is more important to our survival than the buildings we create.

John Erwin Ramsay, FAIA

Editor:

The Architect should and must be actively involved with conservation of our natural resources. His primary contribution, in my opinion, is conservation through proper planning and design. Design that is complimentary to the natural resources can and should conserve and, by example, encourage and educate.

We have succumbed to the dozer and blade for many years. "Cut and fill" is not the only solution to planning. Architects must lead the way in showing how proper conservation of our natural beauty can be an ally and true supporter of development.

J. Norman Pease, Jr., AIA

Editor:

The American architect cannot turn his back on the wanton destruction of our nation's natural resources, the fouling of the air, the contamination of our streams, and the thoughtless and deliberate bulldozing of the land. If our architecture is to serve all of mankind, the comprehensive designer must protect the natural resources in his planning for man's physical environment. Modern technology as manipulated by the contemporary designer will also need all of nature's accommodations to satisfy the total human spirit.

Henry L. Kamphoefner, FAIA

Editor:

Natural resources are integrants of composition as certainly as are specifically fabricated materials of construction.

Their individual unity is insipid reasoning for backing away from any alteration. Talent in developing a successful environment lies in their assessment, manipulation, and incorporation into the composite whole.

Ralph Reeves, AIA

Editor:

"Only that in cities air and light be clear and enough leaves remain to shadow a living land.

"Only that in each rise of land, each fall of water, each form of life, Man sense its character, its function in the whole, love it, and learn its ways, and when we turn it to our use, plan with inspired skills to fit to it our habitations and our needs to enhance—not to obliterate—its beauty."

These inspiring words were composed by Nancy Newhall, writing in "This is the American Earth." For me, they express our prime obligation as Architects; to plan for order, to create beauty in partnership with Nature, and with a sense of humility before our obligations to humanity and to the future.

Edgar H. Hunter, AIA

Editor:

Conservation and development of the resources of North Carolina go hand in hand. It is only through conservation of our physical assets that we can effectively develop them toward the end that North Carolina's growth will be directed toward the greatest good for the greatest number, and avoid the destructive elements of waste and blight.

A. G. Odell, Jr., FAIA

Editor:

Every Architect should take an oath to preserve the natural attributes of a building site.

Everywhere in America we see vast developments denuded of trees and flattened by the bulldozer. This is commercial expediency.

A notable exception is Sea Pines Plantation on Hilton Head Island in South Carolina. This development, recently given a special award by the American Institute of Architects, uses the natural resources of this beautiful island to a maximum.

How beautiful America would be if a concerted effort were made for conservation.

Richard, L. Rice, AIA



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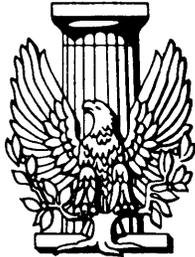
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HARWELL HAMILTON HARRIS, F.A.I.A.

ART AND LAYOUT
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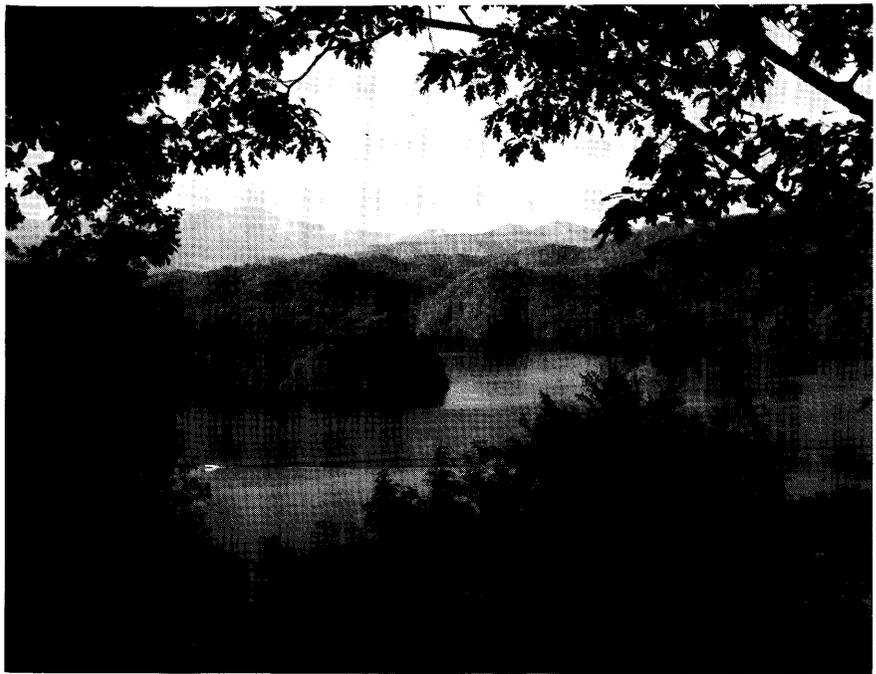
- 9 Letters to Editor
- 11 *Harwell Hamilton Harris*: editorial—why nature?
- 12 *Governor Dan K. Moore and Lieutenant Governor Robert W. Scott*: letters—why separate conservation and development?

CONSERVATION SECTION

- 14 *James C. Wallace*: our priceless heritage.
- 17 *A. W. Cooper*: salt marshes and estuaries, cradle of north carolina fisheries.
- 22 *David A. Adams*: a possible program for estuarine development.
- 26 *Keith A. Argow*: north carolina state parks today.
- 29 *Sheafe Satterthwaite*: nine-tenths "d" and one-tenth "c".
- 31 *Pearson H. Stewart*: a proper fusion of city and country in north carolina and selected policies to create it.
- 34 *C. Ritchie Bell*: the north carolina botanical garden.
- 36 *Milton S. Heath, Jr.*: north carolina record on conservation and prospects for the future.
- 39 *Margaret Click Williams*: beauty in north carolina, a public and private concern.

ARCHITECTURE SECTION

- 46 *MacMillan & MacMillan, Architects*: residence for mr. and mrs. william s. ward.
- 50 *Austin-Faulk, Architects*: stable for mr. joseph h. bryan, jr.
- 52 *Austin-Faulk, Architects*: country club of north carolina
- 56 *Six Associates, Architects*: grogan-reynolds dormitories.
- 58 *Six Associates, Architects*: commercial and social center for mountain retreat association.
- 60 *Six Associates, Architects*: american enka building.
- 61 *Six Associates, Architects*: east asheville community center.



WHY NATURE?

BY HARWELL HAMILTON HARRIS

Two concerns are evident in this special number of the NORTH CAROLINA ARCHITECT.

Our first concern is to save something of the natural world in which we evolved. This concern each North Carolina architect shares with all other North Carolinians.

Our second concern is to learn from nature the secret of creation; where possible, to design within the context of nature; where not possible, to discover in the context of the man-made community the workings of natural principle so that in what we do we add principle to principle.

Nature is the context for much of the North Carolina architect's work. Nature may also be the example the North Carolina architect needs most,—needs even more than he needs the examples of his contemporaries' work. Context and example: these are the two aspects of nature we shall discuss here.

Nature-as-context can be the great liberator. Because the natural place is the unique place, it invites the unique solution. It helps the architect clear his mind of past performances, free himself from many architectural conventions, begin at the beginning. It becomes a point of departure, the basis for differentiation, a guide to independent design. It is a promise of fresh influences, new encounters, surprises.

Nature-as-example can be a powerful stimulus to the architect's imagination,—and a guide to whatever originality there is in him. It is to be found in the single wildflower and also in the community life of a pond or valley.

The influence of nature-as-context is illustrated by some of the buildings shown

in this number. It is the interweaving of architecture and landscape, the reciprocity between buildings and site.

The influence of nature-as-example is less obvious. It is the influence of the plant organism, latent with promise and power, needing only space, soil, light and air to develop according to its own nature. Its relevance for the architect is expressed by Sullivan in his remark:

"All life is organic. It manifests itself through organs, through structures, through functions. That which is alive acts, unfolds, expands, differentiates,—organ after organ, structure after structure, form after form, function after function."

Is function, then, the message? Greenough explained:

"By beauty I mean the promise of function. By action I mean the presence of function. By character I mean the record of function."

If function is the message, how much more complex is function, as understood by Sullivan and Greenough, than function as understood by the architects of The Functional Style! To the latter, function may be only another word for utility,—often, mere expediency. Theirs is function without an organism. Its forms are a product of mechanical method rather than insight. Functionalism has become a matter of mere problem solving. It is the false simplicity of the unimaginative, a short cut to design, the justification for whatever is done or left undone.

It is the organism that gives meaning to function. And it is the organism—not the function—whose beauty, whose action and whose character we see. If the organism is a tree, we note how it grows from the soil or rock,—what its nature is,—how

it responds to sun, rain, wind, lightning. We note, too, that its nature does not change with each change of circumstance. It is still the same tree. By its continued response to changing conditions it demonstrates its versatility and its constancy. And if the organism is a building, we note how it grows out of the wooded slope or the city grid,—what its living purpose is,—what it tells of the person or institution that is its reason for being,—how it interacts with sky and view, or with its man-made neighbors and the flow of cars and people. We need not decide whether form follows function or function follows form,—or whether either follows the other. It is enough to see them together, complete and in perfect correspondence.

The analogy of the building to the plant—and of the manmade environment to the natural setting—can be carried far. But it is a mistake to press it. Its greatest importance to the architect is as a stimulus to his imagination, helping him to grasp intuitively what he cannot comprehend rationally. Excited by the variety and richness of nature's expressions, he sees in his imagination the idea from which will evolve the unique form. Where reason may have been restrictive, nature may be liberating.

"Natural" can mean many things to the architect. It can mean design in harmony with the innate qualities of the materials, or the relation of building to site, or the simplicity of the uncultivated, or the fitness of means to purpose, or the manner of growth. "Natural" can also mean a way of thinking. Since it is the nature of creation with which we are concerned, it is fortunate that nature's meanings are so various and that they are suggestions and not blueprints.

WHY SEPARATE CONSERVATION AND DEVELOPMENT?

In view of the fact that the 1967 General Assembly established a study commission to look into the feasibility of separating the Department of Conservation and Development into two separate agencies — one dealing solely with problems of conservation and the other with matters of development — the North Carolina Architect asked the Governor and the Lieutenant Governor of the State of North Carolina for their views on the subject.

To North Carolina Architect:

At the outset, let me emphasize that I am not proposing anything in regard to reorganization of the Department of Conservation and Development. I say this simply because there is at present a special study commission working on the matter. I have suggested, however, that consideration be given to the feasibility and desirability of dividing the functions of the Department among three departments. I have said that our present system is working well, but that this study gives us an opportunity to consider ways of improving it. I simply offer for consideration the division of present functions into separate departments of development, conservation and tourism. I emphasize again that I am not proposing solutions, but am merely offering suggestions for consideration and study.

Dan K. Moore
Governor
State of North Carolina

To North Carolina Architect:

There is in North Carolina today a healthy emphasis on industrial growth. Indeed, industry is vital because it means jobs and opportunities for thousands of our citizens.

New industries, along with the continued expansion of those already established here, are essential to the future of our state.

With this in mind, I have suggested that we must strengthen our search for industry by separating the functions of the Department of Conservation and Development into two distinct organizations.

The 1967 General Assembly set up a commission to study the proposal and to report its feasibility.

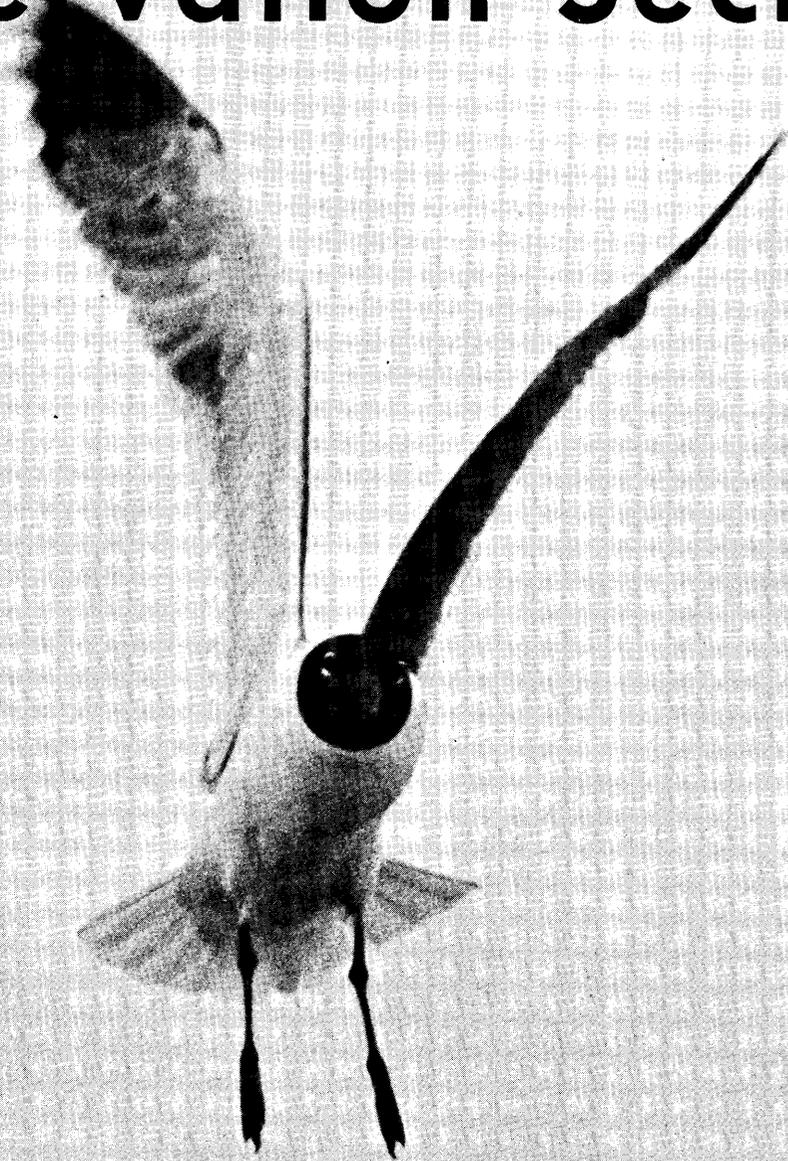
I think separation of C and D would be a timely step—one that would allow more specialization of activities in a “Department of Commerce” and a “Department of Natural Resources”.

The commerce department could include agencies that deal with industrial development, community planning, state ports and travel and promotion. The natural resources department could include water resources, state parks, forests and mineral resources.

At this time, it's good business to examine the agencies responsible for making the best use of natural resources. We must protect our resources, while allowing them to be carefully developed for use by industry.

Robert W. Scott
Lieutenant Governor
State of North Carolina

Conservation Section



Photograph by Tom Jackson, Courtesy North Carolina Wildlife Resources Commission

NORTH CAROLINA ARCHITECT, Volume 15, Numbers 6 & 7, June & July 1968

OUR PRICELESS

Or how things without price have no value at all and thus fall prey that in order to save the "priceless" we must first put a price on it;



SSHERITAGE

to things which have price tags on them. And what a paradox it is and soon, if it is to be done at all.

By

James C. Wallace

Associate Professor of Social Sciences
North Carolina State University

We live in a world of quantity. Our vast technology, with its unprecedented power, serves as the background against which the daily affairs of our society are carried on; and the habit of quantitative thinking, so difficult for former ages, has become a commonplace. Miles and hours, ergs and pounds, watts and Angstroms, dollars and drachmas. These words, and thousands like them, are the coinage of our time.

In the marketplace, where measure was born, every good and every service has its price, and when all of these are added together, we are pleased to refer to their sum as the Gross National Product. This concept, named with such exquisite aptness, represents a kind of national price-tag, an annual summation of our "production."

But there are many *unpriced* commodities — strangely enough we call them "priceless" — whose value is not reckoned on our national calculating machine. These are the basic resources which, until now, have always seemed to be in endless supply, and which have contributed the most to Man's happiness on this Earth. They constitute our natural environment—the air, the water, open space, wildlife, forests, quiet and beauty.

These irreplaceable resources, unprotected by adequate price-tags, are now being destroyed on a global scale. Yet, because the ultimate reckoning is only dimly perceived, and the economic gain lies near at hand, the appetite of our undirected technology, powered by a syndrome of growth and greed, continues to increase. Most of our leaders in business and industry remain mesmerized by the rising lines on the "production" charts. Few of them realize that the state of our economy is not wholly characterized by the rate of growth of the GNP. Fewer, still, seem to understand that a Gross National Product implies both a Gross National Consumption and a Gross National Refuse.

The rivers and lakes, the land and the air, are being fouled because they are free, because they are "priceless;" and if

they are to be saved, if, indeed, our civilization is to be saved, we must quickly place upon these elements of our natural heritage a "market price." As a guideline to the establishment of such a price system, we might begin with the most commonly used notion in the casualty insurance business, that of "replacement value." When America's corporate income and expense statements begin to show realistic figures for the damages inflicted by industry upon the environment, it will pre-empt the rapid and permanent decline of such destruction.

In short, we should not permit the word "priceless" when used to describe the great natural endowments of our land, to imply that these resources are without price, and hence may be corrupted free of charge. Rather, we must learn to treat our environment with that high degree of deference which is usually reserved for great and enduring works of art. Our "priceless" heritage, if generations yet unborn are to share its benefits, must be placed beyond the reach of our grasping times. It must be, in truth, *beyond* price.

But the here-and-now has clout to spare, for the short-term gain is hard to resist, and the long-term loss is hard to define. Thus the natural world declines and its counterfeit ascends, while a crude and blind indifference marks the change. An artificial world, domed and tamed for man alone, with wildness gone and nature banned, now lies in early prospect, and this awful vision, such a pallid recompense for what is being lost, enjoys the casual esteem of many people.

What, after all, some of them ask, does it really matter? Granted that Man has always been a part of Nature, has been a partner *with* Nature, does it follow that an artificial environment will be necessarily bad? And are we not, within a fairly short period of time, looking forward to manipulating our genetic structure, and thereby removing defects and improving the race? And, besides, if things go wrong, can we not take care of that situation when it arises?

Such is the simple faith that most of our citizens have reposed in our technology. It is this abiding trust in our unlimited capacities which muffles the voices of alarm and paralyzes corrective action.

It is difficult to explain, as the ecologists are finding out, that Man occupies only a niche, albeit a large one, in the scheme of things. It is hard to get across the idea that Man is a product, two billion years in the making, of his Earthly habitat. It is obscure, to many, that Man is part of a vast and complex web of life which had its beginnings in the distant ages of geological time. He is, in fact, what the world has made him, and he is attuned to its workings with a precision surpassingly fine. His cycles are the cycles of the universe he inhabits. His sleep and wake are the domain of the Earth's rotation. His genetic material, packed with painfully culled information starting with life's first day, lies within him in safety, as it has for millions of years, maintained there at an unchanging 37° Centigrade.

If Man has any meaning at all, then it is meaning in relation to his environment. Without that environment, Man is an absurdity; a mobile bi-pedal computer, programmed for a world long gone. Product of sun and rain and ice, and wind and wilderness, imprisoned within a sack of Pre-Cambrian sea water, watcher of birds and wisher for stars—how will it be to sit on the asphalt plain, alone beneath the sodium glow, the last of the partners in the great adventure?

This is our ultimate fate. If we persist in destroying our environment, we shall destroy ourselves, for we are nothing without it. And should the day come when we finally succeed in separating ourselves from the last vestige of our inheritance, let us not mistake this sad occasion for some species of conquest, for it will be no such thing.

It will be the end of a lengthy retreat, and the beginning of an endless wandering through the reaches of an indifferent universe, in search of a meaning which was left behind.



Estuaries provide food and protection for coastal fish and shellfish, a \$100,000,000 industry.

What is good for the estuaries is good for North Carolina.

SALT MARSHES AND ESTUARIES CRADLE OF NORTH CAROLINA FISHERIES

By
A. W. Cooper
Associate Professor of Botany
North Carolina State University

Most visitors to the North Carolina coast are aware of our vast tidal salt marshes. The summer greens and autumn golds of these seaside meadows lend beauty to our coastal scenery. Although many have experienced the beauty of our tidal marshes, few are familiar with their value and the role which they play in the economy of our coast.

Salt marshes are but one part of a larger system, the estuary, and they are best understood in this light. An estuary is a coastal body of water where fresh river water, flowing from the land, meets salty ocean water. Salt marshes occur in temperate latitudes and form in areas behind barrier beaches or on the edges of protected bodies of water where the substratum is waterlogged. The waters flooding these marshes may be salty, brackish, or almost fresh and the flooding may occur rhythmically, as a result of lunar tides, or irregularly. North Carolina, with more than 2,000,000 acres, ranks third in the nation in total acreage of its estuarine waters. In addition, there are over 150,000 acres of salt marshes associated with our estuaries.

Estuaries, and their associated marshlands, are among the world's habitats most productive of life. Here, where there are abundant nutrients and warm, shallow waters, plants fix vast quantities of solar

energy. Much of this energy eventually finds its way from the estuary into the ocean and is spread along the coast providing nourishment for marine animals in the shallow waters of the continental shelf. Thus, salt marshes are a part of a vast, open estuarine system which reaches from the land into the open ocean.

Two major types of salt marsh, *regularly-* and *irregularly-flooded*, occur in North Carolina. There are 58,400 acres of regularly-flooded salt marsh, primarily distributed from the South Carolina line to Beaufort. Virtually all marshes in Brunswick, New Hanover, Pender, and Onslow Counties are of this type. More limited stands occur along the Outer Banks north to Oregon Inlet. These marshes develop on a substratum of deep, gray, soft silt and, as their name implies, are regularly-flooded as a result of twice-daily lunar tides. Tides range from two to five feet and creeks wander in an intricate pattern across the surface of the marsh. Smooth cordgrass is the dominant plant of these marshes, occurring in extensive stands from an elevation of mean sea level to about the mean spring high tide line. Along the soft creek banks the grass is tall, from four to six feet, but it diminishes in height to less than a foot in the interstream areas. Irregularly-flooded salt marsh is the most extensive of the

coastal marsh types in North Carolina, covering over 100,000 acres primarily north and east of Beaufort along the Outer Banks and on the inner side of Pamlico Sound in Dare, Hyde, Pamlico, and Carteret Counties. The substratum here is sandier and firmer and flooding with brackish water, caused by wind, rather than lunar tides occurs at irregular intervals. Tides seldom exceed a foot and creeks are shorter and less intricately branched. Black needlerush is the dominant plant of these marshes. It occurs in vast pure stands which stretch away like a monotonous gray-green sea. Salt meadow grass also is present, but at a slightly higher elevation than black needlerush.

Relatively speaking, a great deal is known about the relationships between salt marsh plants and the physical factors of their environment. For example, it is known that the length of tidal inundation, as determined by elevation of the marsh, is critical in determining the drainage and salinity characteristics of the habitat. These, in turn, are major factors in explaining the obvious zonation of plants in salt marshes. It is also clear that most reproduction of salt marsh plants is by underground stems rather than by seeds. Little is known, however, about the ways in which these plants are adapted to cope with the stresses of salinity and constant

A "wasteland" which produces more plant material per acre than most cultivated land—and transports the food produced to the animals in the estuary and in the shallow seas where most marine animals live.

water-logging. Also, although little is known about seed behavior, it is primarily by this means that salt marsh species invade new habitats. Organic matter from marshes washed out by the tide feeds ocean fish.

Of much greater importance to a discussion of estuaries, however, is the information obtained by ecologists concerning the movement of energy through salt marsh plants and animals, for it is from this story that the concept of the intimate relationships between salt marshes and estuarine waters stems. The plants in the richest of our regularly-flooded coastal salt marshes fix enough of the sun's energy so that, on the average, over 10 tons of plant material per acre per year are produced. This rate of productivity compares favorably with that of many natural communities and exceeds the average rate of production of most of the world's cultivated crops. Although much of this energy is used by the plants and animals of the marsh, a significant amount is washed out of the marshes by the tide in the form of small particles of organic matter. This organic matter, in part accounting for the gray color of tidal marsh water, is redistributed throughout the estuary and into the adjacent ocean. Because of the high silt content of estuarine water, the rate of production of minute floating plants is diminished. Consequently, food materials produced in the marsh make up one-third to one-half of the total food available to the animals of the estuary. Thus there is a continuous chain of life from the salt marsh into the shallow ocean near the land. Abundant data support these generalizations but they come primarily from studies of regularly-flooded marshes. The situation is not so clear with regard to irregularly-flooded marshes, for there are fewer data. Those available suggest that, although plant production is not much lower than in the regularly-flooded marsh, there is little tidal flushing. Consequently, irregularly-flooded marshes appear to make a more limited contribution to the food available in the estuary.

Organic Matter, Washed by Tides from the Marshes, Feeds Ocean Fish



Photo by Jack Dermid, Courtesy North Carolina Wildlife Commission.



Courtesy Research & Development Section, Division of Commercial & Sports Fisheries

In order to understand why this chain of life which originates, in part, in the salt marsh is important to our coastal and sports fish and shellfish, one must understand how these resources are distributed in the ocean. The vast bulk of these ani-

mals occur near the land, where there is an abundance of food and shelter, rather than in the open ocean. The shallow seas near the land are highly productive whereas the open ocean is a watery desert.

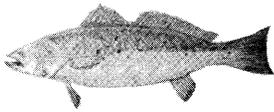
The great majority of our coastal fish

and shellfish species depend on estuaries for food, for a place to live, or for a place in which their young may develop. There are three major patterns of estuarine dependence among these animals.

Various species use the estuaries as:

a residence, living their entire life in the estuaries.

Sea trout



Oysters



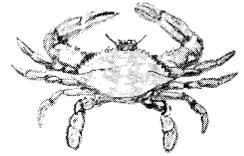
Clams



Bay Scallops



Blue Crab

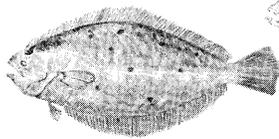


a nursery. Adults live and spawn in the open ocean with young migrating to the estuaries to mature.

Shrimp



Fluke



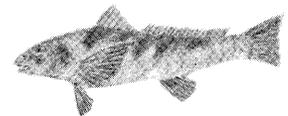
Blue Fish



Menhaden



King Whiting

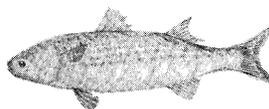


a temporary home. Adults migrate to the estuaries to spawn. The eggs hatch there and the juveniles reach young adulthood before migrating back to the ocean.

Weakfish

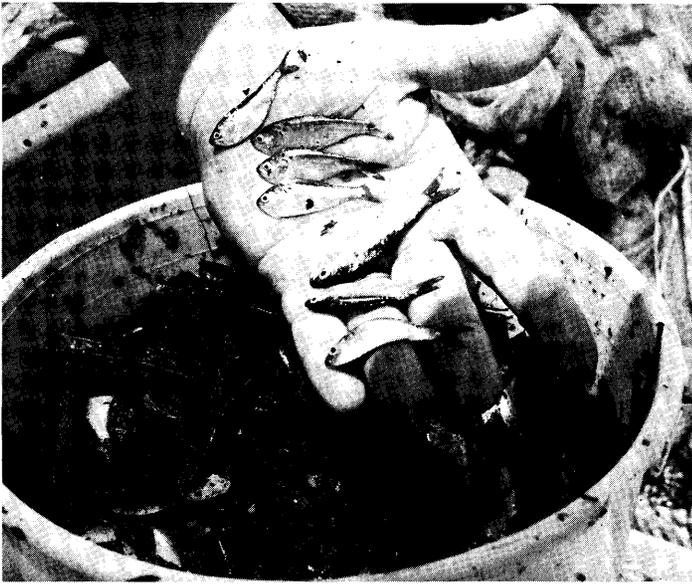


Mullet

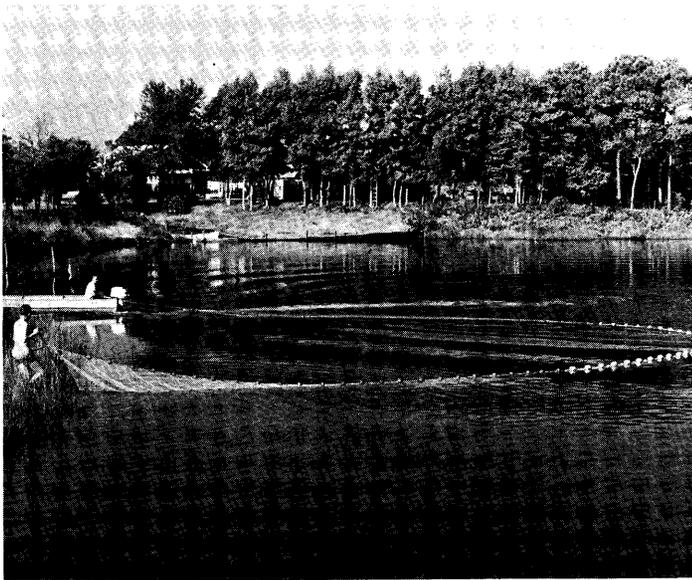


Black Drum





Sample of juvenile Atlantic Menhaden from Broad Creek near Bogue Sound, N. C. Menhaden are estuarine dependent during the first year of life and are the largest commercial catch in North America.



Biologists using hand seine to sample for abundance of juvenile Atlantic Menhaden in Broad Creek near Bogue Sound, N. C.



Purse seining for adult Atlantic Menhaden near Cape Lookout, North Carolina.

Photograph courtesy U. S. Bureau of Commercial Fisheries, Beaufort, North Carolina.

Biological values translated to dollars and cents

What is good for the salt marshes is good for North Carolina

So far our story of the value of salt marsh lands and estuaries has been developed in terms of biological values, in terms of feeding and rearing sites for groups of animals, many of which are of considerable importance to man. Is it possible to attach a "dollars and cents value" to estuarine lands? Is it possible to reduce biological values to terms which are comprehensible in man's economic framework? Some feel it is not. Despite this, I shall attempt such a presentation using data compiled by the Division of Commercial and Sports Fisheries of the North Carolina Department of Conservation and Development.

There is a sizeable segment of our coastal citizenry which makes its living directly from the sea. There are perhaps 5,000 of these commercial fishermen in North Carolina and, in most cases, they are almost entirely dependent upon estuarine resources for their livelihood. In 1965, these men received about \$9,400,000 for the almost 226,000,000 pounds of fisheries products which they landed. These catches were processed and retailed and if, as some economists contend, their value in the process increased by a factor of seven, then their ultimate value was about \$66,000,000. Further analysis of these catches indicates that nearly 97% by weight (219,000,000 pounds), was of species which are in some way estuarine dependent. These species accounted for 85% of the total value of the catch, or about \$8,000,000. Thus, the total value of the commercial resources taken from North Carolina's estuaries in 1965 may be estimated to have been in the vicinity of \$56,000,000.

Sports fishermen also exploit our marine resources. A survey now being conducted at North Carolina State University indicates that more than 400,000 sportsmen fish annually on our coast. On the average, each east coast sports fisherman spends \$80 each year for the gas, lodging, equipment, charters, and supplies which he uses during this fishing. If this figure applies to North Carolina, then the total expended by sports fishermen in this State annually approaches \$32,000,000. The greatest bulk of this money is spent fishing for estuarine dependent species.

Thus, commercial and sports fishing in North Carolina, on an annual basis, are the equivalent of a \$100,000,000 industry. A very high percentage of the species sought ultimately depend in one way or another upon our salt marshes and estuaries for the conditions necessary for their survival. Our 2,150,000 acres of sounds and marshes are involved in the return of



Adult Atlantic Menhaden concentrated in purse seine prior to being pumped aboard carrier vessel.

Photograph courtesy U. S. Bureau of Commercial Fisheries, Beaufort, North Carolina.

nearly \$50 per acre per year to the economy. Although it is obviously not possible to attribute all of this yield to our estuaries, they nevertheless are the most essential ingredient in what is clearly a very profitable business for North Carolina.

From what has been said, it should be clear that what is good for our salt marshes and estuaries is good for North Carolina.

Unfortunately, much of what we are now doing to our salt marshes and estuaries is not good for them. They are subject to continued destructive pressures and each year the acreage of unpolluted,

undespoiled estuary diminishes. Clearly, we must devise some better method of managing our estuaries or our coastal sports and commercial fishing industries are certain to suffer. It is impossible to manage a resource, such as a species of fish, without also being able to manage the habitat upon which that species depends. Management implies control and control often infringes on the rights of individuals. However, we must be willing to make the sacrifices necessary in order to insure the continued prosperity of our estuaries and our fisheries resource.

Can we balance the claims of protection and development in our salt marshes?

Can we reconcile the conflicting interests of hunters, fishermen, bird watchers, industrialists and real estate developers?

A distinguished scientist, aware of political realities, tells how.

A POSSIBLE STATE PROGRAM FOR ESTUARINE DEVELOPMENT

By
David A. Adams
Director, Fisheries Commission
North Carolina

So coastal marshes and shallow waters are important. So they're important for hunting, fishing, boating, bird-watching, land development, and navigation. So what? "What" is that many of these uses are incompatible on the same area. "What" is that environmental changes resulting from some uses are irreversible and preclude equally-desirable uses for all time to come. "What" is that there's a definite limit to the amount of such areas available to this and succeeding generations and that decisions made now will be binding on these future generations. And, perhaps most pathetically, no one is in a position to make the necessary policy decisions, no one is effectively attempting to determine the proper mix of competitive uses, no one has the necessary responsibility and authority.

As a result, marshes, tidal creeks, flats, and shallow waters are being engulfed, bit by bit, by real estate development and dredging spoil, without any apparent rhyme or reason, without any plan or rationality, without realizing that the major attractant, *i.e.* the typical coastal landscape, is being destroyed by those who are attempting to capitalize on that same attractant. Not that all development is bad, for there must be access and accommodations for those who wish to enjoy our

coastal areas (and contribute to the local economy through their enjoyment). The issue here is not one use or the other applied to the entire system, but each use in its proper place, and all in proper perspective.

In most cases, the profit motive is sufficient to encourage those interested in land development to keep up with demand. It is the contrary use, preservation of sufficient area in at least quasi-natural condition, that deserves the attention of the public at large. What must be done if such an endeavor is to be successful?:

An element of the population must recognize the importance of rational use of estuarine areas and actively work toward preserving some portion of these lands and waters.

For generations we have viewed the coastal waters and marshlands as an infinite resource, fully capable of withstanding the puny efforts of man to alter it in any significant manner, fully capable of providing a bountiful supply of fish, fowl, and recreation for all who wished to partake. For past generations, this attitude was probably realistic, for supply far exceeded demand and our capability for

altering the landscape was limited. Today's generation cannot afford such complacency. On a national level, the number of saltwater sport fishermen increased 38% between 1955 and 1960, and another 32% between 1960 and 1965 (U. S. Department of the Interior, 1966). Now on the North Carolina coast, there are more than 400,000 sport fishermen competing with about 5,000 commercial fishermen for the same fish. Annual attendance at Ft. Macon State Park increased from 357,965 in 1956 to 599,149 in 1966; visitors at Cape Hatteras National Seashore, during the same period increased from 301,740 to 1,133,003. The U. S. Army Corps of Engineers issued no permits for land development projects in 1965; four in 1966, and nine during the first ten months of 1967.

Slowly, people are beginning to realize that this resource is not infinite, that it is being changed by the hand of man. The oystermen are concerned that traditional oystering areas are being closed because of sewage pollution. The fishermen are concerned that they are not catching as many fish as they wish. The bird watchers are concerned that subdivisions are springing up where shorebirds used to feed. The aesthete is concerned that he can no longer gaze upon an unbroken expanse of primeval landscape. But each is



A SALT MARSH

One of North Carolina's most productive areas



WHAT PRICE TRAILER CAMP?

Is this an intelligent use of an irreplaceable natural resource?

Photos courtesy Research and Development Section, Division of Commercial Sports and Fisheries

concerned with his own interest, and there is no unifying agent which brings all users together in common understanding of the resource as a whole.

Some public agency must be assigned responsibility for the program, and must be given the necessary money, people, and time with which to implement it.

Who shall bring these diverse groups together in the common interest? The North Carolina Wildlife Federation? the Garden Club of North Carolina? the League of Women Voters? All these groups have led the fight for conservation issues in the past, but none has yet come forward to save our estuaries and coastal marshes. Unless someone does, no public program can be successful.

Just as there has been no unified effort outside of government, there is also no unified effort within government. A number of local and state agencies have responsibilities in these areas, but none is considering the coastal lands in their entirety. Municipal and county agencies conduct land-use of various sorts and enact zoning ordinances as a means of controlling land use, but most of these efforts are of a local nature, aimed more at what types of development should be permitted on a given area of land rather than whether development should be permitted at all. Within the state government, the Wildlife Resources Commission has jurisdiction over hunting and motorboat safety in coastal waters; the Department of Conservation and Development regulates fishing and mineral exploitation, and assists local governments in planning; the Department of Water and Air Resources controls pollution, navigational development, beach erosion and hurricane protection; the State Board of Health is concerned with the sewage pollution in shellfish growing areas; the Department of Administration has jurisdiction over state-owned lands and waters.

As a result no single agency views the estuaries as its sole responsibility and "that which belongs to everyone belongs to no one." If a comprehensive estuarine program is to be successful, some public entity must be given the responsibility and authority to carry it out. This entity could be one of the existing state departments, a division guided by a special board drawn from several departments, or a special committee or board established for the purpose.

Coastal areas must be inventoried and classified as to their best use, and those which must be preserved in the public interest identified as such.

Since 1933, the Soil Conservation Service has been classifying interior land as

a means of determining its best agricultural use. Planning agencies classify land as to its best type of development. Fish and game agencies classify land as to its greatest potential for wildlife management. But no one has taken a comprehensive look at our great expanse of coastal land with the aim of guiding a balanced development for all uses.

At the present time the State doesn't really know how much of our shallow coastal waters are in State ownership (although almost all of them probably are), how much of the coastal marshlands are privately owned (although almost all of them probably are) nor how much of these types of areas and which specific areas need to be under public control in order to provide recreational opportunities for future generations. In essence, we need to have an inventory by ownership, type of land, potential for development, natural resource value—of all the lands and waters of North Carolina's vast estuarine system. This will be no easy job—more than 2 million acres of water [USFWLS, 1955] and about 160,000 acres of marsh (Wilson, 1962) are involved—but no rational plan for management can be evolved until the resource has been inventoried.

A large scale program of control and acquisition, involving a number of alternative methods, must be developed for those areas which should be reserved for public use.

Even under existing laws, local and state governments have some measure of control over development in the estuaries. Counties and municipalities are empowered to enact zoning regulations, thereby restricting the types of developments that may be permitted. Zoning regulations may be sufficiently restrictive as to prevent any structures and all land alteration, but examples of such severity are few and far between. From a realistic viewpoint, it seems unwise to entrust local zoning authorities with the primary responsibility for comprehensive planning of estuarine use. A state-wide program, based on knowledge acquired through the study discussed above, would probably stand more chance of success.

At the present time, the State does, or at least can, control the development of most land covered by water, and much of the peripheral tidal marsh. Ownership of land beneath navigable water is in the State, and such land cannot be conveyed from the State. Those wishing to fill such lands adjacent to their privately-owned high land must secure an easement from the Department of Administration, approved by the Governor and Council of State. By refusing to issue such easements, the State can prohibit filling of lands be-

neath navigable waters, and, to a lesser degree, control development of adjacent land which includes water connections to navigable waters. In addition to the state easement, all persons desiring to do work below the elevation of Mean High Tide in areas adjacent to navigable waters must secure a permit from the U. S. Army Corps of Engineers. Applications for these permits are publicly advertised, and all individuals and state agencies have the opportunity to oppose issuance of such permits. In recent years, the Corps of Engineers has become much more responsive to the recommendations of natural resource agencies, and now will rarely issue a permit over a resource agency's objection.

At first glance, the above procedures might appear to provide adequate means of regulating the development of estuarine areas. There are, however, a number of complicating factors. The term "navigable waters" has never been defined adequately in law. Thus, waters which appear navigable to the State may appear non-navigable to the developer, and only a court can determine who is right. Furthermore, until the State determines which estuarine areas should be held inviolate, and which can be altered without excessively impairing the public resource, it runs a double risk of thwarting desirable development or permitting undue resource damage.

Thus, it appears that public acquisition provides the only definitive solution. The Department of Conservation and Development has powers of eminent domain, and can condemn land "in the administration of laws relating to fish and fisheries." [C.S. 40-2. (6)]. The Board of Conservation and Development can purchase lands for "enterprises related to the conservation of marine and estuarine resources." [C.S. 113-226(a)]. Once the locations of significant marsh areas are established, they can be acquired by the State if funds are available.

While it is impossible at the present time to estimate precisely the amount of money needed, some rough approximations may be made. There are about 60,000 acres of regularly-flooded salt marsh (low marsh) in the state (Wilson, 1962), almost all of which is of prime importance for fisheries and recreation. If 90% of this area were acquired at \$150 per acre, it would take \$9 million. Legal fees and land surveys would add considerably to the cost; discovery of lands which are already in the State would reduce the cost. Acquisition of selected areas of irregularly-flooded salt marsh (high marsh), fresh-marsh rights-of-way, access, etc., would probably add an equivalent amount, bringing the total bill to about \$18 million. A land acquisition program of this size would take several years to execute. Land prices are escalating rapidly, however, and any delay would increase the cost significantly.

Where would the money come from?

The General Assembly

There are several alternatives, all of which have some weaknesses. The General Assembly could appropriate the necessary funds as part of a biennial Capital Improvement Budget. This method has the advantage of spreading the cost among all taxpayers and would provide a lump sum which could be spent over a number of years. It seems unlikely, however, that such a sufficiently large amount would be appropriated during one biennium; the program would thus become dependent upon additional appropriations during succeeding bienniums—a risky business at best.

A Special Bond Issue

A second alternative would be through a special bond issue. Prior to 1962, New York had passed a \$75 million bond issue, and New Jersey a \$60 million bond issue for acquisition of recreational land (Outdoor Recreation Resources Review Commission, 1962). Subsequently, other states have adopted similar proposals. Like a direct appropriation, this method spreads the cost among all citizens and provides funds which could be used over an extended period. However, a bond issue of this magnitude would require enabling legislation and a vote of the people, and thus would entail considerable public support.

A Sport Fishing License

A sport fishing license for coastal waters provides a third possibility. At the present time, no license is required of non-commercial hook-and-line fishermen in most estuarine waters. If our estimate of 400,000 coastal sport fishermen is accurate, a modest license fee, over a period of time, could provide sufficient funds for the program. Coastal sport fishing licenses are being required in an increasing number of states, and there has been some talk of such a requirement in North Carolina. Before such a system were instigated, however, some jurisdictional problems between the N. C. Wildlife Resources Commission and the Division of Commercial and Sports Fisheries need to be resolved. Considerable opposition

might be raised, too, by out-of-state fishermen, tourist interests, and resident fishermen who are already buying a license for inland fishing, trout fishing, wildlife management area access, etc.

A Motor Fuel Tax

During 1964, North Carolinians operating registered gasoline-powered motorboats consumed 6,600,000 gallons of fuel, taxed at the rate of 7¢ per gallon (A Survey of Fuel Usage in Registered Motorboats in North Carolina, RTI, Durham, 1965). Six cents per gallon, or \$396,000 was refundable upon application, but only \$38,000 of this amount was actually refunded. The remaining \$358,000 remained in the highway fund. An estimate of North Carolina's refundable marine fuel tax derived from a survey by the Outboard Boating Club and the National Association of Engine and Boat Manufacturers in 1965 is even higher—\$943,880 (N. C. Wildlife Resources Commission, personal communication).

Whatever the precise amount, motorboat operators probably contribute more than a half million dollars to the highway fund each year through failure to claim their fuel tax rebate. The 1967 General Assembly provided that the "Wildlife Resources Commission shall receive one-eighth of one percent ($\frac{1}{8}$ of 1%) of the net proceeds of the taxes on motor fuels" (G. S. 105-446.2) during the 1967-69 biennium, but will then have to request a continuation of any such funds from the 1969 General Assembly. This authorization will provide the Commission with about \$125,000 per year for its boating program, leaving something in excess of \$400,000 per year in the highway fund. Tapping a portion of these funds would provide a continuing source of revenues which could be used in an estuarine acquisition program. However, any efforts to use this source would be met with opposition from the State Highway Department, as they were during the 1967 General Assembly. Furthermore, it appears that the Wildlife Resources Commission has a logical cause in asking for moneys derived from motorboat users for its motorboat program whereas use of this source for an estuarine acquisition program would be placing the burden upon only a small segment of estuarine users.

Federal Funds

Whatever form of State funding is utilized, federal funds may be available under the provisions of the Land and Water Conservation Fund Act of 1965 (78 Stat. 897). This act, "to assist in preserving, developing, and assuring accessibility to all citizens—such quality and quantity of outdoor recreation resources as may be available and are necessary and desirable for individual active participation in such recreation," provides federal funds on a 50-50 basis for "the acquisition of land, waters, or interests in land or waters." Earlier federal reports (Outdoor Recreation Resources Review Commission, 1962b) stress the need for federal assistance in the acquisition of recreational lands and the critical need to preserve shorelines and waters for recreational opportunities. Thus, it appears that the State may be required to pay only half the total bill for an estuarine acquisition program.

So really it boils down to a matter for the people of the State to decide. If they are really concerned enough, some entity can be charged with the overall estuarine preservation-development program, coastal areas can be inventoried and those which must be protected identified, private alteration and use can be regulated, and funds necessary for acquisition can be provided. Hopefully, our citizens are now ready to recognize the seriousness of the present situation and willing to do something about it. If not, we must wait until some future date; in the meantime, we may lose forever a part of our heritage.

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Is North Carolina's position as 44th among all states in expenditures for parks good enough?

NORTH CAROLINA'S STATE PARKS TODAY

By
Keith A. Argow
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Of all the public lands in North Carolina devoted to conservation and recreation where people may go to hunt, fish, camp, visit historic sites, view nature, or merely get away from it all, only 22,000 acres are administered by the State Park System. The other public lands consist of national park areas, the intercoastal waterway, national forests, historic sites, county and municipal parks, public hunting and fishing grounds, one state forest and several reservoir recreation areas. These are administered by a variety of agencies: the National Park Service, the U. S. Forest Service, the U. S. Army Corps of Engineers, the Bureau of Sports Fisheries of the U. S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the N. C. Department of Conservation and Development, the Department of Archives and History and the John H. Kerr Reservoir Development Commission.

If it had been up to the state of North Carolina the acreage might be even less. The Federal government has donated four parks: Umstead, Fort Macon, Jones Lake and Singletary Lake Group Camp and contributed for the development of several others. Private sources donated six: Mt. Jefferson, from citizens of Ashe County, Weymouth Woods Nature Preserve (with a reverter clause to the Nature Conservancy) from Mrs. James Boyd, Duke Power State Park from the Duke Power Company, Hammocks Beach State Park from Dr. William Sharp and The Hammocks Beach Corporation, and Hanging Rock State Park, from a group of citizens interested in preserving a portion of the Sauratown Mountains. Other gifts from

private individuals include the Cliffs of the Neuse State Park, Cape Hatteras State Park (now part of Cape Hatteras National Seashore) and Rendezvous Mountain (eliminated from the State Park System in 1956.)

Joint public-private donations account for two: Morrow Mountain from Stanly County and local landowners, and Pettigrew, from the Federal government supplemented with 500 acres from Lake Phelps Farm, Inc. Mount Mitchell, purchased from state funds in 1915, was the sole entire state purchase prior to 1967.

During the early years of the State Parks System, almost all park facilities were contributed by the Federal government. In 1947 the State provided the first funds for capital improvement. Since then it has gradually increased its interest in the park system. In 1955 the State Board of Conservation and Development ruled that state parks must contain at least 400 acres of land, possess distinctive scenic values and excellent recreation possibilities. The Board also approved a long range park acquisition and development plan, although it was never financed and put into action.

In the meantime a burgeoning population with new leisure, has created the need for recreation facilities close to the larger centers of population, particularly in the so-called Piedmont Crescent between Raleigh and Charlotte. To help meet this situation the North Carolina Recreation Commission recommends that the Division of State Parks establish supplemental state recreation and park areas which, though not possessing all the qualifications demanded for state parks, would

accommodate high density visitor use.

Foremost among opportunities to be included in this recreation area system are reservoirs planned or already constructed across the state, shorelines proposed for state beaches, scenic waterways, and mountain parkways.

The high density park system should be created in addition to, and not from, the twelve beautiful and hard won State Parks now existing. A recent plan for developing Umstead State Park near Raleigh has drawn fire from conservationists who, while recognizing the need for high density recreation in the State Capital area, feel that this plan did not give enough attention to the superlative natural features and beauty of the park. The tract, which is laced by deep stream valleys and graced with flowering rhododendrons, is the only publicly owned land in the entire North Carolina Piedmont which meets the standards of a Class IV, Unique Natural Area, approved by the President's Outdoor Recreation Resources Review Commission.

The year 1967 gave many signs that the people of North Carolina are taking a new interest in conservation and state parks. The State Planning Task Force and the North Carolina Recreation Commission began compiling data for an outdoor recreation plan to make the state eligible for park acquisition and development from the U. S. Department of the Interior under the Federal Land and Conservation Fund Act of 1965. The 1967 General Assembly appropriated \$375,000 for a new State Park (the first total acquisition since 1915) and additional land for others. It also set up a State Park and

State Forest Study Commission to evaluate North Carolina's park and forest facilities and to make recommendations to the 1969 General Assembly.

Citizen conservation groups are spearheading the movement to create a first class State Park System. The Conservation Committee of the North Carolina Academy of Sciences is working to establish Smith Island and Cape Fear as a State Park. Local committees of the Nature Conservancy are sponsoring Bat Cave, and the Enco River Gorge as scenic natural areas. The North Carolina Seashore Commission is advocating the acquisition of Masonboro Island for a new seashore state park. The North Carolina Wildlife Federation is giving broad support for state parks and wise resource management. The Pilot Mountain Preservation and Park Committee, Inc. in Winston-Salem is pushing the Pilot Mountain State Park project. Citizens in the northwest corner of the state are trying to establish Stone Mountain as a State Park. The Carolina Mountain Club has aided in securing alternative routing to the proposed second transmountain road through the Smokies, thereby preserving the largest tract of mountain wilderness in the southeastern United State. A general ground swell for conservation is coming from the state's garden clubs, the Atlantic Chapter of the Sierra Club, the Audubon Society, the 4-H Clubs and the Future Farmers of America.

North Carolina's State Parks, though few in number, are a credit to the State. This tradition of quality must be supplemented by adequate quantity to give more Tar Heels the opportunity to know and enjoy the outdoors. More parks are clearly needed, particularly close to the population centers.

Many states use a rule of thumb that requires 3 acres of land for each 100 persons for State Parks and Recreation Areas, and recommend an additional 3 acres for municipal and county recreation. According to this formula, 136,600 acres in State areas would have been desirable for North Carolina's population in 1960. By 1980 this figure will rise to 163,500 acres. At the present time 100,000 acres more than the land and water areas in the state parks and the Kerr Recreation area are needed to bring N. C. up to this standard. Private recreation operators can bear some of the load, but they can't afford to finance large tracts for scenic beauty and open space.

Should private citizens and other donors continue to bear a major responsibility for urgently needed new State Parks? In recent years some 30 states, including neighboring Virginia, have passed bond issues for park acquisition and development. A \$30 million bond issue would meet currently anticipated needs and cost less than \$6 per citizen. This is only 1/10 of the recent Better Roads Bond passed by voters in 1965.

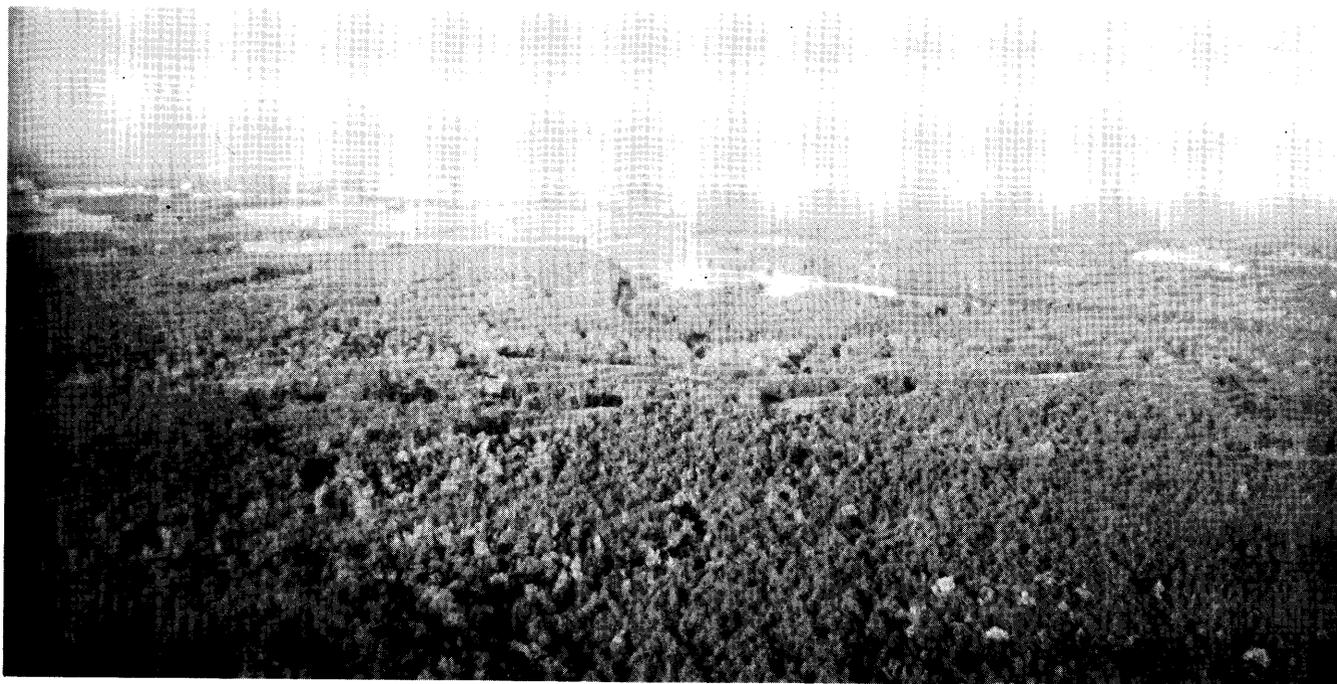
Right now there is a good opportunity for interested citizens to come to the aid of State Parks by supporting the newly authorized State Park and State Forest Study Commission. After all, when you are number 44, you have to try harder!

ADDITIONAL READING

1. N. C. Department of Conservation and Development. Division of State Parks. *North Carolina State Parks at the Crossroads*. Raleigh. 1961. 11 pp.
 2. Wicker, Warren J. and S. Kenneth Howard. *Perspectives on Local Finance in North Carolina*. Institute of Government. Chapel Hill: 1967. 98 pp.
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 5. U. S. Department of the Interior, Bureau of Outdoor Recreation. *Recreation Land Price Escalation*. Washington, D. C. 1967. 33 pp.
- N. C. Recreation Commission, "Proposed State Intermediate Park System" Raleigh. 1968. 5 pp.

UMSTEAD STATE PARK its superlative natural features once destroyed can never be replaced.

Photograph by Keith A. Argow



SMITH ISLAND LIGHTHOUSE NEAR SOUTHPORT, NORTH CAROLINA



Photograph courtesy Travel Information Division, Department of Conservation and Development

Smith Island's 8,000 acres of salt marshes, associated creeks, shallow waters and bays provide:

A piece of living history—Stable dunes and forests show the continent as it was 400 years ago.

A site for scientific research—Coastal lands, free from the influence of man, allow the study of beach erosion and formation.

An economic resource—Salt marshes provide the food and shelter for 95% of our fish and shellfish at some time in their lives.

A Young Conservationist Looks at North Carolina and Makes Some Suggestions

A State Department of Natural Resources to handle all conservation problems

A State Department of Planning and Administration to base long-range decision-making on a comprehensive knowledge of natural resources development, human resources development, and economic development

A State Developmental Experimental Station to test housing and other design and construction methods

A program of Environmental and Basic Design Teaching to train children to know and care about their physical surroundings

NINE-TENTHS D AND ONE-TENTH C

By
Sheafe Satterthwaite
Center for Environmental Studies
Williams College

Like most of America, North Carolina exhibits only a meager respect for its natural resources. (Some observers would counter that the State shows plenty of *economic* respect for its natural resources. I'd suggest that this kind of respect is not truly economic, since it takes little account of the long-range effect of today's actions.) Certainly the State's landscapes are not being maintained at their maximum potential of biological richness, a richness identified by a maximum fertility or maximum diversity of living species.

The State and its people will have to pass through an arduous political evolution before their lands, waters and other resources can be declared healthy or capable of self-renewal. For there are a host of values woven into our economic and social fabric as a nation which mitigate against conservation, or a prudent relationship of man to his environment. Among these mitigating strands I would single out this nation's depending on an

ever-increasing gross national product, an ever increasing population, and indeed a general transcendancy of materialistic values. Within the conservation establishment itself economic values may predominate even though most living and non-living things (whether pebbles or diatoms, weeds or spiders) cannot be assigned a dollar and cents equivalent. Besides our reliance on economic goals, other national values which mitigate against conservation are: the "divine right of private property" which the integration battles have also confronted; the "profit motive" which is so characteristic of our business life; and a Christian heritage which is ambiguous in defining man's obligations to the land and other living things.

Compared with such states as Massachusetts and Wisconsin, North Carolina is no current leader in conservation policy or accomplishment. Examples of environmental depletion or despoliation in North Carolina are:

The State's largest river, the Cape Fear, is an open sewer which increasing industrial usage, without proper safeguards, is turning warm, a deleterious, death-rendering alteration known as "thermal pollution." *The unprotected mountain valleys*, lying outside park and forest boundaries, are becoming crass commercial strip developments.

The State's cities are rapidly developing every mistake large cities in the Northeast have created. Built-up areas are not integrated into the landscape; instead, the topographical features are bulldozed away and the vegetation is obliterated.

The State park system is dependent for future parks on random philanthropic urges rather than on a rational, sequential acquisition policy.

The drainage of the coastal plain proceeds without any research into the probable long-term cumulative effects.

The Great Smokies, the East's most important national park displaying primeval

forest conditions, requires for future survival the upholding of stronger wilderness standards by both the Federal and State governments.

The barrier sand dunes and coastal vegetation which protect the State's Atlantic shoreline are being rapidly obliterated by tawdry, suburban, grid-iron developments—tomorrow's slums.

In my estimation there are several pressing actions which the State and its citizens should take forthwith if their natural resources are to be correctly used by present generations and enhanced for future generations.

Department of Natural Resources

A first priority, therefore, is the reorganization of North Carolina's scattered conservation agencies into one Department of Natural Resources. This idea is not new. In a milieu so excited about economic progress most North Carolinians have acquiesced in a Department of Conservation and Development which is, as its critics lament, "nine-tenths 'D' and one-tenth 'C'." (Even regarding development, this department's horizons are severely limited; sound economic development is neglected by a small-town Chamber of Commerce mentality capable only of strident promotion for tourism and for industry.) At the same time, successive administrations, preaching fiscal responsibility, have perpetuated a duplicative and wasteful conservation law enforcement system, with separate wardens or inspectors for fisheries, for game, and for other divisions.

Department of Planning and Administration

When the dispassionate observer remembers that as early as 1929, the Wisconsin legislature extended the power of zoning to rural areas, he must realize that North Carolina has a long way to go. I trust that planning will be placed in a central position of government. That is to say, the Department of Administration, which handles the State's budget, should become a Department of Planning and Administration, as proposed in 1964 in the State's report, *Strategy for Development*. The great need for coordination (between highways and urban renewal, between water policy and industrial expansion, and so forth) would be the administrative prerogative of this central planning department, which in due course might emulate for the first time on our shores the extraordinary record of England and Sweden in rational economic planning as well. The State's planning goal should be a coordinated, non-political, highly professional effort. Decision-making for both the State's long and short-range goals would encompass social and biotic, economic and ecological, rational and emotional needs. Especially it would come to grips with a truism of our times: that change is the major factor

in life. As Sylvia Crowe has written, "The deterioration of environment, whether urban or rural, can invariably be traced to imbalance, over-specialization, and a lack of moderation."

"The Need for Landscape Planning," in *Towards a New Relationship of Man and Nature in Temperate Lands: Part II, Town and Country Planning Problems* (Morges, Switzerland, International Union for Conservation of Nature and Natural Resources: 1967), p. 15.

The Developmental Experiment Station

I suggest that the State seriously investigate a new idea of considerable pertinence to this magazine's readers. It is that of the "developmental experiment station." Since residential housing would appear to be the major usurper of open space, maybe even the major environmental catalyst for years to come, certainly some experimentation in landscape alterations should be undertaken. At this moment little experimentation in construction occurs in our country, except in the scattered instances of low-income, urban situations. The purposes of a developmental experiment station would be to enable the academic and design communities, in conjunction with both the private sector and governments at all levels, to test out new development plans and techniques for single-family and multi-family housing, second homes, shopping centers — the whole spectrum of siting, materials, labor, finances, planning ordinances. At last a design student might find his ideas brought off the drawing board and into reality, as exemplified in the most provocative manner recently in Montreal by the underwriting of the construction of Moshe Safdie's monumental "Habitat" at Expo '67 by Canada's Ministry of Housing.

Environmental and Basic Design Teaching in the Schools

Particularly at the elementary level, new programs in design and in conservation should be introduced in the North Carolina school system. Generally those regions with strong design or natural resources standards are those regions in which the rank and file of the population have a high degree of self-awareness of their surroundings. Often these peoples' self-awareness has accrued through their schooling.

In Scandinavia one finds today the greatest striving for beauty, order and contemporaneity in modern housing, urban development, and everyday design—whether of tableware or of street furniture. I am told this unique development has evolved from the rigorous design standards Scandinavian people have come to expect. Such standards have been fostered mainly by the design courses given to elementary school children, so that by now in a country like Denmark there are three generations of citizens who know

what color, form, line, or texture may mean and who demand a visual excellence in the physical, man-made civilization their nation is creating. (Compare this situation to America, where even a college graduate is a visual illiterate!) By bringing up the subject of design, I necessarily imply a striving for beauty. Beauty and conservation are closely related. As Paul B. Sears, professor emeritus of conservation at Yale, has said, "When I travel, I look for landscapes that are beautiful, because invariably, the beautiful landscape is also a healthy landscape." In a speech before annual meeting of Vermont Natural Resources Council, Killington Ski Basin, October 8, 1966.

Several American school systems have programs in conservation, natural history, environmental problems, or ecology. The better programs are related to the outdoors: in Vermont where new union high schools must include a 50-acre "outdoor laboratory;" in Ann Arbor, Michigan, where William Stapp has distinguished himself as a conservation educator; or in Montgomery and Prince George's Counties, Maryland where outdoor camps for elementary school children are now being established as part of the county school board's facilities. In North Carolina I know only of the Greensboro program, in which sixth grade students visit Umstead State Park (off the Raleigh-Durham highway) and for a week's period receive instruction from a faculty including North Carolina State University botany and zoology professors.

A year remains until the next session of the North Carolina legislature. The time to begin working towards the refinement and enactment of these suggestions is now. The various citizens' groups, conservation groups, and design professions should band together to raise funds and dispatch small study teams to visit on our shores and abroad the pertinent programs and accomplishments. Later these study teams should prepare reports, with accompanying legislation, to be brought during 1968 before the political candidates for endorsement and during 1969 into the legislative halls for enactment.

In this continuing educational quest of learning about man's true relationship to the earth about him, each of us should realize how little he actually may know. Those among us who may know something more have the duty of speaking out, while the rest of us have the duty of heeding their message. As a beginning, everyone might do better if he only heeded the belief of the Nigerian chief who said, "I conceive that the land belongs to a vast family of which many are dead, few are living, and countless numbers are still unborn." Quoted in Dasmann, Raymond F., *Conservation and Amelioration of Natural Environments (Rational Use of the Biosphere): A Report Prepared for UNESCO* (Washington, D. C., The Conservation Foundation: 1967), p. 70.

Will North Carolina copy the mistakes of other states which failed to create the fusion of city and country which makes for the good life in both?

One of the state's foremost planners pictures the ideal rural-urban community and programs its achievement.

A PROPER FUSION OF CITY AND COUNTRY in North Carolina and Selected Policies to create it

By
Pearson H. Stewart
Executive Director
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Planning Commission

Man to the moon! Computerized technology! Phone vision! Two hours to London! Washington to Boston at super speeds! With this type of science fiction future in prospect for the reasonably near future, what will our North Carolina cities and countryside be like in the next twenty to fifty years? What kind of futuristic Sunday supplement environment will we be living in?

I submit strongly that because of and despite the realism of our science fiction future, the North Carolina city and surrounding countryside will be a direct descendant of and have a very great resemblance to the present North Carolina city and surrounding countryside. The North Carolina city of the foreseeable future may or may not be of any better quality than our present city, but the future city will have a very similar form and pattern to those of the present city. Will we throw away our investment in the present urban area? Will we abandon our love affair with the individually operated vehicle? Will we lose our need for social contacts? Will the demands for individual and family privacy be less? Of course not!

For the next 20 to 50 years the future North Carolina urban area will be a logical and natural development from the present city. It can be desirable, attractive, efficient, profit-making, relaxing, delightful, human and obtainable.

Each of us is very apt to make use of pat phrases to describe general situations. Mine to describe the desirable physical form and character of the North Carolina urban area is the phrase used as part of the title for this article, "a proper fusion

of city and country." I include a great many urban and rural characteristics in this phrase:

- Compact, highly centralized urban central business districts providing the necessary face to face contacts for the very, very many aspects of the office and information industries.
- Commercial shopping areas properly located, designed, and maintained with pride of ownership.
- Industrial areas well located and developed provided with adequate power, water and waste disposal facilities.
- Highways, efficient and attractive for both the traveler and the business customer.
- Good agricultural land, protected and used as such.
- Woodlands encouraged and managed. Residences in rural areas well spaced on large parcels to maintain the country areas as country.
- Residences on smaller lots
 - located so as not to make life difficult for the farmer
 - arranged in clusters or groups to permit neighborliness and efficient municipal type services
 - provided with public water and sewer services where necessary
 - located in convenient relation to main highways
- Multi-unit housing well designed and conveniently located in relation to employment centers.

■ Open spaces in ample supply to secure urban-rural differentiation including:

- agricultural and forest land in private ownership
- land around residential developments kept undeveloped through the use of such areas as stream valleys, woodland strips, and areas difficult to build upon
- public areas used for recreation or conservation
- any other available or useful method like private camp areas, university botanical areas, campuses, historic areas, and others, each used and developed as appropriate
- Water bodies developed as appropriate for maximum usefulness, perhaps as a reservoir, a swamp, a free flowing stream.

I maintain that in North Carolina it is entirely feasible to develop urban areas—especially fast growing urban areas—with generous portions of countryside saved and maintained in, around, and through the urban development. For example, if Raleigh, in Wake County with the County's 859 square miles, expands in population to 500,000 and even if most of this number demands single family detached housing, all of these people can be provided for in a 190 square mile area, all within eight miles of the capitol building—and have within that area enough vacant land to provide for an additional 170,000 people. (Documentation is available on request.) The tremendous surplus of land guarantees the feasibility of a proper fusion of city and country.

Land and government policies to help ac

I recognize, of course, that the prime responsibility for achieving high-quality new development belongs to the *private builder, the private developer*. It is he who puts up the money and does much of the actual work of building the future. It is he who must build with pride of ownership, with pride of community, and with great respect for the land and for both the public and private interests in the land.

Residential Development

Subdivision regulations can be adopted and applied. These regulations establish standards for residential development. They can be written to encourage cluster-type residential developments that can be built economically, be serviced efficiently, and be surrounded by open land.

It is not unreasonably difficult to prepare appropriate subdivision regulations. They are not an unreasonable burden on the residential developer and, if drawn properly, can actually help the developer take advantage of modern and up-to-date design techniques that can save him money. A principal difficulty that faces a city or county in considering subdivision regulations is that of their administration. A competent person is required to receive and review plans for residential developments and to determine their conformance with the adopted principles or standards. This task must be done by a person having the respect of both the developers and the general public.

Water and Sewer Lines

We all know that good residential and industrial development requires good water and sewer services. We all know, also, that for residential areas served by wells and septic tanks a city is apt to have to come in during the course of annexation and install water and sewer lines, with the abutting property owners paying their share and thus paying twice for water and sewer service.

At present the principal water and sewer lines, the main lines that benefit more than an individual street, are provided within city limits by the city and outside city limits, on occasion to serve industry, by the county. Even though we know that the existence of water and sewer lines will attract residential development and will shape the physical form and character of urban areas, we have not yet

been able to install the principal water and sewer lines in areas of forthcoming development in advance of such development. These areas for the most part are outside of present municipal corporate limits and, consequently, it is difficult if not impossible for city government to provide the necessary water and sewer lines. In addition, the necessary water and sewer lines are the principal lines, those too big to be provided by an individual developer for an entire service area. The individual developer is usually limited to being able to provide only a short extension immediately adjacent to an existing line.

Is it possible for the principal water and sewer lines to be extended into areas where it is agreed that development will and should occur? Such extensions should not be in every direction all at once but should only be in those areas where it is publicly agreed development should occur. At-random extension would be very unprofitable for everyone.

Of course, the problem of financing such utility lines must be solved. Revenue bonds as a source of money would be an easy solution but one that is impossible since the revenues which will come from development are not present in advance of development to be a base for the revenue bonds.

Perhaps there is a politically feasible role that the state can plan in helping to provide major utility lines in areas of forthcoming development. I realize that this suggestion will require legislative action. **Would it be possible for the state to establish a revolving fund which cities could use to finance the extensions of major water mains and sewer outfalls outside of existing city limits?** The use of such a revolving fund would require that there be appropriate safeguards and cautions. Utility extensions financed with the help of a revolving fund should be in accordance with a plan for utility systems—which really means a plan for urban development—mutually adopted by the city and the state, probably by the State Board of Water and Air Resources. As a required element of the plan, there should be a statement of expected future population by appropriate time periods and an accompanying statement of where future population is to be located. The inclusion of these requirements for plan content would prevent improper and speculative extension of utility lines in all directions. They would compel also the municipality

to state publicly its thinking concerning the desirable location for future urban growth.

The use of the state revolving fund should also be predicated upon the city's contractual agreement to assess the cost of the line upon the benefitted property. Use of the assessment authority would guarantee to the state that the fund would be revolving, that the money advanced would be returned. Reliance upon water or sewer rates and tap-on charges would not guarantee to the state that the fund would revolve. Since the utility lines in this suggestion would be the major lines, not the lines serving individual houses and streets, the lines which properly are the responsibility of the individual developer, the assessment of the cost would of necessity be over a relatively large area, much larger than an immediately abutting narrow strip of land. Spreading the cost of the major utility line over a large area would result in an assessment which would not be confiscatory but at the same time would be a positive spur to development.

This suggestion of the use of a revolving fund does obviously involve the state government in municipal affairs. It would provide a tool with which the individual cities could take positive steps to shape their future development.

On-site Disposal

Like most everyone else I am aware of the generally unsatisfactory nature of the septic tank for use in urban areas. I hope that engineers and health people of all appropriate fields will get on with the job of developing an on-site domestic disposal system that will be both engineerly and publicly acceptable which will incorporate features of both aerobic treatment and reuse so that the problems of both quantity and quality of on-site sewage disposal can be solved satisfactorily. In making this request I realize that the development of such a satisfactory system will lend strength to the forces of urban decentralization. These forces are strong and good for some people. I do not consider them necessarily bad.

Agricultural and Other Private Open Land Protection by Assessment Practices

Currently there is considerable discussion concerning the desirability of assess-

achieve proper fusion of city and country

ing or taxing agricultural lands on some special basis so that these lands may be encouraged to remain in agricultural use. Such a practice could have considerable benefit and most certainly presents considerable problems.

In terms of benefits—there could be a built-in and guaranteed supply or stock of privately owned and used land which would have some assurance of remaining open. These lands could include both prime agricultural lands and also, and perhaps even more important for the urban dweller, the many stream valleys which must remain unbuilt-upon. It is to the advantage of the urbanite that not all land be built-upon but that there be variety in the urban landscape. Some of this essential variety can be provided by green land.

Land kept open because of an assessment policy is land which the local governments do not have to buy in order to keep open.

In terms of problems—how can land be classified uniformly so that only the lands which should be kept open for some positive reason receive the benefit of the lower assessment or tax rate? Land which should be developed should not receive any such benefit. Some method of relating the classification to a true agricultural zoning procedure or to some other form of officially adopted plan concerning the physical form and character of the urban area is necessary.

Is it possible to develop a workable system of collecting back taxes on a retroactive basis should land that is assessed or taxed at a lower value be sold at a higher urban development value? It is not right for an owner to pay taxes on some lower basis and also be able to sell at a higher value.

Any system of classifying land for a lower assessment must be one which will not include land which should become urban, land which should go into development more intensive than agriculture or forestry.

Farm groups are currently at work studying the problem of agricultural and forestry land taxation. It does seem reasonable to work with such groups to determine if the problems of agricultural land taxation can be worked out for the sake of the economic health and beauty of the urban areas.

Land Acquisition for Public Use

There are and will be many needs for land around North Carolina cities for public use. The need for public parks is an obvious example. The location and type of public parks ranges from day-use parks in the areas that will become developed in the near future of large-scale water-based parks along the shores of the forthcoming reservoirs.

Other public lands needed are school sites. All urban areas would be well situated if they could acquire school sites in advance of need. Not only would the school sites be cheaper if purchased in advance of need but also, and much more important, the very existence of the school sites in a known location would do much to channel and locate residential development in appropriate and desired locations.

Most cities in North Carolina either have finished or are in the final stages of completing major thoroughfare plans. These plans, of course, make provision for new highways in certain new rights-of-way. One of the prime difficulties in carrying out the provisions of a major thoroughfare plan developed for the future is that of acquiring the necessary rights-of-way. While all highways planned for the next 15 to 20 years are obviously not needed all at once, nevertheless the acquisition of the appropriate rights-of-way becomes more and more difficult as the years go on and as development in and around the desired location becomes more and more intense. It would be excellent if the rights-of-way for these future highways could be acquired early in the planning process, rather than at the last minute when acquisition is both costly and often productive of community controversy.

Some cities in North Carolina are making earnest efforts to protect future rights-of-way through advance purchase as opportunity or need occur: Winston-Salem and Greensboro are making especially earnest efforts. With North Carolina cities not having the prime responsibility for major highways and having, in addition, major financial difficulties, reliance on local actions for advance rights-of-way acquisition must be incomplete and partial. There is currently consideration by the Bureau of Public Roads to permit use of federal highway funds for advance acqui-

sition. This consideration should be encouraged and translated into policy.

Easements or locations for major water and sewer transmission lines should also be acquired well in advance of need—partly for economic reasons but also to utilize these forces appropriately in helping to shape the physical form and character of the urban areas.

I submit that it would be politically possible for the several urban counties to hold general obligation bond elections to provide money for the acquisition of appropriate public lands for public purposes. The passage of such a general obligation bond issue would require that there be a strong statement that the issue will provide all the public land necessary for X number of years and that the uses be spelled out. Parenthetically, making preparation for such an election would require the counties to come up with a well thought out and a realistically accepted plan for their future development.

Conclusion

These suggested policies concerning the desirable physical form and character of the urban area are most certainly not the only policies necessary to achieve the proper fusion of city and country. The policies discussed should be considered quite obviously in addition to other matters of public concern. In addition, because of space limitations, I have concentrated on those semi-rural and rural areas adjacent to existing population centers, the next areas where development is most likely to take place. I have made no mention of appropriate policies for presently developed areas, in particular the drastic revisions in conventional urban renewal policies that are urgently needed.

I submit that the urban development policies review in this article—if used in accordance with a sound plan for the city and country future of the urban area—can do much to secure a proper fusion of city and country and provide both an efficient and a delightful urban situation. I realize very well that my qualification “if used” is extremely important. These policies can only be put into effect by people and the people who are willing to work for these policies must run for office and must be elected. The proper policies are the responsibility of both politicians and the people.

The importance of nature as a scientific laboratory cannot be overestimated. The natural world contains answers to questions man has not yet learned to ask. The North Carolina Botanical Garden at Chapel Hill provides a regional habitat of great value to science, whose facilities are open to all qualified to use them.

THE NORTH CAROLINA BOTANICAL GARDEN

Photographs by F. E. Osborne

The North Carolina Botanical Garden was started officially in 1952 with 72 acres and today includes 329 acres of hardwood forest, mature stands of pine, fern covered slopes and open cultivated fields. The Garden is at the junction of the Coastal Plain and Piedmont near the center of the state at the western corner of the Research Triangle. Some of the lands, quite valuable as homesites but priceless as regards their botanical diversity, have been given to the state for Botanical Garden use by interested and generous citizens. Other areas of the Garden have been set aside for such special use from University lands by action of the Board of Trustees.

From its early conception to its actual organization and in current planning for the future, conservation has been the primary theme behind the development of the Garden. Over 30 years ago the late Dr. W. C. Coker, who developed the Coker Arboretum at Chapel Hill, saw the great need for the conservation of suitable natural areas for both research and teaching, and he began to assemble a research collection of native shrubs and trees, many of potential horticultural value for our area, on a portion of the "Mason Farm" property held by the University of North Carolina. At the same time Mr. William Lanier Hunt, a native of Greensboro then attending the University at Chapel Hill, was so impressed with the natural beauty and the botanical potential of the area just south of Chapel Hill that he determined to buy the more spectacular portions of this land in order to conserve it, as a gift to the people of North Carolina, for Botanical Garden use.

Modest experimental facilities were started in the Garden in 1960 and now, much expanded with research grant funds and private gifts, include two greenhouses, a lath house, numerous plant beds, tanks for research on aquatic plants and an 8-acre research lake. With student help under the Federal work-study program the first public trails were constructed during the summer of 1965 and opened in the spring of 1966. Additional nature trails were opened in 1967 which have provided a valuable teaching facility in addition to their recreational role.

The varied habitats found in the North Carolina Botanical Garden can mean more effective conservation. Often, to conserve a plant or animal species it is necessary first to conserve its habitat. Because of the unique combination of location and topography, habitats suitable to many of the nearly 3,000 flowering plants of North Carolina can be found, or realistically reconstructed, within this 329-acre tract. Of course, *every* environment cannot be duplicated in any one area of the state, thus it is proposed that the Garden acquire, primarily by gifts, small, ecologically significant tracts at various localities throughout North Carolina. These "Regional Habitat Tracts" would be held and maintained to conserve their special biological features for future reference, research and study, and would help assure that many of the rarer plants of our area would not face rapid and complete eradication through the increasing destruction of specialized habitats for other needs of our expanding population. Despite the pressing nature of our needs for space for

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Botanical Garden

our growing cities, highways and factories, it is an extremely dangerous and short-sighted economy to allow a plant species to become extinct before its scientific, economic and cultural value is known.

To insure the most efficient use and effective development of the scientific potential of the North Carolina Botanical Garden, the Garden facilities are open to all who are qualified to use them. Currently over twenty research projects in various aspects of Botany Zoology, and Environmental Science are making use of the expanding research facilities. Thus, the Botanical Garden functions as an outdoor laboratory where many experiments involving plants and our environment receive the critical test—reaction under natural conditions. To appreciate the importance of such a test it is well to note that the ultimate significance of most discoveries in biology lies not in the reaction of an extract in a test tube or the behavior of an animal in the laboratory but in a functioning organism in its natural environment. The more different kinds of habitats, or environments, available to the research scientist the more varied and useful can be his experiments and observations.

The primary role of a Botanical Garden is thus the same today as it was five centuries ago: to furnish specific living plants, plant materials and botanical knowledge to all those who have a need for them. In the Middle Ages the first Botanical Gardens, then known as Herb Gardens or Physic Gardens were collections of medicinal plants used by the physician-botanists as the source of materials



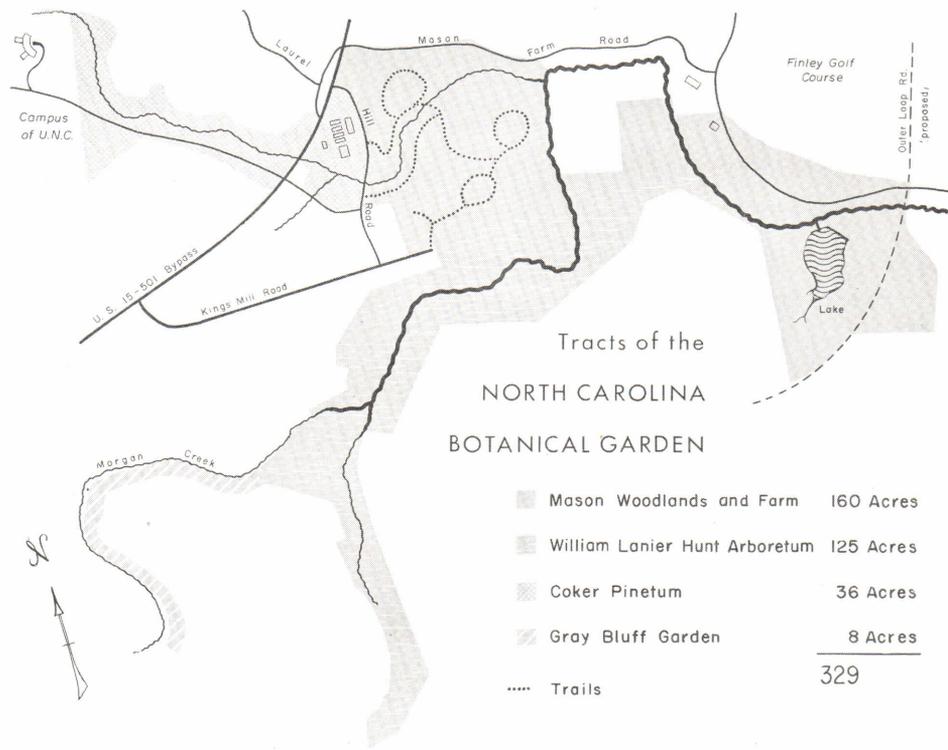
Campsis radicans
Trempeet creeper or Cow-itch



Rudbeckia serotina
Black-eyed susans



Rhododendron calendulaceum
Flame azalea



for the drugs, tinctures and potions prescribed for their patients. In the 17th and 18th centuries, during the great age of world exploration and discovery, the Botanical Gardens of Europe served as centers for the scientific study of the many new plants brought back from distant shores by each returning expedition. In this role Botanical Gardens served in part as Experiment Stations in the development of many new crops for domestic and colonial production. Rubber plants and plants of coffee, tea, cocoa, vanilla, Irish potato and breadfruit were a few of the plants, studied in Botanical Gardens, that literally helped change the course of history.

The scientific aspect of Botanical Gardens has meant, historically, that they are usually associated with a university or other center of higher education, and it is the scientific work that separates, by definition, a Botanical Garden from a purely horticultural garden designed primarily for beauty. However, beauty and scientific work need not be mutually exclusive and the past century has seen a strong and highly successful development of the many cultural aspects of Botanical Gardens. Their land areas provide a community with "open space" or "green areas"

and their resources can often be used to advantage in public programs in both education and recreation. Some Gardens, with strong civic backing, are now local centers for numerous other cultural activities such as plays, art exhibits and lectures.

Today, unchanged by the technological advances that make possible bigger harvests with fewer man-hours, man's basic dependence on plants for all of the food we eat and the oxygen we breathe remains as important as ever. Despite the technical advances in medicine and chemistry the hundreds of thousands of different chemical compounds synthesized by plants are still one of our most realistic and potent reservoirs of new drugs. Most of these compounds have yet to be tested, much less identified and synthesized. Of the estimated 410,000 species of plants in the entire plant kingdom only 10 species account for 70% of man's total carbohydrate food energy. Probably less than 500 additional species of plants currently serve most of our other botanical needs for fuel, shelter, clothing, drugs, drink and spices. As the world's population increases and as man's needs for plant products become more acute, many of these needs will doubtless be met by some of the remain-

ing 409,000 plant species. The work of the world's Botanical Gardens in continuing to help collect, grow and study plants for man's use will play a large part in this universal program for survival. To this function we can add the important but often intangible cultural values to be derived from a "living museum" that will conserve and display for all a segment of the natural beauty to be found in our varied environments and their associated plant species.

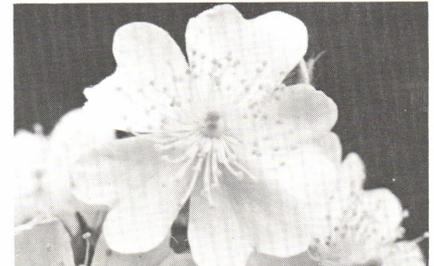
The valuable land for the Garden has cost the state nothing and the initial work on the public areas has been done primarily with modest private and federal funds. Any further significant development of the public programs of the Garden must await the necessary state support that has been requested. However, to help assist the Garden development and service programs a private, non-profit, Botanical Garden Foundation was incorporated, in 1966, which can hold lands and receive funds and endowments for the use of the Garden. It is also through the Foundation that additional unique habitat tracts throughout our area may be preserved and made a part of the Garden's total program of conservation, education, and recreation.



Oenothera biennis
Evening primrose



Chrysogonum virginianum
Green and gold



Rosa multiflora
Multiflora rose

THE 1967 NORTH CAROLINA LEGISLATIVE RECORD

By
Milton S. Heath, Jr.
Associate Director
Institute of Government
University of North Carolina

The 1967 General Assembly will be long remembered by conservationists for its extraordinary output of water resources legislation and for the initiation of a new air pollution control program. A potent combination of conservationists and public health advocates contributed significantly to the successful drive for new water and air laws this year, and made its weight felt in shaping the content of these laws.

Outside of water and air resources, the 1967 conservation law record was rather routine. However, some important beginnings were made toward securing effective legislative control over strip-mining in North Carolina. Also, there were some noteworthy revenue developments affecting fish and wildlife programs, including (for the first time) a legislative allocation of gasoline tax revenues to the Wildlife Resources Fund.

In the waning weeks of this legislative session, the General Assembly assigned to

study groups several investigations that promise to keep conservation programs in the legislative limelight in 1969. These include a continuing study of water law needs (delegated to the Legislative Research Commission) and separate study commissions on public parks and forests, and on the organization of the State's conservation and development programs. The latter study, in particular, has long-range implications of considerable moment for conservation activities in North Carolina.

Water and Air Resources

Two landmark water laws were enacted by the 1967 General Assembly, one concerning the regulation of water use in "capacity use areas" and the other concerning organization of state water and air programs. This year also saw the enactment of a large volume of related legislation concerning dams, wells, watersheds,

marshlands, flood-plains, and local water and sewer utilities.

Very briefly summarized, the principal new water laws put on the statute books this year were:

Air and Water Board Reorganization

This act brought about the merger of the old Board of Water Resources and the Stream Sanitation Committee into a unified Board of Water and Air Resources, adding air pollution control to the jurisdiction of the new board and to the staff functions of the new Department. (The air pollution control authority is the first legislation on this subject in North Carolina, and is patterned after the State Stream Sanitation Law.) The act also introduced some important procedural reforms, including addition of streamlined procedures for air and water pollution emergencies; doubling of maximum and minimum

fines for pollution violations; and granting to the department the power to seek injunctions to restrain pollution violations.

Capacity-Use-Areas: This act gives the new department limited authority to regulate the use of water in areas where it finds that water shortages or conflicts exist or are impending. The kinds of controls that may be imposed include protections against salt water encroachment and against unreasonable interferences with other water users; well spacing and well pumping limits; and provisions on timing of water withdrawals. In capacity-use-areas, permits containing these controls may be required of all users of over 100,000 gpd. This is the first regulatory authority over water use to be adopted in North Carolina, other than an unworkable irrigation permit law that was passed in 1953 and repealed in 1961.

Well Construction Standards: Under this act the department can adopt rules concerning well location, construction, repair and abandonment, and can require permits for wells of 100,000 gpd design capacity or larger. The act also lays down some specific requirements on well construction and maintenance, and prohibits injection of wastes into the ground through wells without approval of the Water and Air Board after consultation with the State Board of Health.

Dam Safety: This act authorizes a program of inspection and certification of dams for public safety and stream flow-maintenance, with exemptions for small dams.

Watershed Amendments: Some major changes were made this year in the enabling legislation for "small watershed" programs (water conservation and flood protection projects assisted primarily by the Soil Conservation Service under Public Law 566). Among other things, these changes broadened the authority of cities and counties to finance such projects; enacted general condemnation powers for watershed programs; and authorized local sponsors to include recreational features in their projects and to promote fish and wildlife habitat preservation.

Marshland Dredging: An effort was made this year to obtain strong controls over dredging and earth moving projects in state-owned marshlands, beaches and tidelands. The compromise bill that was enacted, however, was limited to a registration measure for earth moving equipment in these areas.

Miscellaneous: Other significant new water laws adopted this year include statutes authorizing a program of flood plains management; authorizing

conditional assurances by the Water and Air Board for non-federal cooperation in water supply aspects of federal reservoir projects (an essential prerequisite for building water supply storage into federal flood control projects); authorizing a water use reporting system for the Department; and strengthening the statute that requires well drillers to furnish samples of well cuttings to the Department.

Water Laws

The immediate stimulus for this outpouring of water legislation was a Department of Water Resources study of the need for water-use legislation, directed by the 1965 General Assembly. Though sparked by the growing ground-water problems of the phosphate mining areas in and around Beaufort County, this study covered the entire range of water resource programs and laws.

The more fundamental origins of the 1967 water laws can be traced to a decade of patient planning and study by state water agencies.

Twelve years ago a mildly revolutionary proposal, born of the extended drought of the early 1950's, was offered to the 1955 General Assembly: To replace the traditional riparian rights doctrine that has perennially guided the use of Carolina surface waters with the rule of prior appropriation, modeled on the principles that govern water use in the arid western states. Strong backing from agricultural and municipal interests met with stronger resistance from industrial water users, and the proposal was rejected in favor of a compromise solution, involving the creation of a water-policy study group (the State Board of Water Commissioners) with limited authority to control water use in local water-supply emergencies. During the late 1950's the water commissioners led by General James Townsend, an early backer of water-law reform, studied and ruminated. In 1959 the old Board was transformed into a new one, the State Board of Water Resources, originally conceived as a single coordinating board for all state water programs to be staffed by a single Water Resources Department. A nominally single Department was created by the 1959 Assembly; but instead of fashioning a unitary water board, the 1959 legislation created one Department with two policy heads: the State Board of Water Resources, to carry forward the water-use policy and development functions of the old water board, and the Stream Sanitation Committee, to continue as master of the State's water pollution control program. General Townsend moved over from the old board to head the new Board of Water Resources, while former Senator J. Vivian Whitfield, the father of the Stream Sanitation Law, stayed on as head of the Stream Sanitation Committee. Through the early 1960's the fledgling Department

slowly gathered its forces, strengthening and expanding the stream sanitation program, building a ground-water staff, and initiating a planning program.

From this long and slow evolution finally emerged in 1967 the first substantial policy output of a decade of study and appraisal — legislation unifying the direction of the Water Resources Department under a single board and separate acts granting additional powers to the Department, including the authority to regulate water use in "capacity water use areas."

The combination of the water and air board reorganization and the capacity-use-areas law gives North Carolina the statutory basis for a unified program of coordination and control of both water quality and quantity that is matched by few if any eastern states. Soon after enactment of these laws, the retirement of General Townsend from the former Board of Water Resources and the appointment of Senator Whitfield as Chairman of the new Board of Water and Air Resources were announced. The new laws serve as both a fitting tribute to General Townsend upon his retirement and a solid starting point for Senator Whitfield in his new assignment.

Worthy of special mention was the unusually vigorous role played in the formulation of these bills by legislative committees, notably in the Senate handling of the capacity-use-areas and well-construction-standards bills and the House handling of the reorganization bill. Major contributions were made to the form, content, and public understanding of these bills by the legislative subcommittees and committees, going far beyond the usual experience in these regards. Individual legislators who were prominent in the drive for these new laws, especially in the crucial committee and subcommittee work, included Rep. Norwood Bryan of Cumberland County, Rep. (now Judge) James Exum of Guilford, and Sen. John Burney of New Hanover.

Mining

During last April, May and June public controversy simmered over the Texas Gulf Sulphur Company's prospecting for minerals in and around Orange County. Since strip-mining appeared to be the only economically feasible process for mining in this area, opponents of the TGS plans focused on the need for stronger regulation of strip-mining processes. North Carolina had no strip-mining controls on the statute books, and indeed still has none.

Very late in the legislative session — necessarily late because of the timing of the controversy — Rep. Bryan introduced a strong strip-mining control and reclamation bill, modeled on the laws of states such as Kentucky, Illinois, Indiana and West Virginia, which have already tangled with this problem. Little was expected of this late-blooming proposal, and it came

as no surprise that the bill died in House committee. It was given a genuine hearing, however, which brought to light some of the special problems of various segments of the N. C. mining industry, problems that necessarily must be met and evaluated before any new legislation is likely to be enacted. The 1969 General Assembly will probably see a renewal of this effort to secure effective and workable strip-mining controls. If adequate legislation is enacted then, North Carolina will secure a head start on a problem that in other mining states has usually prompted legislation too little and too late.

Although the Bryan bill failed to pass this Legislature, two tangible actions were spurred by the Orange County controversy.

One was the adoption of rather stringent provisions concerning strip-mining in the Orange County Zoning ordinance. Though not yet applicable throughout that County, nor emulated yet elsewhere in the state, the success of this effort in Orange is a hopeful sign for conservationists. The other tangible step was legislative adoption of the interstate mining compact, which encourages signatory states toward educational and cooperative efforts in response to surface mining developments. While the compact offers no direct remedies, it does reflect legislative awareness of the problems of strip-mining and may provide a framework for future action.

State Lands

Two new laws concerning the beds of ocean and navigable waters were put on the statute books this year. One asserts state title to bottoms of navigable waters within one league of the seashore, and to shipwrecks and artifacts over ten years old in navigable waters. It also requires that permits be obtained for exploration of shipwrecks from the Department of Archives and History. Another new law revised the statute providing for leases of state-owned bottoms for oyster and clam cultivation.

Highway Beautification

Years of efforts by garden club leaders, planners and other beautification advocates finally flowered this year in the enactment of important new highway beautification legislation. Two new laws will regulate billboards and junkyards along interstate and primary highways. (Under these laws it will be unlawful to maintain outdoor advertising within 660 feet of the right-of-way, or junkyards within 1,000 feet of the right-of-way, which are visible from the main travelled way. Certain exceptions are spelled out, as well as procedures permitting state acquisition of nonconforming existing properties.) A third 1967 law authorizes acquisition of scenic easements by the State Highway Commission along state highways. A fourth act allows sale of personalized auto

license plates at a premium price, with one-half the net proceeds to be used for highway beautification work.

Fish, Game and Boating

1967 was not a "banner year" for fish, game and boat legislation — by contrast, for example, with 1965 which saw an omnibus revision of the commercial fisheries law that was one of the major enactments of that session. However, this legislature did bring the usual volume of minor changes and some developments of more than routine interest, which are noted here.

Legal protection was extended this year to several classes of animals, birds, and reptiles — including porpoises; bears, out of season; sea turtles and related species; and great horned owls, Cooper's hawks and sharp-shinned hawks. Some limited safeguards were provided for wild game or birds held in captivity.

There was some interesting revenue developments. Most significantly, for the first time a legislative allocation was made this year to the Wildlife Resources Fund from the motor fuels (gasoline) tax. The amount was small, one-eighth of one per cent of net proceeds, and the allocation was specifically limited to the 1967-69 biennium. In the long run, however, the recognition in principle of the contribution of motor boat owners to gasoline tax revenues may prove more important than the limited nature of the 1967 legislation.

In other fiscal developments, the non-resident hunting license fee was raised by \$2.00 for the benefit of migratory water fowl programs; a self-assessment plan was authorized for possible use by the coastal fisheries industry, at a level not exceeding one per cent of average commodity values; and the sales tax on boats was reduced from 3 per cent to 1½ per cent, thus placing boats on a par with automobiles and other vehicles under the sales tax.

There were some notable failures this year among proposals for fish, game and boat legislation, especially in the area of water safety. Among the defeated items was a bill to create a permanent Water Safety Committee and to provide in detail for local water safety regulation coordinated by the committee. Other bills failing to pass included a motor boat operator's license measure, and bills concerning the diver's flag and water ski towing.

A proposed revision of the "trash fish" law likewise failed to pass, as did a trout-water impoundments bill. The former would have tightened restrictions on taking of undersized food fish by commercial fishermen. The latter would have established design criteria for inland impoundments on streams supporting a natural trout population.

Study Commission

This General Assembly called for a total of 25 interim studies to be made by

study commissions or state agencies, and reported to the 1969 Assembly. At least five of these projects are of special interest to conservationists.

One study resolution has already produced some results — a C and D Departmental study of the suitability of Pilot Mountain for inclusion in the State Parks system. The C and D Board has voted to direct that preliminary steps be taken looking toward the eventual inclusion of Pilot Mountain in the parks system. Another related study will involve an inventory and evaluation of public park and public forest facilities in North Carolina, to be made by a 15-member State Parks and State Forests Study Commission.

In the wake of this year's flood of new water laws, the Legislative Research Commission was directed to evaluate the new laws, the need for amendments, the need for re-codification of water resources legislation, and the need for a special master or hearing officer procedure in the new Department of Water and Air Resources.

Does North Carolina need a public zoo? This question was left to be explored by the Zoological Garden Study Commission, a nine-member study commission which will report back to the 1967 Assembly.

The most far-reaching of these study assignments was given to a nine-member Conservation and Development Study Commission. Its task will be to consider whether the old-line Department of Conservation and Development should be split into two departments, one concerned with natural resources and the other with commerce and industrial development. A counter-proposal has since been made by Governor Moore, for a three-way split, the third agency to be concerned with tourism promotion. Other variations that this study commission is authorized to consider under its mandate include linking some or all of the State's water, fish and game, recreational, and environmental agencies together with the present conservation components. Lt. Governor Scott, who initiated the study commission idea, has not yet voiced any specific recommendations.

There is a tendency to disparage the study device as a way to bury governmental problems. In North Carolina, however, the actual record of the interim legislative study commission in originating significant legislation is surprisingly strong, compensating partly for deficiencies in professional staffing of the Assembly and its standing committees. Indeed, the astute innovator in government recognizes in the study commission what is often the shortest distance to governmental reform in North Carolina. Judging by past performance, therefore, there is a fair prospect that the interim 1967-69 studies on conservation will leave some perceptible marks on the conservation landscape.

BEAUTY IN NORTH CAROLINA · A PUBLIC & PRIVATE CONCERN

By

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"North Carolina is where the government and private citizens strive to preserve what has always been; thus, assuring that the face of the region will remain unmarred." If this statement, from an attractive booklet, *North Carolina, The Goodliest Land Under the Cope of Heaven*, published by the Department of Conservation and Development, is to remain true, it will take the combined efforts of the state and its private citizens to make it so. The description of North Carolina as the "goodliest land under the cope of heaven", the booklet tells us, was made by sixteenth century visitors to these shores. Now, in the twentieth century, many of our "goodliest" areas of natural beauty, our natural water resources and our well-balanced ecological climates are in great danger.

In the past, the success and progress of our nation has been based, to a great degree, on the way natural resources have been used. In many instances, man derived benefits from nature in such a way that natural balances were little disturbed. Man learned from nature and gave back to nature. Early settlers often made roads by driving an animal in front of them and

following the path the animal made along the contours of the land, selecting, by instinct, the path of least resistance. This path turned into a road which joined the landscape, but did not intrude upon it, one which would not wash or erode because of its natural design. However, often our natural resources were used up instead of being used.

In the fight to save the Grand Canyon from destruction, it was brought out that this country, 'America the Beautiful', in the relatively few short years of its existence has used up 90% of its wild country. Fortunately, there are some dedicated citizens and officials, like those fighting for the Grand Canyon, who will strive to save the little bit that is left — a paltry 10%. Man must, in the 20th century, achieve the forbearance and maturity to leave some of the earth alone.

North Carolina still has some interesting, natural, unspoiled countryside left, but it is going fast. The Great Smokies National Park, The Blue Ridge Parkway, The National Seashores and Forests, the State Parks, represent fairly large holdings in the hands of government. However, within these holdings, the num-

ber of wild, natural, scenic areas which are left undeveloped can be counted on one hand.

There are in this state a number of citizens, who, often with personal sacrifice, have acquired and held tracts of land because they wanted to save it from the deteriorating elements in our environment. These few fragments of land are cherished and nurtured as essential to the inner being, and the physical and mental health of the owners. There is a satisfaction in owning and holding property which has intrinsic natural values. The preservation of aesthetic values and natural beauty should be a strong part of our national life.

It is now possible for people not to have to choose between living in the city or enjoying the country. They can have both on a modest scale. The more people who desert the farms for the city, the more land and buildings they leave behind for the city dwellers who long for the vistas, the solitude and the clean, natural environment still found in the countryside. Man first built cities to gather people together for safety. Now the



BLOWING ROCK



BILTMORE FARMS

Photographs courtesy Travel Information Division
Department of Conservation & Development
North Carolina

countryside is safer than the cities, and has less of the smog, smells, noises, and soiled environment of the city. The city uses men up — the country renews them — The country is a necessary environment for certain kinds of creative thinking. It fortifies man for the time he must spend in the city.

This is a positive-type of recreation — enjoying and studying the wild flowers, forests, animal life and scenic qualities of the land.

The healthy, biologically balanced environment encouraged by this enlightened ownership is a great service to conservation in the state. Soil and wind erosion are checked, soil fertility is maintained. The aesthetic aspects of the countryside are preserved for those who feel the need to get into the landscape on two legs, instead of four wheels, and become intimately a part of it rather than merely experiencing it by opening the car door in front of a picnic table and trash can or a concrete slab laid down for a tent or trailer. There are those who wish to travel on old roads which meander pleasantly through the landscape instead of new ones which often rip the guts out of the landscapes they traverse.

As our population increases, the cutting, draining, filling, slashing and bulldozing of our environment continues, often unnecessarily. Developers today have the means to change and destroy nature drastically and quickly. The protection and preservation of our natural resources by both public and private means becomes important. Some of our most beautiful, most wholesome, and beneficial areas are privately held by citizens who have saved them from destruction, and who are dedicated to continuing this tradition of conservation. The pursuit of happiness and the right to own property are among the basic tenets of freedom. There are individuals who love the land and take care of it.

In Great Britain and other European countries the high density of population and the shortage of land requires that parks be planned in such a way that recreation, production, private ownership, and public ownership all occur in the park areas without causing hindrance to each other, or intruding upon each other. These various properties intermesh — each gaining from the protection and encouragement afforded by the others. This plan allows people to live in the area all year round. Each property succeeds in retaining its scenic character, and provides delight for those who come into the park.

Careful planning has brought this about. By this means maximum use is gotten from the land, and, at the same time the natural resources and beauty, which are limited and irreplaceable, are carefully preserved.

Senate bill 666 passed by the North Carolina legislature in the 1967 session authorized the establishment of a Study

Commission to inventory and appraise the forest and park facilities of the state, both public and private in relation to our present needs and the projected needs of the citizens. This bill states that "there exists a need for improved coordination between Federal, State, local and private efforts to provide for the future recreational needs of the state." The passage of this bill is a giant step forward, now, we need to continue to move forward from this beginning before it is too late.

In this country there is a tendency for governmental agencies to view all private owners as a threat. It is also true that, in some places, groups of people are so anti-government, that they had rather move out than cooperate with any type of governmental control. The stereotype of a private owner is often that of a private developer who is out for material gain, who threatens to destroy scenic, scientific, and historic sources — one who eyes areas under consideration for potential recreational use as potential financial bonanzas. Persons of this caliber do exist and they need a redirection of purpose or tight control.

On the other hand, sometimes conservation-minded owners may in turn view governmental ownership with skepticism because the political climate can change, and governmental development can destroy aesthetic qualities and permit a type of recreation to come about which does nothing to preserve our natural possessions. Responsibility can be reduced to the lowest common denominator of mass standardization. Nature cannot be standardized!

Outdoor recreation is more often a private, personal venture which should be encouraged. In North Carolina we have great possessions that will cost us little to keep but much to lose.

In striving for a positive program, public and private ownership can be compatible. Consultation services and other means exist for working out the preservation of areas with recreational potential. Many of our recreational lands do not get maximum use because they are open only during certain seasons of the year.

In-depth studies must be made of the problems facing us. For example, the establishment of two more artificial lakes in North Carolina is extolled by saying that these areas in question now have everything desirable for recreation except water (meaning, of course, the water to be impounded). This is not true. There is a great danger that the areas in question may not have *any* water in the end because of the proposed lakes. Now, in their natural states, these areas have scenery and water resources which are of great recreational value for those with the imagination to enjoy the fun. The water flows through in swift, clear rivers—a challenge to the canoer or swimmer. It sparkles in the streams for fishermen and swimmers, drops over rocks and stone for-

mations to make water-falls — delightful to sit near on a hot summer day. It is there in wells and springs of unpolluted water. It is not forced into one single place, but it is distributed by nature to become a vital force in creating a balanced ecology and a clean environment. This system of checks and balances will be disturbed by the impounding of the water and the periodic use of good North Carolina water, not for our benefit, but to profit our neighbors to the south and to the north. These proposed lakes will be used as flush tanks for flushing out the pollution allowed to accumulate elsewhere, outside our boundaries. The rivers will become silt-traps, the wells and springs will dry up, the streams will be reduced to trickles as the water table falls. The initial impoundment of the water will drown geological treasures, botanical treasures, and treasures of human history. Periodically the lakes will become mud holes, as the water levels fall, unfit for recreational purposes or for any other purposes including human habitation. Marine life will perish.

The placement of large artificial bodies of water must be carefully studied. Lakes already here and those proposed should come under a long range appraisal. Often the hoped for benefits of proposed projects do not exist and long-range effects are disastrous and irreversible. The initiative in the use of natural resources today lies not so much in the promotion of expensive projects but in avoiding costly mistakes.

We must save the resources of the state for the benefit of the citizens — not sacrifice our gifts of beauty and our wonderland of natural variety to outsiders who have become too concerned with profit making to have the vision and foresight to anticipate the problems spawned by their unwise destruction of natural resources.

Some way must be found to keep large industrial monopolies from needlessly scarring our lands and marring our beauty to provide profits for their clients, often out of state. Occasionally a token gesture of reparation is made but the damage continues. Industry should put back into the landscape as much as it takes out.

Our major problems can be solved if everyone works together for an improved environment. Industry, government, private citizens, interested in a better life for all, should strive for a good natural resources management program — the value of which is beyond the measure of money. Other examples of problems facing us, involving geological formations, forest complexes, marshlands, chemical damage, could be sited if we are to preserve what has always been.

Man can better his social relationships, his soul, his mind, his humanitarian outlook if he is able to escape, occasionally to some of the still existing places of solitude any of which may be described as a "goodly spot under the cope of heaven."

CONTRIBUTORS TO THE CONSERVATION SECTION



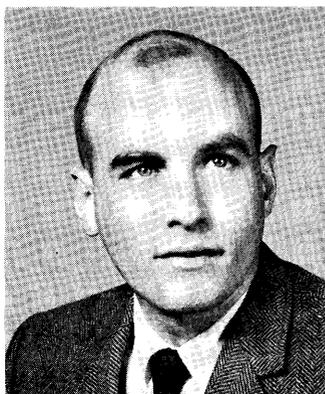
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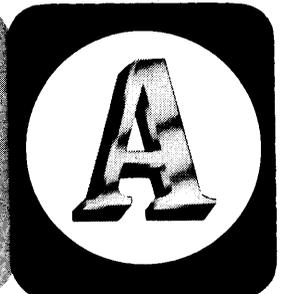
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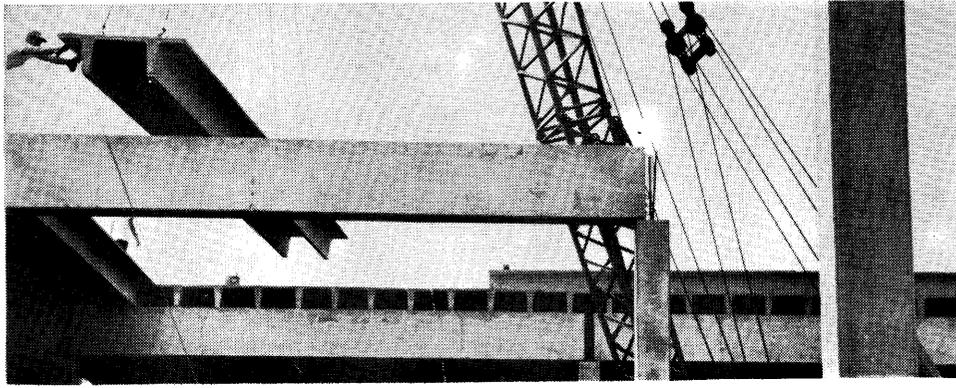
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Architect-Engineer: Fenton G. Keyes Associates, Providence, R. I.; General Contractor: E. Turgeon Construction Co., Providence, R. I.; P/S P/C Fabricator: New England Concrete Pipe Corp., Newton, Mass.

In just seven months, 4,500 prestressed concrete columns, girders and beams (they would stretch 32 miles if laid end to end) were produced and assembled to fully enclose the Brown & Sharpe Manufacturing Company plant in North Kingstown, Rhode Island.

With 660,000 square feet of plant space, plus attached two-story office building, this is the world's largest single story prestressed concrete structure built for industrial use.

A master plan for company growth indicated a need for future expansion in virtually every direction, and for rapid change-over of production flow in event of national emer-

gency. The prestressed column, girder and tee-beam system with lightweight foamed concrete slabs forming the exterior walls readily meets these requirements, yet provides an attractive appearance in a rustic setting.

Maintenance, climate control, insurance rates, fire protection and many other factors indicated that concrete unquestionably offered the most economical structural system in terms of the overall life-span of the building.

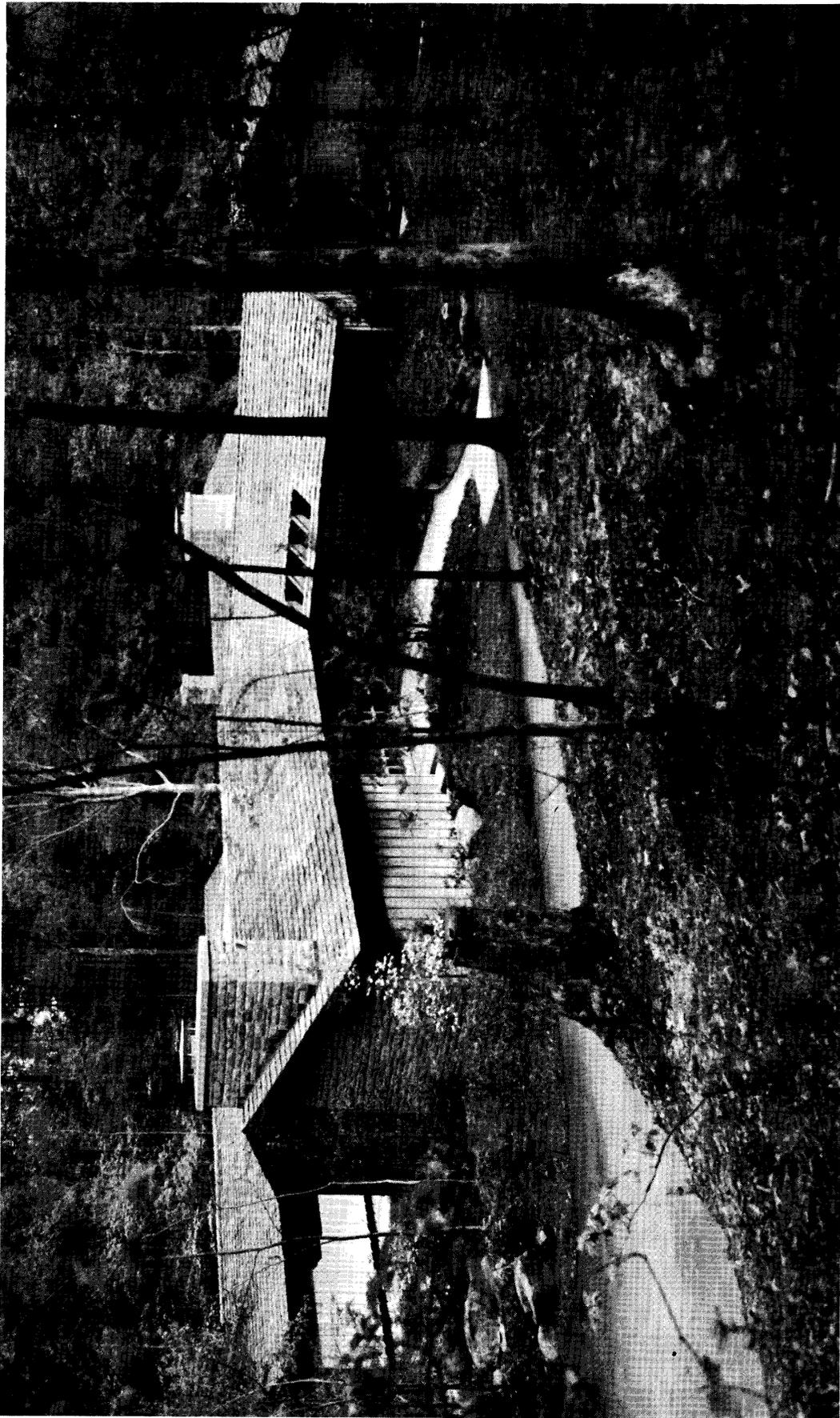
Design flexibility and economy are just two of the many reasons why prestressed concrete is today's answer for industrial buildings.



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This house reminds us that a gently sloping roof with eaves provides the simplest means of shedding rain, protecting walls, windows and foundations from the roof's run-off, screening the openings from the sun, extending protection to the outsider as well as to the insider—and looking like the effective shield it is against all that attacks from overhead. In this view, a ground-cover of pine needles continues the naturalness of the landscape into areas that have been cleared of trees and undergrowth in the process of constructing the building.

Photographer: Taylor B. Lewis, Jr.

**A BOARD AND BATTEN HOUSE, BRIDGING A SMALL STREAM IN
NORTH RALEIGH, BY MacMILLAN & MacMILLAN, ARCHITECTS,
FAYETTEVILLE, NORTH CAROLINA.**

Bridging the ravine recognizes the continuity of the landscape. By occasionally leaving the earth and exposing parts of its underside, the house appears to rest lightly on the earth, neither pushed into it nor pushed out of it. To the little bridge in the foreground, spanning the stream is its main purpose in life; to the building behind it, spanning the stream is an incident only.

Photographer: Lewis P. Watson

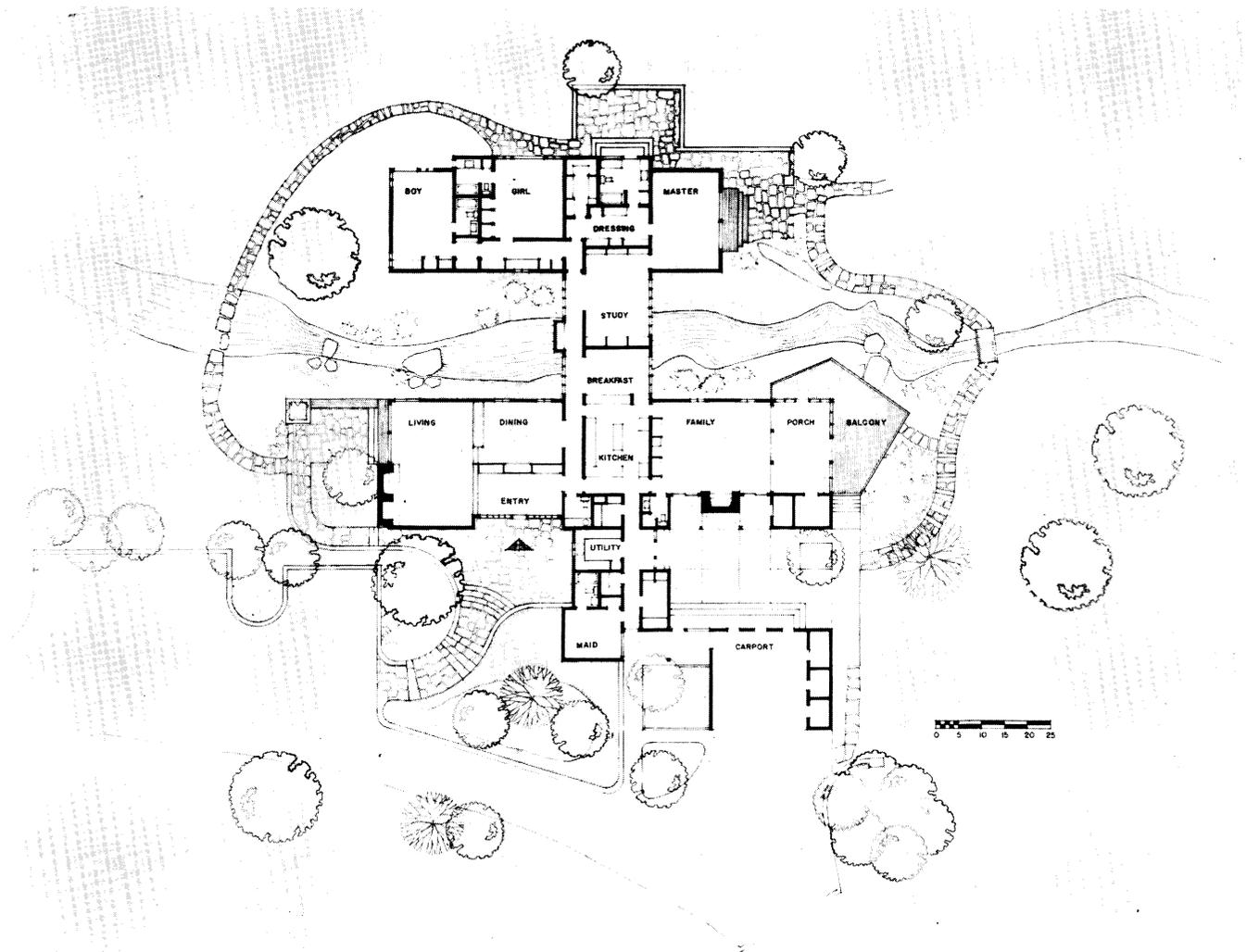


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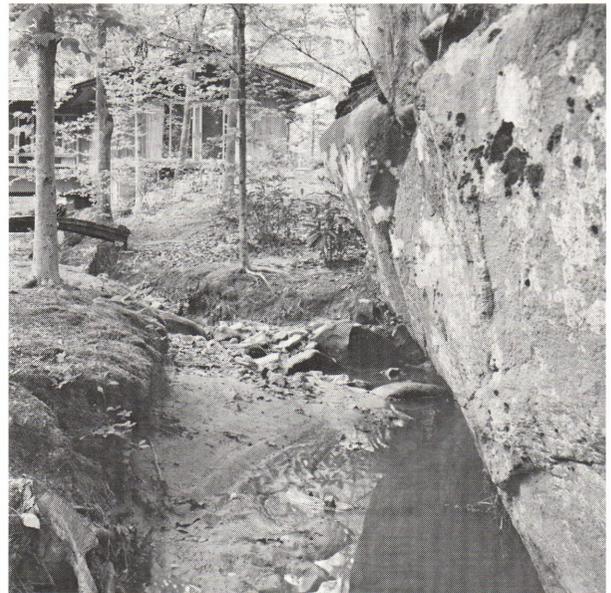
Photographer: Lewis P. Watson





First we enclose and next we open. Sometimes we open wide to sun and view; other times but slightly, as here, to tantalize ourselves with bits of sky and grass.

Photographer: Lewis P. Watson



Simple forms and quiet colors mark both landscape and building. Colors of the building take advantage of the colors of the rocks, trees, grass and fallen leaves to link themselves with them, borrowing strength from the landscape's vaster store of color.

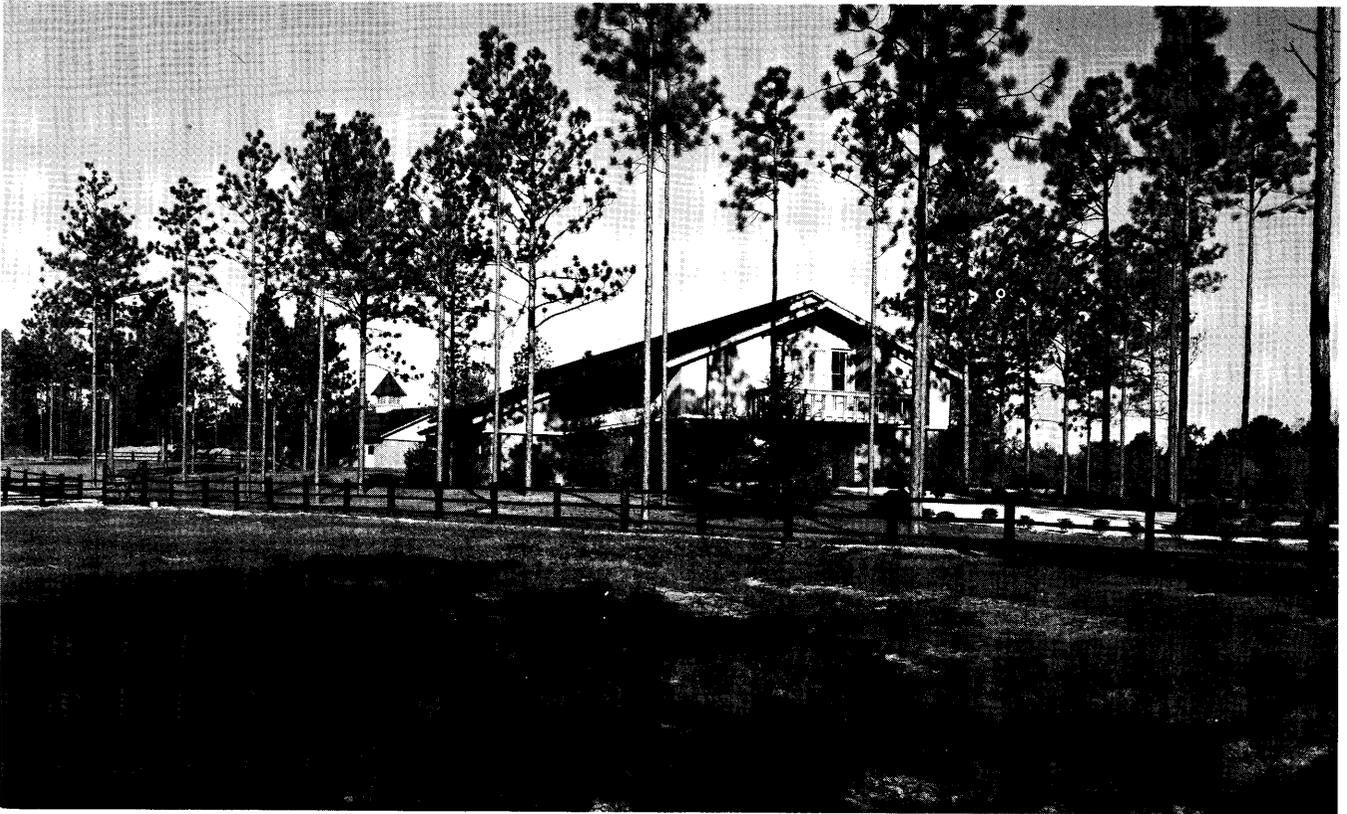
Photographer: Taylor B. Lewis, Jr.



The horizontal lines of the building are seen through a screen of vertical tree trunks. The elevated porch extends the inside floor to the outside just as the eaves extend the inside ceiling to the outside—an invitation to the outsider to accept both a floor under his feet and an umbrella over his head.

Photographer: Lewis P. Watson

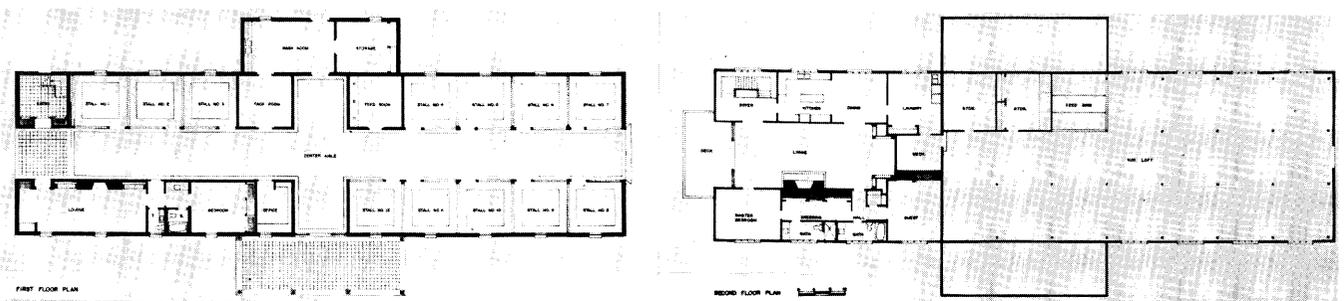
A BARN WITH A HOUSE IN IT



It is customary to remark on how much better looking are barns than houses. Perhaps this is what led the client to ask for a barn with a house in it. Our only regret is that it gave the architects no chance to demonstrate how good they are at houses, too.

Large and simple are words to describe this building and also to tell us why the building looks so comfortable on its open, level site, surrounded by tall, straight pines.

Photographer: Joseph W. Molitor

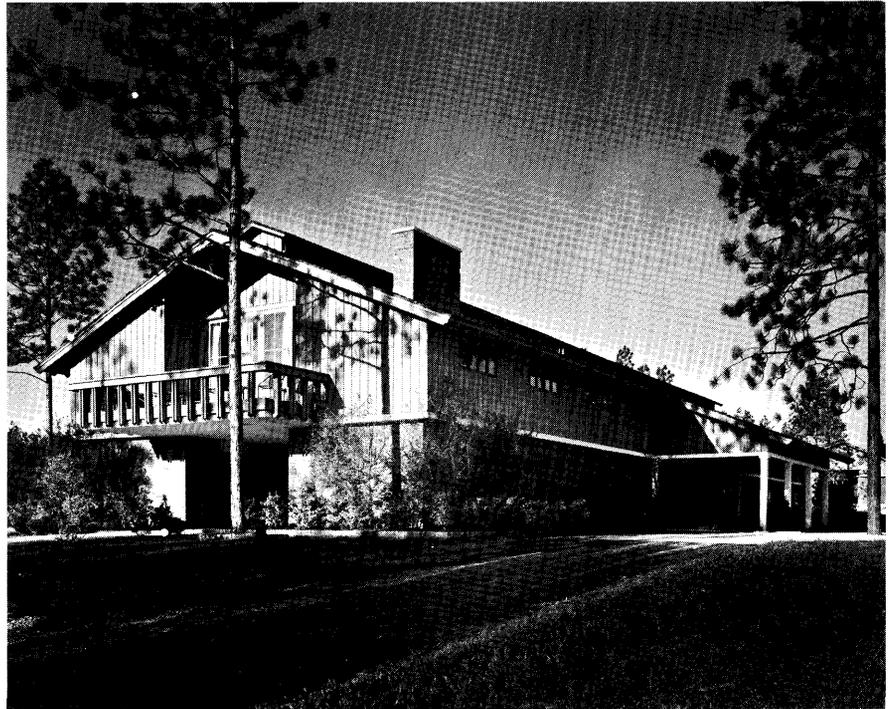


STABLE FOR MR. JOSEPH H. BRYAN, JR., SOUTHERN PINES

AUSTIN-FAULK ASSOCIATES, ARCHITECTS, SOUTHERN PINES

The characteristic elements of the good barn—the long roof slope, the continuous ridge vent, the simple gable, the large areas of unbroken wall, the regularly spaced openings, the up-and-down boarding—have all been used here to good effect, both in the owner's apartment and in his horses' stables.

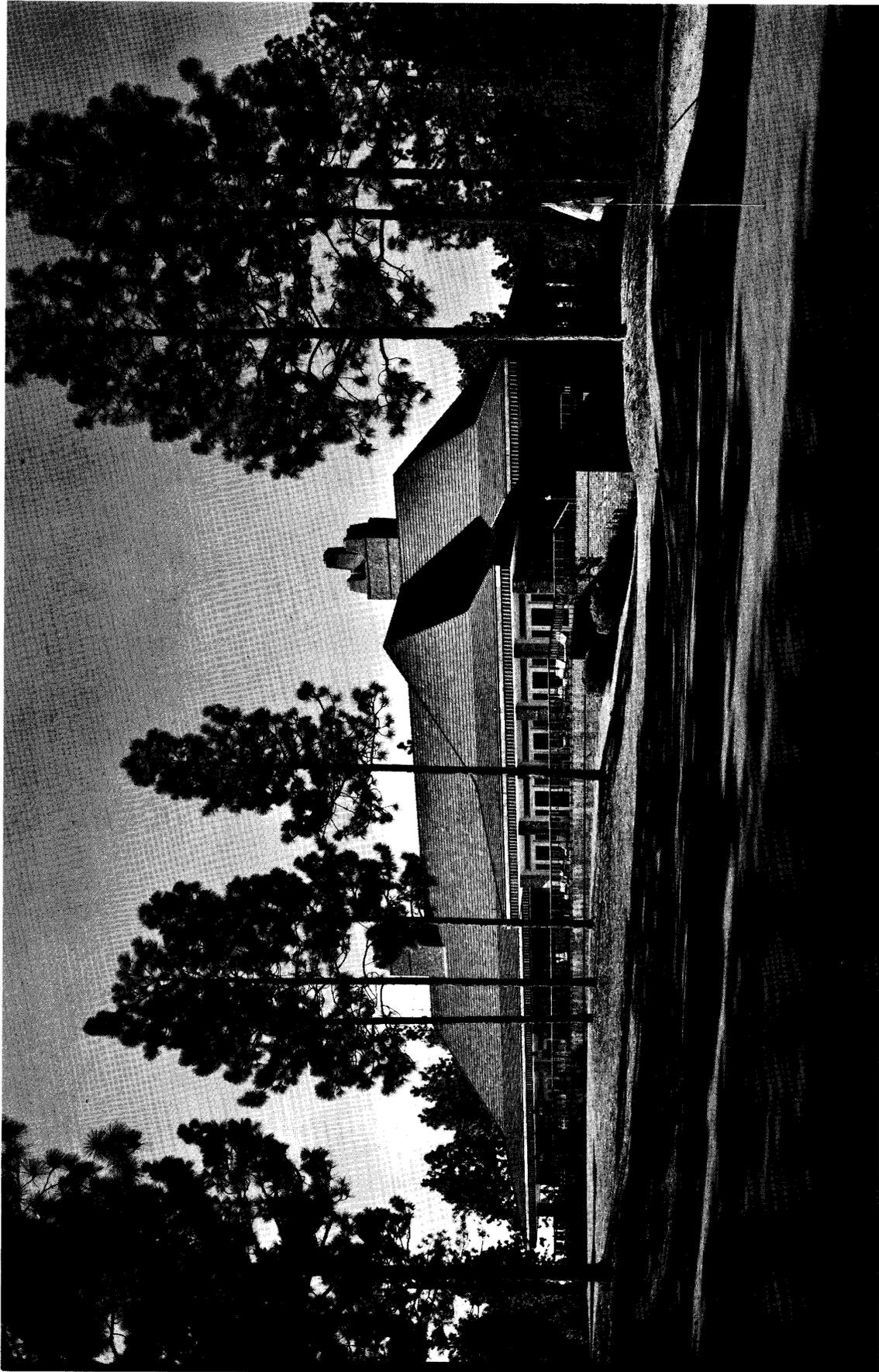
Photographer: Joseph W. Molitor



Shapes and structure are as simple on the inside as on the outside.

Photographer: Joseph W. Molitor





A groomed landscape surrounds this building. Trees are pruned; clipped grass instead of fallen leaves cover the still rolling surface of the land. Like its setting, the building makes a feature of its grooming, still exhibiting in form and materials its affinity to the landscape. A hipped roof allows a completely level eaves line whose evenness is in keeping with the gentle undulating lines of the land and a means of measuring the degree of the ground's rise and fall. The roof's two pitches—low near the eaves and high near the ridge—further mark the clubhouse as a gentle building in a gentle landscape.

Photographer: Joseph W. Molitor

A GENTLE BUILDING IN A GENTLE LANDSCAPE

THE COUNTRY CLUB OF NORTH CAROLINA, PINEHURST, N. C.
AUSTIN-FAULK ASSOCIATES, ARCHITECTS, SOUTHERN PINES

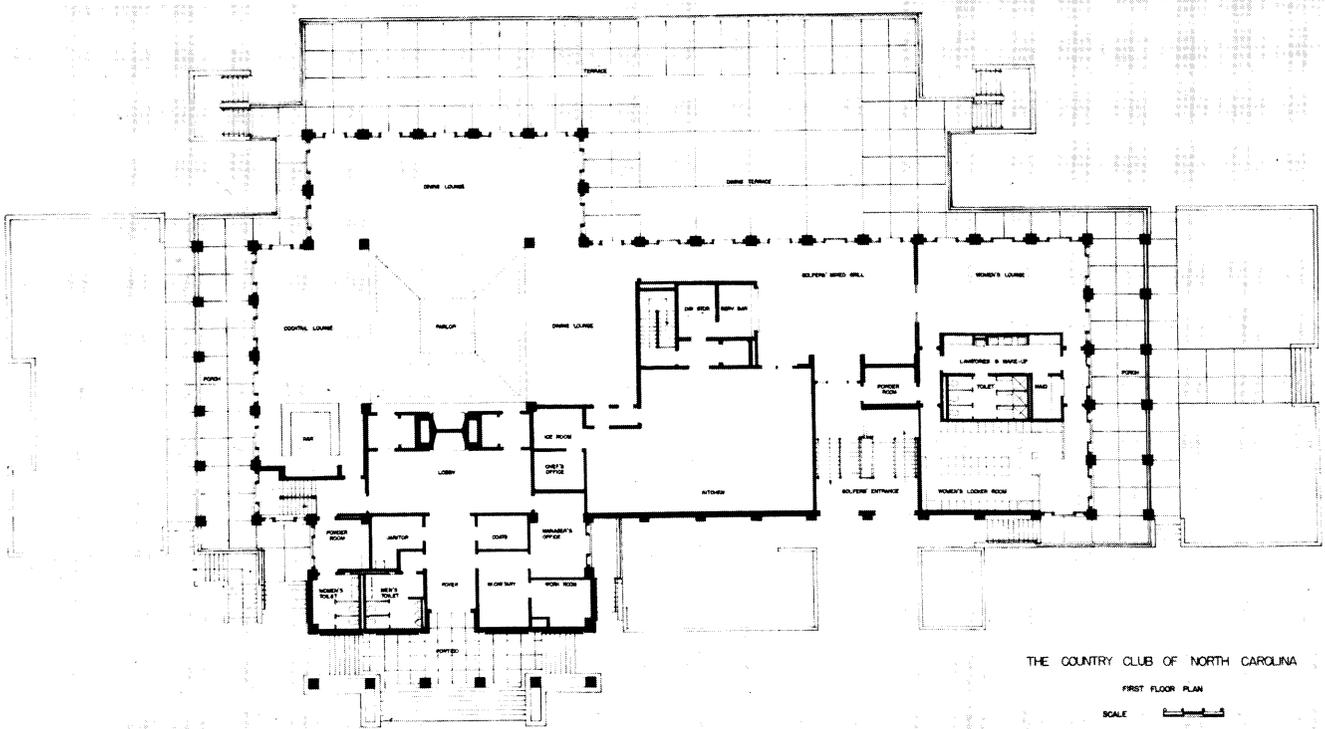
Porches are an integral rather than an added feature. Chimneys are large and simple extensions through the roof of interior features, their climax more in character with the building than are the usual chimney pots.

Photographer: Joseph W. Molitor





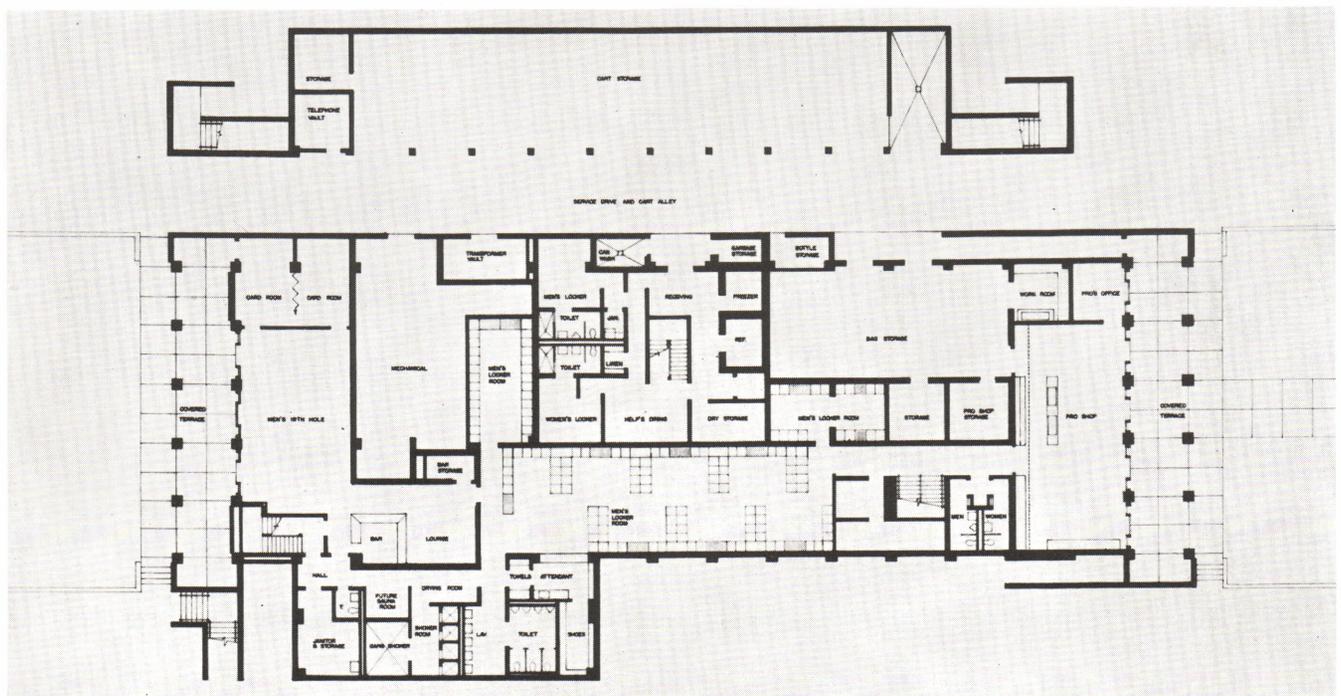
The same fascia that marks the edge of the eaves marks also the edge of the parlor's cornice, and the same slope that marks the upper section of the roof marks also the ceiling above the cornice. Under



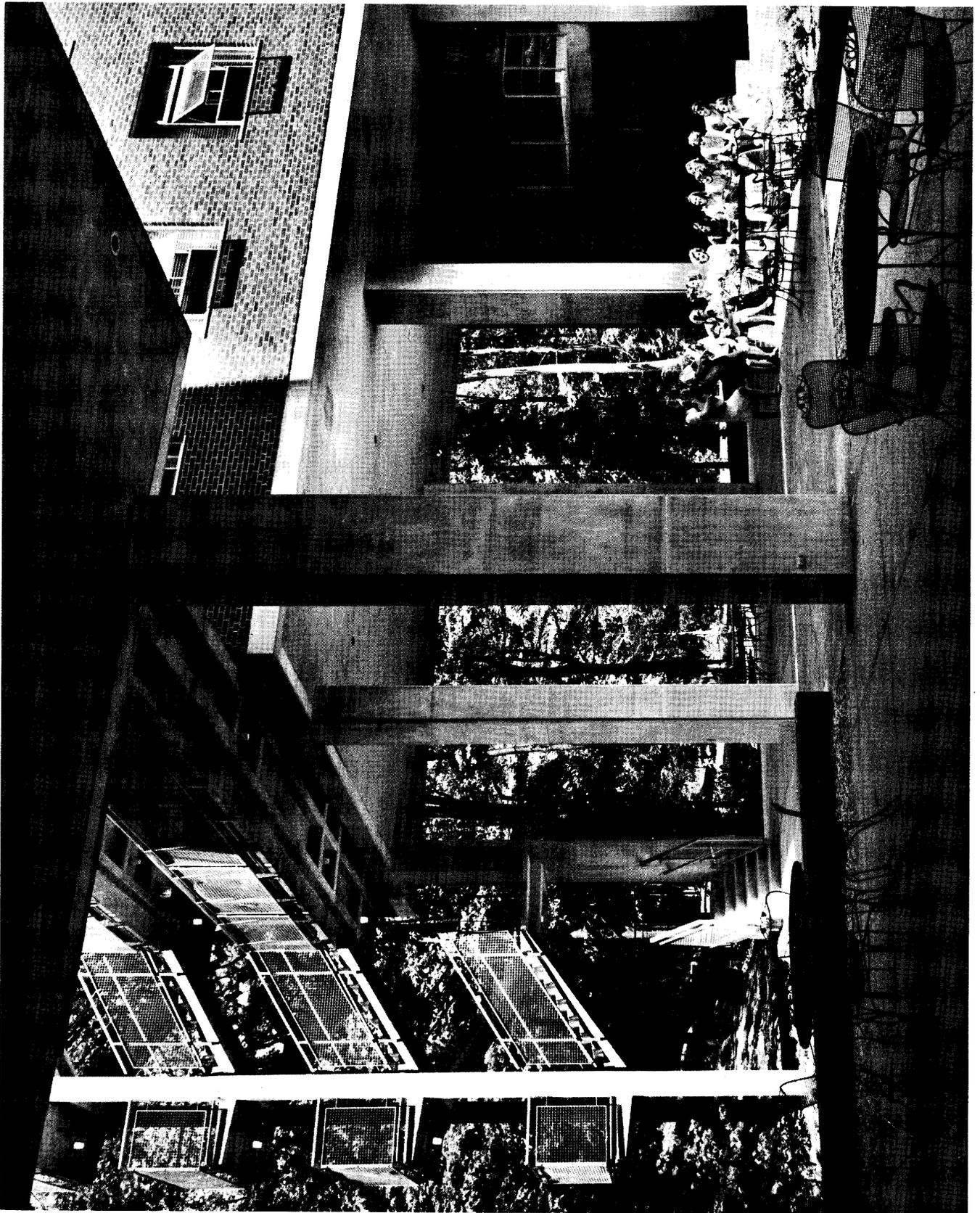


the lower pitch of roof are lounges surrounding the parlor on three sides. From them the parlor borrows space and view and to them it contributes a center distinct with high ceiling and square plan.

Photographer: Joseph W. Molitor



THE GROGAN-REYNOLDS DORMITORIES



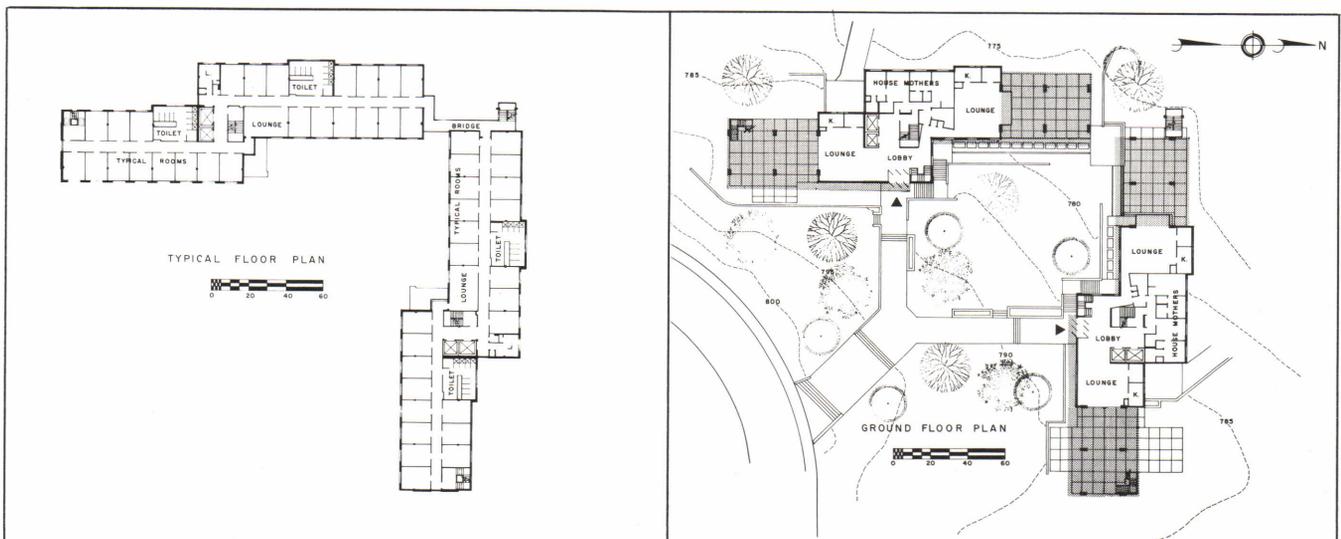
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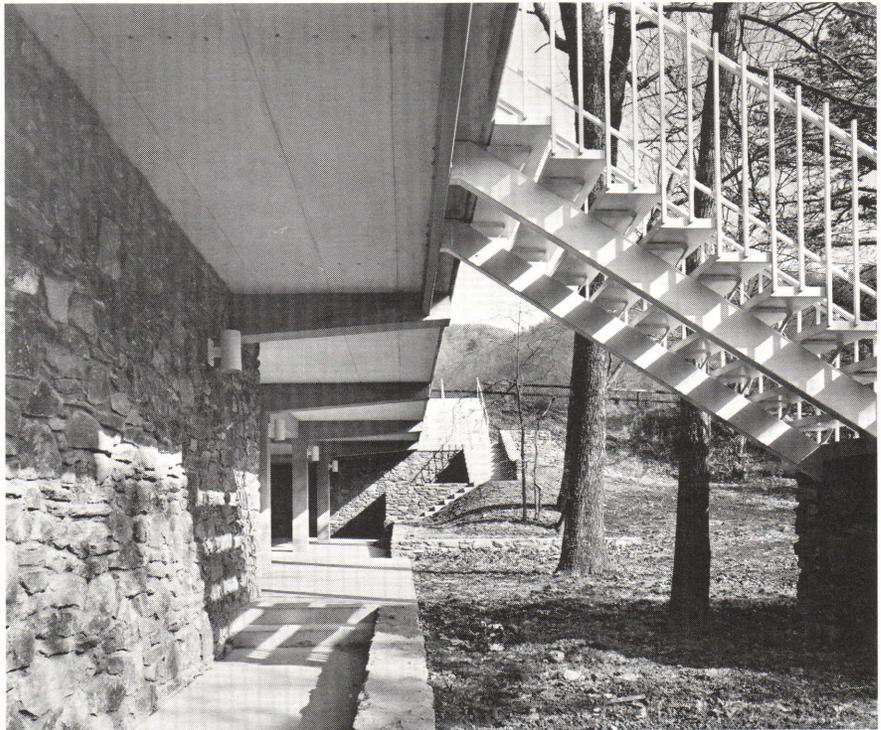
Photographer: Gordon H. Schenck, Jr.

Sometimes small buildings are better than large ones. Sometimes two small buildings can take the place of one large one, as here. Aside from the obvious advantage of fewer residents in each hall, other advantages having to do with the site are strikingly evident. Not only have the natural slopes, trees and ground cover been kept, but no wall has arisen cutting off the landscape on one side from that on the other. Half the ground floor of each building is devoted to terraces open to both sides. Their charm is in allowing one to look from one garden to another and across one terrace to another to the sunlit woods behind.



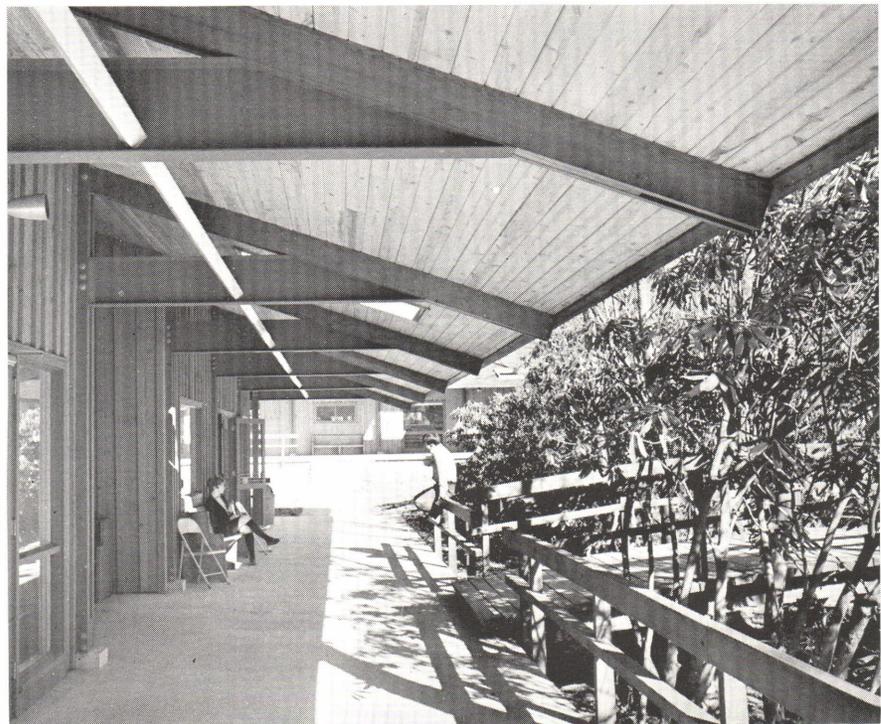


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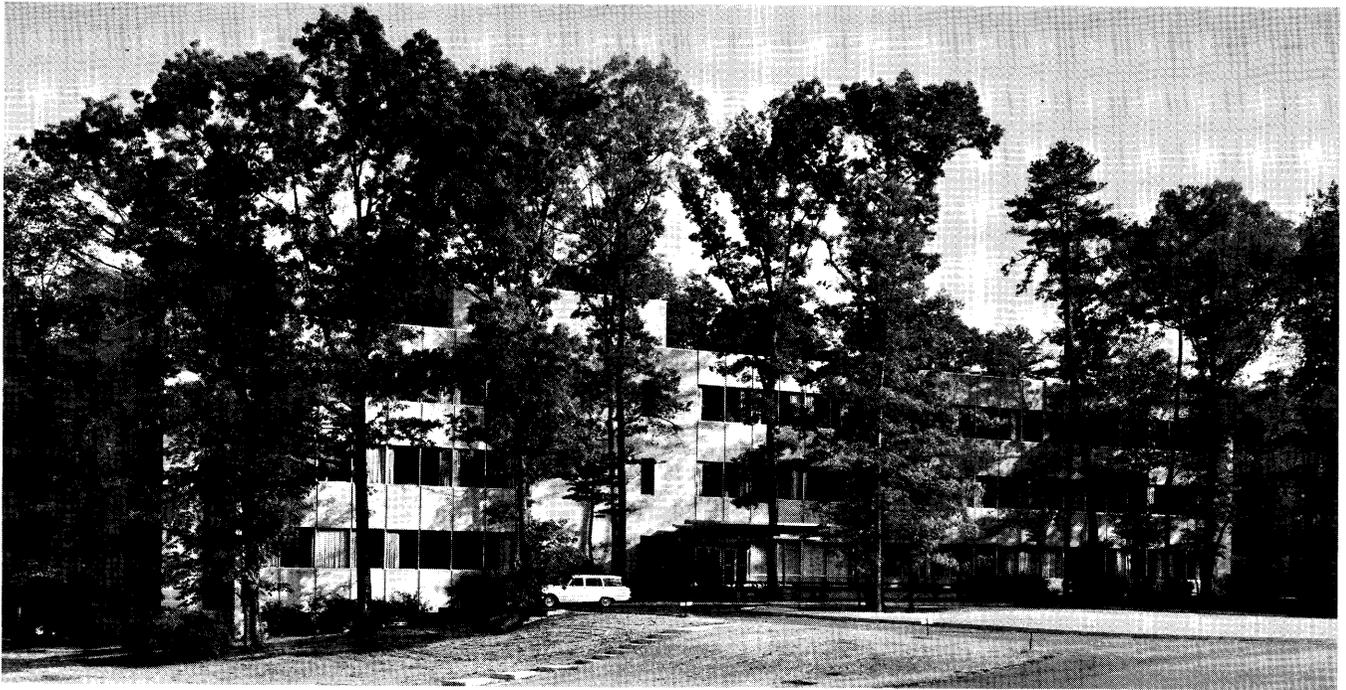
Photographer: Edward L. DuPuy

The automobile service station and post office front on either the road or the parking lot, but inside this commercial center the creek the trees and the natural grades remain.



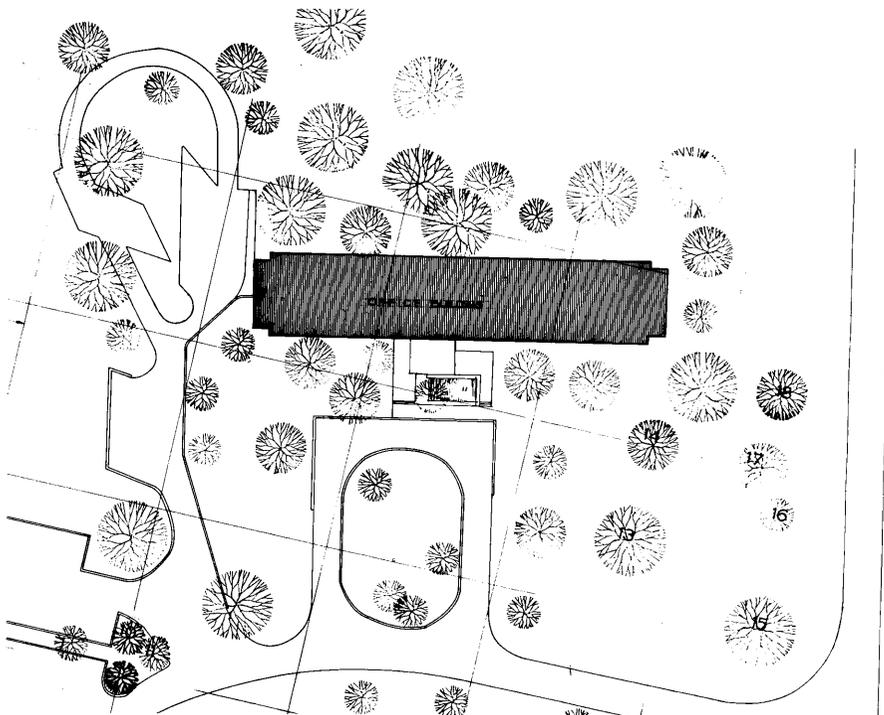
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A CORPORATE OFFICE BUILDING AMONG TREES



Photographer: Rodney McKay Morgan

Trees are sometimes worth protecting. Here the architects have made good use of them. By placing the car park at one side and on a lower level, they have given the trees and building a chance to welcome the visitor.



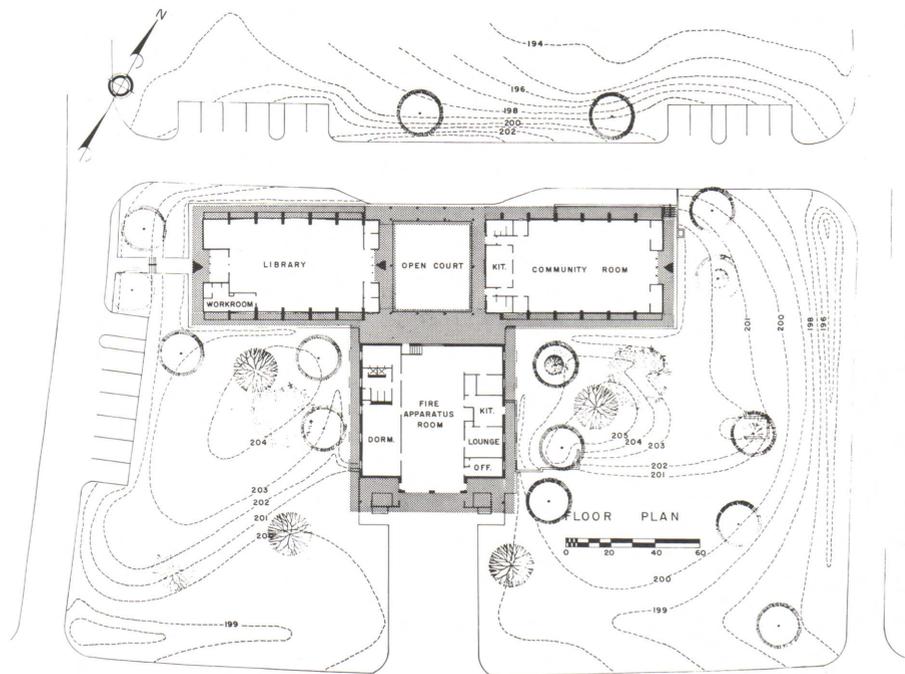
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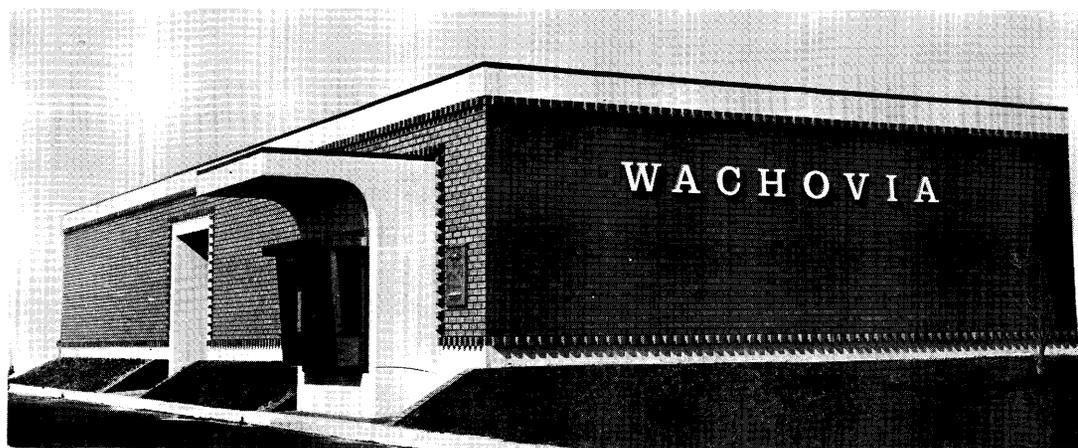
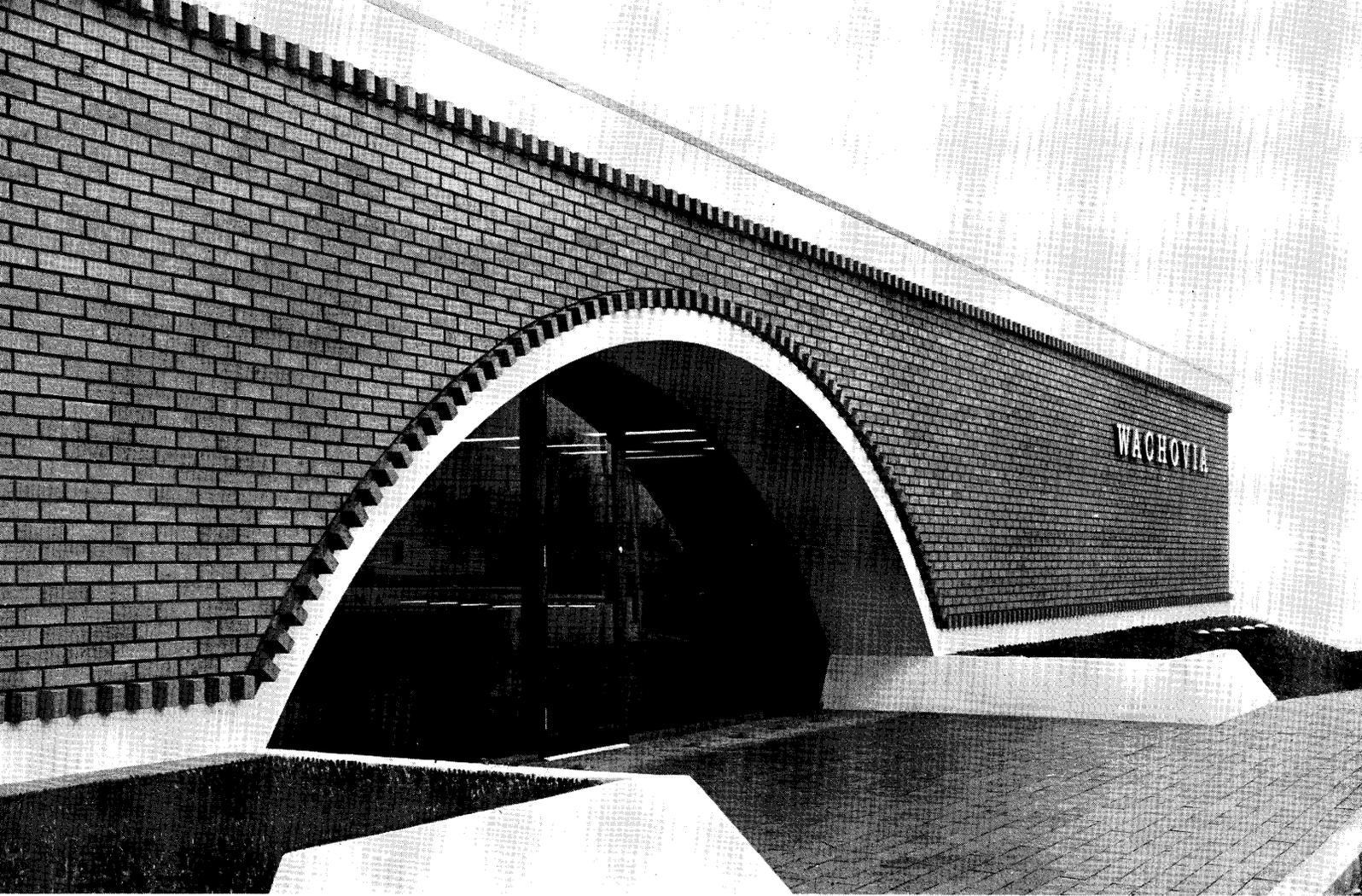
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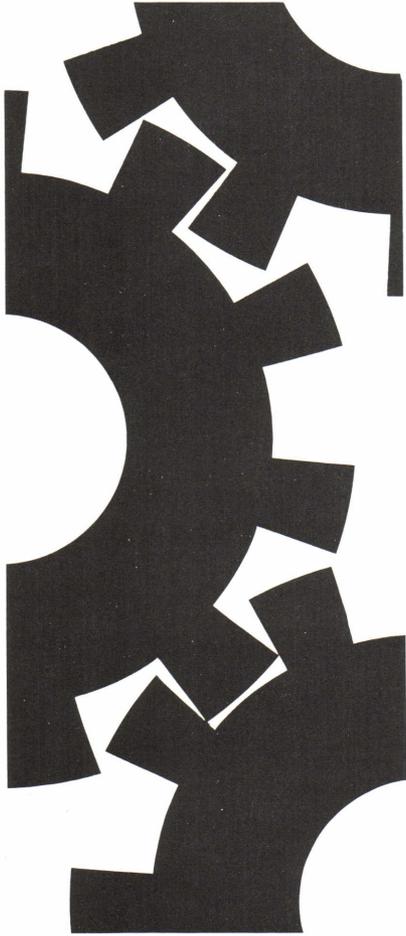
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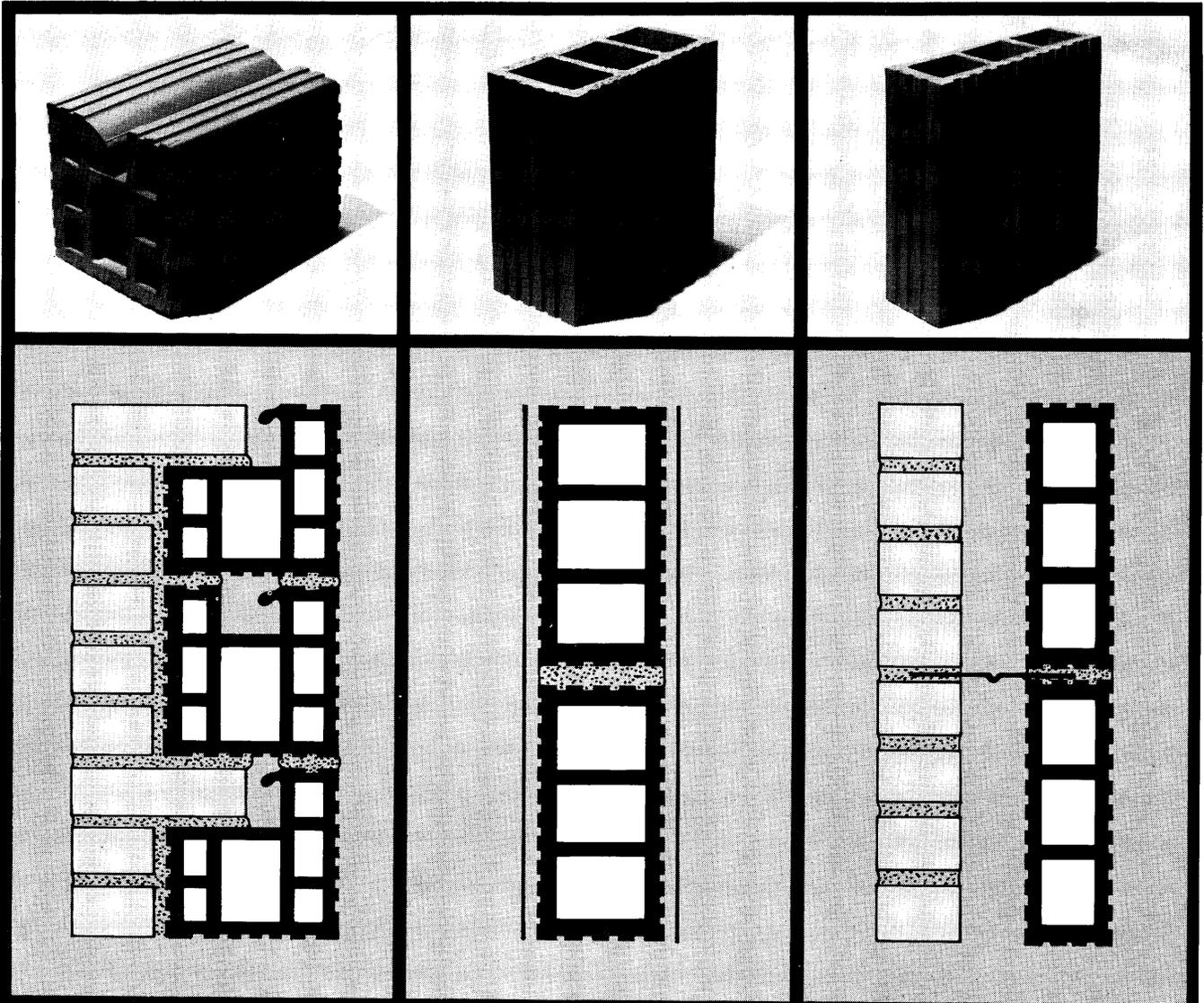


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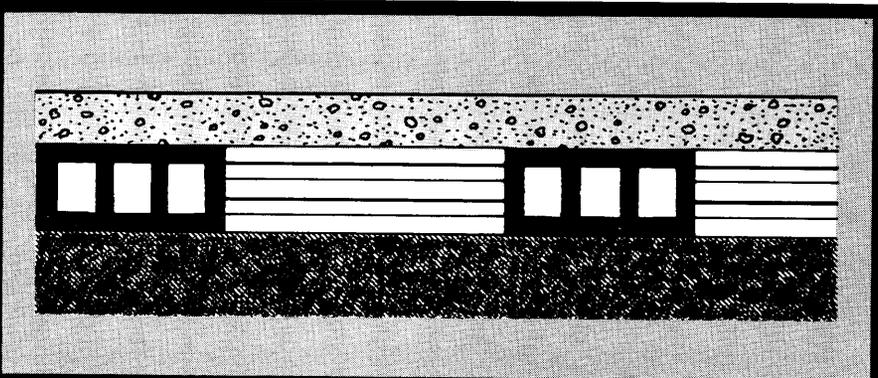
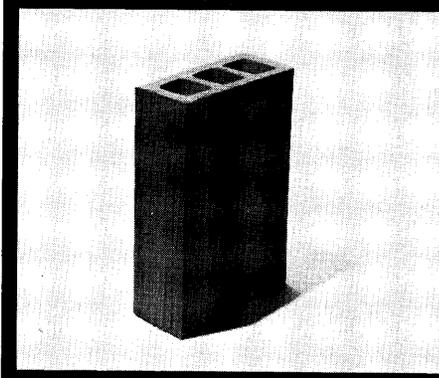
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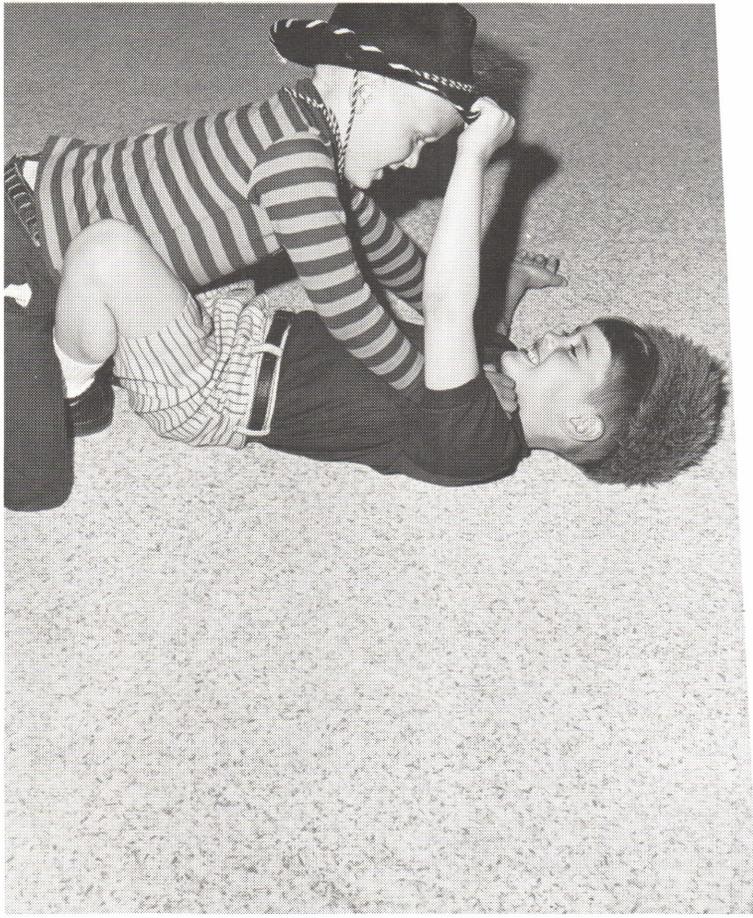
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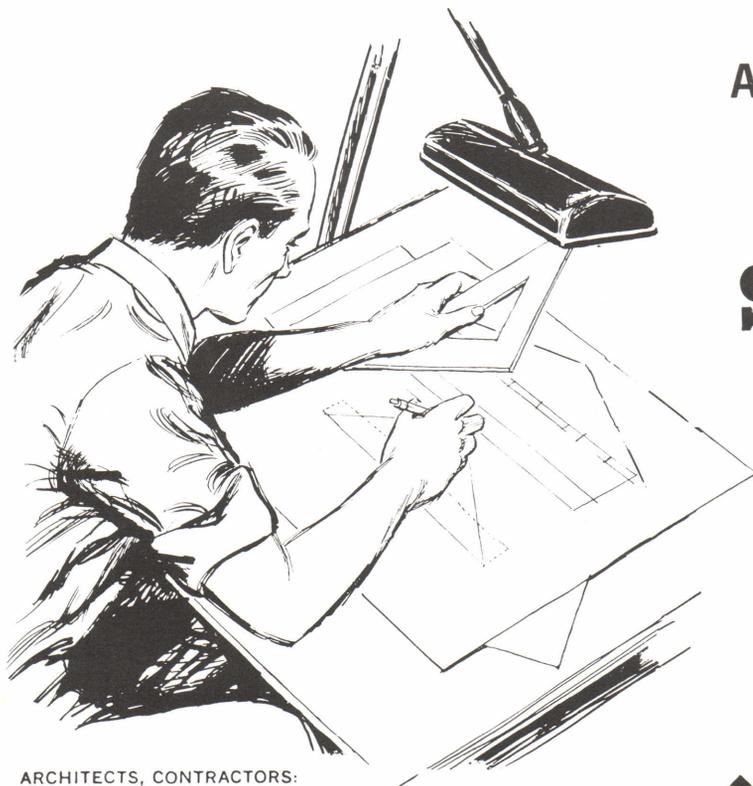
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